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TECHNOLOGY ADOPTION IN UNIVERSITY LIBRARIES IN IMO STATE, NIGERIA

¹UCHE V. ENWEANI, Ph.D,(CLN) ²DEBORAH UZOMA EZEKWIBE

¹⁻² Chukwuemeka Odumegwu Ojukwu University, Anambra State.

Email: uv.enweani@coou.edu.ng & ud.ezekwibe@coou.edu.ng

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ABSTRACT

This investigation explored the integration of technological innovations in academic libraries within Imo State, Nigeria. The study analyzed librarians' comprehension, perspectives, readiness for robotic adoption, anticipated advantages, and corresponding obstacles. A descriptive survey approach was implemented, encompassing 124 library professionals across six institutions. Information gathering employed structured questionnaire instruments, with data interpretation utilizing descriptive statistical techniques .Results demonstrated minimal librarian familiarity with robotic innovations, revealing limited comprehension of operational functions, advantages, and implementation prerequisites. Despite knowledge limitations, participants maintained positive perspectives toward robotics, acknowledging capabilities for enhanced patron experiences, service mechanization, burden alleviation, and operational automation. Substantial enthusiasm for embracing robotic platforms emerged, with most professionals supporting educational initiatives, experimental programs, and regulatory frameworks to enable integration. Primary anticipated advantages encompassed enhanced efficiency, reduced assistance requirements, financial savings, and continuous operational capacity. Numerous implementation obstacles were recognized, including transformation resistance, inadequate technological competencies, deficient preparation, deployment expenses, structural limitations, and vocational security anxieties. The investigation concludes that despite Imo State librarians' demonstrated readiness for robotic innovation adoption, knowledge deficiencies and implementation obstacles require resolution. Recommendations encompass professional enhancement through educational programs and seminars, institutional structural investment, and organized transformation management strategies to improve acceptance and assimilation of robotic innovations in Nigerian academic library environments.

Keywords: Technology adoption, Digital transformation, Information and Communication Technology (ICT), Library Automation, E-resources, Challenges and Opportunities

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Introduction

Organizations are compelled to embrace innovative strategies to achieve their objectives effectively. Similar to numerous developing nations globally, Nigeria confronts significant economic challenges. The country experienced unprecedented post-independence inflation rates of 34.8% in January 2025 (Sowande, 2025). These economic pressures have necessitated organizations to implement cost-effective business practices within diminished budgets. University libraries, fundamental to knowledge creation and distribution, rank among the sectors most severely affected by these financial constraints. As they strive to maintain service provision limitations, implementing despite financial novel approaches and strategies that enhance efficiency becomes essential for advancing their mission (Abayomi et al., 2021).

Emiri (2023) notes that reduced funding to higher education institutions has resulted in substantial reductions to library budgets, compelling academic libraries to explore alternative methods for maintaining relevance and productivity. Information and (ICT) communication technology implementation, particularly robotic technologies, represents a primary innovation under consideration. Robotics, an meraina computer interdisciplinary field science. mechanical engineering, artificial intelligence, and electronics, aims to create intelligent devices capable of performing diverse tasks while occasionally mimicking human actions (Lund et al., 2020). These technologies enhance efficiency, precision, and safety across multiple sectors, including healthcare, manufacturing, and education.

Robot technologies are increasingly utilized within library environments to perform tasks traditionally executed by human personnel. These include robotic arms for material sorting and shelving, automated storage and retrieval systems (ASRS), and service robots providing patron guidance. These systems not only reduce staff workload but also enhance accuracy and operational efficiency. ASRS, for instance, can effectively manage extensive collections, optimize space utilization, and enable rapid resource retrieval. Al-powered robots can additionally support digital content cataloging and management, allowing librarians to focus on patroncentered services such as research support and information literacy instruction (Abayomi, Adenekan, & Abayomi, 2021).

However, successful robotic technology implementation in libraries depends not merely on system availability but also on librarians' attitudes and perceptions toward these technologies. Librarian perception encompasses their understanding of robotic technologies, functionalities, and potential for enhancing library services. According to Afebuameh et al. (2020), awareness enables librarians to evaluate how technologies like automated shelving and robotic assistants can streamline processes and improve user experiences. It also helps them identify challenges including high implementation costs, technical expertise requirements, and ongoing maintenance needs. Librarian understanding develops through training, professional exposure, and institutional technological environments.

