



Contribution of AI Integration for Inclusive Service Delivery in Selected Academic Libraries in Nairobi County, Kenya

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Abstract

Artificial intelligence (AI) is changing traditional ways of usage, operations and service provision in the academic libraries. More and more academic libraries are leveraging on its potential to modernize library service delivery. However, integration of AI applications to improve service delivery in academic libraries in Kenya has not gone far enough, it is still at the initial exploration stages. This research was thus considered to address this gap by examining the contribution of AI Integration for Inclusive Service Delivery in selected academic libraries in Nairobi County, Kenya. A mixed methodology research design was used for this study. The target population was 73 participants made up of 71 librarians and 2 systems librarians selected from the two university libraries within Nairobi County. A census method was used for the sampling of all 73 librarians, while purposive sampling was used for the 2 systems librarians who were considered as key informants. Data were collected through questionnaires and interview guides. The quantitative data was analyzed through the use of descriptive statistics in SPSS. The results showed a statistically significant positive relationship between AI integration and inclusive service delivery ($r = .615, p < .001$). The study concluded that the integration of AI in library services has positively impacted the service