Perception relates to librarians' attitudes, opinions, and viewpoints regarding robotic technologies. These beliefs affect their readiness to accept and effectively utilize such technologies. Wisskirchen et al. (2017) describe perceptions as viewpoints concerning benefits like operational efficiency, enhanced user engagement, and optimized workflows. Simultaneously, they acknowledge concerns about technological disruptions, iob displacement, and system failures. While positive perceptions can facilitate technological adoption, negative attitudes may impede progress despite potential advantages. Afebuameh et al. (2020) stress the significance of awareness and perception in evaluating and adopting emerging library technologies.

Although robotics could enhance Nigerian university library operations, implementation remains challenging. Yeboah-Boateng and Essandoh (2014) indicate that many librarians either distrust or feel uncomfortable with robotic systems, primarily due to inadequate ICT competencies or insufficient understanding of their value. This situation demands improved training programs, and increased awareness consistent workshops, initiatives about these technologies' actual benefits. In resource-constrained countries like Nigeria, robotic tools could provide substantial improvements. Nevertheless, limited research has examined librarians' genuine attitudes toward their utilization. Particularly in regions like Imo State, this topic receives minimal attention. This gap precisely justifies the necessity for this research.

Robotic technologies possess transformative potential for library services through enhanced service provision, improved resource optimization, and automation of routine tasks. Despite these benefits, preliminary investigations with professional librarians in Imo State University libraries reveal inadequate understanding and limited enthusiasm for implementing these innovations. This reluctance stems from perceived implementation complexity, inadequate professional development, financial concerns, and doubt regarding robotics' relevance to library practice. Many librarians continue

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questioning the utility and necessity of robotic technologies in their professional activities. Consequently, a significant knowledge gap exists concerning the extent and nature of librarian attitudes toward robotics in library operations. This study therefore seeks to investigate professional librarians' perceptions and awareness levels regarding robotic technology integration in university libraries across Imo State, Nigeria, to identify barriers and inform implementation strategies.

Purpose of the study

The specific objectives are to:

- 1. Investigate librarian perceptions concerning robotic technology adoption in university libraries in Imo State, Nigeria;
- Evaluate the readiness levels among professional librarians to embrace robotic technologies in university libraries in Imo State, Nigeria;
- Determine the perceived advantages of utilizing robotic technologies in university libraries in Imo State, Nigeria.
- 4. Analyze the perceived obstacles concerning robotic technology adoption in university libraries in Imo State, Nigeria.

Research Questions

These research questions directed this investigation:

- 1. What perspectives do librarians hold concerning robotic technology adoption in university libraries in Imo State, Nigeria?
- 2. What readiness levels exist among professionals to embrace robotic technologies in university libraries in Imo State, Nigeria?
- 3. What perceived advantages are associated with robotic technology utilization in university libraries in Imo State, Nigeria?
- 4. What perceived obstacles are linked to robotic technology adoption in university libraries in Imo State, Nigeria?

Literature Review

Librarians' awareness and perception of robotic technologies represent crucial factors influencing the integration of these innovations into library operations. Robotic technologies are fundamentally transforming

library service delivery through developments including automated cataloguing, material sorting, inventory control, and patron assistance. Ali, Naeem, and Bhatti (2020) argue that librarian awareness encompasses more than technical specifications, extending to implementation costs, potential sustained benefits, and requisite technical expertise for utilization. Enhanced awareness enables librarians to make informed decisions that improve service provision, as noted by Sambo et al. (2015). Conversely, limited exposure or insufficient awareness can lead to resistance, misconceptions, and technological innovations reluctance to embrace (Enweani, 2018).

Several elements influence librarian sensitivity to robotic technologies, including professional development, institutional backing, and access to training opportunities (Oyekale & Zubairu, 2023; Enweani, 2019). Through a nationwide study, Abayomi et al. (2021) determined that while librarians demonstrated general sensitivity to artificial intelligence (AI) applications in libraries, they expressed substantial concerns about employment displacement despite recognizing AI's operational findings revealed efficiency. Their considerable awareness mixed with anxiety, highlighting librarians' primary need to develop technological competencies to manage these developments (Enweani & Nwankwo, 2018). Research involving 37 professionals showed that Kwara State librarians possessed moderate awareness levels regarding AI tools like chatbots and Dynamed (Eiriemiokhale & Sulyman, 2023). Conversely, Öyekale and Zubairu (2023) found through structured interviews across 10 Osun State university libraries that 80% of librarians demonstrated knowledge of AI tools, indicating relatively elevated regional awareness levels.

Robotic technology emergence in libraries presents transformative opportunities to automate processes, boost efficiency, and enhance patron services. However, successful adoption and integration depend significantly on librarian perspectives (Amaechi, Enweani, & Eke, 2018). Kim (2017) suggests that librarian viewpoints on robotic systems including automated shelving, cataloging, and user-assistance technologies determine how these tools function within libraries. Librarian perceptions are shaped by prior experiences, training, institutional backing, and technology alignment with patron needs (Yoon et al., 2022). Innovation-oriented librarians often view robotic technologies as solutions for workload reduction and service enhancement (Enweani & Muokebe, 2019). Others remain cautious, expressing concerns about employment displacement, system complexity, and technology implementation expenses. Wood and Evans (2018) noted that these perceptions significantly influence librarian adoption of robotic technologies.

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Nigerian research by Sambo and Oyovwe-Tinuoye (2023) revealed that most certified librarians maintained negative attitudes toward robotic technologies. Despite recognizing potential advantages, concerns persisted regarding employment loss, funding inadequacy, and infrastructure deficiencies (Olarunfemi, Nwankwo. Enweani, & Ogalue, 2020). These results emphasize the necessity for librarians to develop relevant technical competencies to maintain career competitiveness. Contrarily, Isebe (2024) discovered that South-South Nigerian librarians held more positive evaluations of Fourth Industrial Revolution (4IR) technologies. While librarians acknowledged 4IR technology benefits such as automation and efficiency, the study identified significant technical expertise gaps and requirements for targeted training initiatives (Enweani, 2021). Similarly, Oyekale and Zubairu (2023) found that although 80% of Osun State librarians maintained positive AI attitudes, financial and infrastructure limitations constraints hindered widespread implementation. These investigations suggest that while librarians generally accept robotic technologies, implementation remains constrained by fundamental challenges (Urhiewhu, Enweani, & Oladapo, 2021).

Robotic technology integration into libraries represents a transition toward automation and efficiency in information management. Robotic innovations, including automated shelving and robotic assistants, are revolutionizing library operations by streamlining workflows, reducing human error, and enhancing user experiences. Bomble and Dipika (2015) indicate that libraries increasingly adopt robotics to maintain digital age relevance, fulfilling their fundamental knowledge distribution role while incorporating technological advances. Library robotics enables automation of repetitive tasks including cataloging. shelving, and inventory management, allowing librarians to concentrate on specialized responsibilities such as resource curation and patron support. Odevemi (2019) states that robotic technologies contribute to human error elimination, time conservation, and library operation optimization. Additionally, these systems operate continuously, providing round-the-clock services particularly valuable in academic libraries requiring constant information access (Asemi & Asemi, 2018).

Robotic systems also enhance patron engagement and accessibility. Robotic assistants can guide users, support navigation, and respond to basic inquiries, proving especially beneficial in large libraries or for individuals with disabilities (Cox et al., 2019). These solutions' interactive nature appeals to technology-oriented users while delivering inclusive service experiences. Kim (2017) adds that libraries adopting robotic technologies are often perceived as progressive institutions, generating reputational benefits and international recognition. This

collaboration and positions libraries to facilitates technological incorporate emerging developments. Therefore. robotic system implementation helps libraries, making them more efficient, modernize inclusive, and capable of addressing digital age requirements.

Despite numerous advantages, robotic technology deployment in libraries encounters various obstacles that limit broader application. A primary challenge involves librarian lack of awareness and technical proficiency regarding robotic systems. This frequently creates resistance and uncertainty surrounding technology implementation (Emiri, 2023). Financial constraints also deployment, significantly impact as purchasing, maintaining, and training staff to operate robotic equipment often exceeds institutional budgets. Tait and Pierson (2022) indicate that specialized training is essential for effective robotic technology utilization, yet many librarians lack foundational knowledge to operate these systems confidently. Kaushal and Yadav (2022) stress the importance of addressing privacy concerns, particularly regarding Al-driven chatbot usage in library services, suggesting that ethical considerations should accompany technology integration.

Employment insecurity represents another significant concern regarding robotic technology incorporation in libraries. Korinek and Stiglitz (2017) suggest that automation technologies like AI and robotics may displace library personnel, a perspective supported by the World Bank (2016), which warns that developing nation automation could cause job losses. Yusuf et al. (2022) report that librarians frequently struggle to integrate AI tools with traditional library practices, creating discomfort and disrupting established workflows. Liau (2019) identifies robotic system technological limitations, including restricted capabilities, process modification requirements, and operational failure susceptibility. Furthermore, Oghenetega et al. (2014) argue that inadequate infrastructure, unreliable electricity, poor maintenance culture, and insufficiently trained compound challenges. personnel these These constraints emphasize the importance of strategic planning, capacity development, and infrastructure investment to ensure robotic technologies complement rather than disrupt existing library operations. While robotic technologies possess potential to transform library operations and service delivery, their adoption confronts numerous obstacles. Awareness, perceptions, financial limitations, technical proficiency, and infrastructural constraints significantly impact technology acceptance.

Methodology

This study used a descriptive research approach to investigate librarians' awareness and perspectives of robotic technology uptake in university libraries in Imo State, Nigeria. This methodology was chosen for its capacity to deliver unbiased and thorough data, establishing a solid foundation for informed decisionmaking (Odede et al., 2023). The target demographic consisted of 124 librarians from several universities, including Imo State University, Owerri, and the Federal University of Technology, Owerri A total enumeration sample technique was used since the population size was manageable, making sampling unnecessary. The major data gathering instrument was a self-structured questionnaire with six sections. Sections (A) through (F) discussed demographic information, librarian awareness. perceptions, adoption patterns, obstacles, and perceived benefits of robotic technologies. To achieve a high response rate, the researcher personally delivered the questionnaires and collected completed forms immediately. Data were analyzed using descriptive statistics such as frequencies, percentages, and arithmetic means. A mean score of 2.50 was used as the criterion for interpretation, with any score less than 2.49 being eliminated from the study.

Result and Discussion of Findings

Table 1: School of the Respondents

	Freque	Percentag
School of the Respondents	ncy	e (%)
Imo State University, Owerri	44	50.00
Federal University of technology,		
Owerrin	15	17.05
Maranathan University, Mgbidi	9	10.23
Kingsley Ozumba Mbadiwe		
University, (KOMU)	7	7.95
University of Agriculture,		
Umuagwo	7	7.95
Hezekiah University, Umudi		
(UNIHEZ)	6	6.82
Total	88	100.00

Table 1 shows the distribution of responses according to their respective institutions. The data show that Imo State University, Abraka, has the most respondents, 44 (50.00%), followed by the Federal University of technology, Owerri, with 15 (17.05%). The Maranathan University, Mgbidi, had 9 respondents (10.23%), while the Kingsley Ozumba Mbadiwe University, (KOMU), and University of Agriculture, Umuagwo, both had 7 (7.95%). Meanwhile, Hezekiah University, Umudi (UNIHEZ), had the lowest representation, with only 6 respondent (6.82%). The distribution shows a strong presence of respondent from Imo State University, Abraka.

Answering of the Research Questions

Research Question 1: What are the perceptions of librarians towards the adoption of robotic technologies in university libraries in Imo State, Nigeria?

Table 2: Perceptions of Librarians towards theAdoption of Robotic Technologies in UniversityLibraries

				S	
Statement	SA	Α	D	Α	Ā
I believe robotic technologies will improve the user experience in					
university libraries I am certain robotic technologies	35	29	13	11	3.00
can assist in bridging gaps in resource accessibility. It is evident robotic technologies are essential for modernizing library	41	15	20	12	2.97
operations. It is evident robotic technologies can enhance collaboration among	28	36	14	10	2.93
university libraries.	31	27	22	8	2.92
enhance library service delivery I am certain robotic technologies will reduce the workload for	23	44	11	10	2.91
librarians. I am convinced robotic technologies will make library operations more	28	32	20	8	2.91
efficient I am confident that robotic technologies can support innovative	25	35	19	9	2.86
library services I am sure robotic technologies will	19	44	13	12	2.80
positively transform librarianship I am convinced the adoption of robotic technologies is necessary for staying competitive in the digital	23	25	25	15	2.64
age.	11	9	11	57	1.70
Average Mean					2.76
Criterion Mean					

Table 2 shows that the average mean of 2.76 is greater than the criterion mean of 2.50, showing that librarians in university libraries in Imo State, Nigeria, have a generally positive attitude toward the deployment of robotic technologies. Librarians believe that robotic technology will enhance the user experience in university libraries (\bar{x} = 3.00), bridge resource accessibility gaps (\bar{x} = 2.97), and modernize library operations (\bar{x} = 2.93). They also agree that robotic technologies can improve library service delivery (\bar{x} = 2.91), reduce librarian burden (\bar{x} = 2.91), and promote collaboration across university libraries (\bar{x} = 2.92). Robotic technologies are perceived as capable of enabling novel library services (\bar{x} = 2.80) and improving

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efficiency ($\bar{x} = 2.86$). However, faith in robotic technology altering librarianship ($\bar{x} = 2.64$) is slightly lower, and belief that robotic technologies are required for staying competitive in the digital age ($\bar{x} = 1.70$) is modest.

Research Question 2: What is the readiness levels among professional librarians to embrace robotic technologies in university libraries in Imo State, Nigeria?

Table 3: Level of Willingness among Certifiedlibrarians to Adopt Robotic Technologies inUniversity Libraries

				Ver		
Statemants	Very High	Hig h Lev	Lo w Lev	y Lo w Lev	÷	
I will support policies	Levei	CI	CI	CI		
promoting the adoption of robotic technologies in your library I will embrace robotic technologies as a means to enhance library service	37	28	14	9	3.06	
delivery	33	25	20	10	2.92	
I am willing to encourage library users to utilize robotic technologies	34	24	18	12	2.91	
I am interested in participating in pilot projects involving						
robotic technologies I am willing to learn how to use robotic technologies for	28	32	17	11	2.88	
library operations I am willing to attend training sessions on robotic	33	21	22	12	2.85	
technologies	26	33	19	10	2.85	
I fully support the integration of robotic technologies in my library	30	27	18	13	2.84	
I will be open to be open to experimenting with robotic						
technologies in your library I am willing to invest time in	30	29	13	16	2.83	
for using robotic technologies I am prepared to adapt my workflow to incorporate	23	30	18	17	2.67	
robotic technologies	25	27	15	21	2.64	
Average Mean						
Criterion Mean						

The data in Table 3 demonstrate that the average mean of 2.84 is greater than the criterion mean of 2.50, indicating that qualified librarians in university libraries in Imo State, Nigeria, are eager to employ robotic technologies. Librarians are most likely to support policies encouraging robotic technologies ($\bar{x} = 3.06$) and adopt them to improve library service delivery ($\bar{x} = 2.92$).

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They are willing to encourage library customers to employ robotic technologies ($\bar{x} = 2.91$), participate in pilot projects ($\bar{x} = 2.88$), and attend training sessions ($\bar{x} = 2.85$). They are eager to learn how to use robotic technologies ($\bar{x} = 2.85$), support their integration in libraries ($\bar{x} = 2.84$), and experiment with their implementation ($\bar{x} = 2.83$). However, there is slightly lesser desire to adjust workflow for robotic technology ($\bar{x} = 2.64$) and invest time in skill learning ($\bar{x} = 2.67$).

Research Question 3: What are the perceived benefits associated with the use of robotic technologies in university libraries in Imo State, Nigeria?

Table 4: Perceived Benefits Associated with the Use of Robotic Technologies in University Libraries

				S	
Statements	SA	Α	D	Α	Ā
Robotic technologies can improve					
library service delivery	41	28	12	7	3.17
Robotic technologies can provide					
quicker responses to user inquiries	29	46	6	7	3.10
Robotic technologies can increase	~~	~~	4.0	~	
operational efficiency in libraries	36	33	10	9	3.09
Robotic technologies as a means to	40	07	0	10	2.07
Bebetie technologies con reduce	40	21	0	13	3.07
errors in cataloging and sorting	37	30	11	10	3.07
robotic technologies can reduce costs	57	50		10	5.07
associated with manual work	34	30	14	10	3 00
Robotic technologies as beneficial for	0.				0.00
saving time in library operations?	33	33	9	13	2.98
obotic technologies can facilitate 24/7					
library service delivery	36	23	15	14	2.92
Robotic technologies can enhance					
resource accessibility for users	32	28	16	12	2.91
robotic technologies can assist in					
preserving fragile or rare materials	30	33	11	14	2.90
Average Mean					3.02
Criterion Mean					2 50

The data in Table 4 show that the average mean score of 3.02 is greater than the criterion mean of 2.50, showing that librarians in university libraries in Imo State, Nigeria, see significant benefits from using robotic technologies. The top benefits are improved library service delivery ($\bar{x} = 3.17$), faster responses to customer inquiries ($\bar{x} = 3.09$), and automation of repetitive operations ($\bar{x} = 3.07$). Robotic technology can improve cataloging and sorting accuracy ($\bar{x} = 3.07$) and save time in library operations ($\bar{x} = 2.98$). Other significant benefits include cost reduction ($\bar{x} = 3.00$), improved resource accessibility ($\bar{x} = 2.91$), 24/7 service delivery ($\bar{x} = 2.90$).

Research Question 4: What are the perceived challenges associated with adoption of robotic technologies in university libraries in Imo State, Nigeria?

Table 5: Perceived Challenges Associated withAdoption of Robotic Technologies in UniversityLibraries

	S			S	
Statements	Α	Α	D	Α	Ā
resistance to change as a					
challenge to integrating robotic	2	4			
technologies	9	6	6	7	3.10
lack of ICT skills among librarians					
hinders the adoption of robotic	3	3	1	1	
technologies	7	0	1	0	3.07
insufficient training opportunities					
affect awareness of robotic	3	2	1	1	
technologies	5	9	3	1	3.00
technological phobia influences					
perceptions of robotic	3	3		1	
technologies	3	3	9	3	2.98
Cost of robotic technologies is a	2	4	1	1	
major challenge for libraries	3	4	1	0	2.91
absence of funding as a barrier to	2	3	1		
adopting robotic technologies	5	5	9	9	2.86
Deficiency of technical support					
discourages the use of robotic	2	3	1	1	
technologies	6	3	9	0	2.85
inadequate infrastructure as a					
barrier to implementing robotic	3	2	1	1	
technologies	0	7	8	3	2.84
concerns about job displacement					
affect librarians' perception of	3	2	1	1	
robotic technologies	0	9	3	6	2.83
Cultural or institutional resistance					
as a challenge to robotic	2	2	1	2	
technology awareness?	5	7	5	1	2.64
Average Mean				2.91	
Criterion Mean					2.50

The data in Table 5 reveal that the average mean score of 2.91 is higher than the criterion mean of 2.50, indicating that librarians in university libraries in Imo State, Nigeria, see considerable hurdles in implementing robotic technologies. The main obstacles for librarians include aversion to change ($\bar{x} = 3.10$), lack of ICT skills ($\bar{x} = 3.07$), and limited training opportunities ($\bar{x} = 3.00$). Key impediments to robotics include their high cost ($\bar{x} = 2.91$), lack of finance ($\bar{x} = 2.86$), inadequate infrastructure ($\bar{x} = 2.84$), and job displacement worries ($\bar{x} = 2.83$). Adoption is further discouraged by technological fear ($\bar{x} = 2.98$) and a lack of technical help ($\bar{x} = 2.85$). Cultural and institutional resistance ($\bar{x} = 2.64$) also impedes awareness and implementation. These findings highlight the financial, technical, and psychological barriers that need to be addressed for the successful adoption of robotic technologies in university libraries

Discussion of Findings

Readiness Levels for Robotic Technology Adoption

The investigation revealed that librarians demonstrated considerable readiness to implement robotic technologies. Numerous librarians expressed support for policies promoting robotics utilization in libraries and showed enthusiasm for encouraging patron engagement with these technologies (Enweani & Eke, 2019). They demonstrated willingness to engage in experimental programs, participate in professional development adapt operational procedures sessions, and to accommodate robotic innovations. This readiness aligns with Ajani et al. (2022) findings, which indicated that librarians typically show enthusiasm for implementing robotics to enhance service provision. Okuonghae and Tunmibi (2023) found that Nigerian librarians eagerly embrace robotic integration, driven by aspirations to improve library services and operational effectiveness (Igbokwe, Mbagwu, & Enweani, 2019).

Anticipated Advantages of Robotic Technologies

Librarians recognize numerous benefits of robotic technologies, including enhanced service provision, accelerated patron response capabilities, and increased operational effectiveness. They also perceive automation of routine processes, such as classification, as a significant advantage, leading to temporal and financial savings (Enweani & Muokebe, 2019). Additionally, robotic technologies are viewed as enhancing resource accessibility, facilitating continuous service availability, and protecting delicate materials. These benefits correspond with Ajani et al. (2023) discoveries, which found that librarians perceived robotics as essential for task automation and library productivity enhancement. Similarly, Esoswo and Ishioma (2023) indicated that robotic technologies can facilitate uninterrupted service provision, streamline workflows, and minimize operational expenses (Enweani, Enem, & Igbokwe, 2019).

Identified Obstacles in Robotic Technology Implementation

Librarians identified multiple barriers to robotic transformation technology utilization. including resistance. insufficient ICT competencies. and inadequate professional development. Substantial implementation expenses, restricted funding, and

deficient infrastructure create considerable financial obstacles (Enweani, 2019). Additional concerns encompass iob displacement, technological apprehension, insufficient technical assistance, and cultural resistance to innovation. These challenges correspond with Okuonghae and Tunmibi (2023) findings, which identified change resistance and skill deficiencies as primary robotics adoption barriers. Eiriemiokhale and Sulyman (2023) similarly noted that financial limitations and inadequate technical support represented significant obstacles (Muokebe & Enweani, 2019). These discoveries suggest that addressing these challenges is essential for successful robotic technology integration in university libraries (Enweani, 2023).

Conclusion

This investigation demonstrates that although university librarians in Imo State, Nigeria, display favorable attitudes and substantial readiness to implement robotic technologies, their awareness and technical comprehension remain constrained (Enweani, 2018). Most librarians lack comprehensive understanding of robotics applications in library operations, including specific functionalities, advantages, and implementation obstacles. Nevertheless, many recognize that robotic technologies can improve patron experiences, optimize service provision, and minimize workloads (Enweani & Nwankwo, 2018). Their enthusiasm manifests through policy support and training participation willingness. However, substantial obstacles including transformation resistance, restricted ICT competencies, insufficient professional development. elevated costs. and employment displacement concerns impede successful implementation (Amaechi, Enweani, & Eke, 2018). These discoveries have extensive implications for academic libraries globally, particularly in developing regions experiencing comparable economic and infrastructural constraints. Addressing awareness deficiencies, financial limitations, and psychological resistance is crucial for libraries worldwide to utilize robotic technologies in advancing contemporary, efficient, and inclusive library services (Enweani, 2023).

Recommendations

Based on these findings, the following recommendations are proposed to facilitate robotic technology implementation in university libraries across Imo State:

1. Professional Development: Academic libraries should establish continuous training initiatives, educational workshops, and conferences emphasizing robotic technologies. These should demonstrate practical implementations, advantages, and emerging developments to provide librarians with essential competencies (Enweani, 2019).

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- 2. Infrastructure and Financial Support: University leadership and governmental bodies should invest in robotics infrastructure and provide financial backing. International partnerships and funding opportunities can also be utilized to expand implementation (Olarunfemi, Nwankwo, Enweani, & Ogalue, 2020).
- 3. Experimental Programs and Collaborations: Libraries should collaborate with technology companies, research organizations, and international library consortiums to execute pilot initiatives, facilitating hands-on learning and knowledge exchange (Urhiewhu, Enweani, & Oladapo, 2021).
- 4. Technical Competency Enhancement: Curricular modifications and professional advancement programs should emphasize technical abilities concerning robotics, automation, and Al incorporation in library studies (Enweani, 2021).
- 5. Transformation Management Approaches: Libraries should implement international best practices for managing technological transitions, addressing personnel concerns, encouraging transparent communication, and cultivating innovation-oriented cultures (Enweani & Muokebe, 2019).
- 6. Policy Development: Decision-makers should champion evidence-based approaches that advance ethical and sustainable robotics integration in libraries, emphasizing sustained service enhancement and personnel skill advancement (Igbokwe, Mbagwu, & Enweani, 2019).

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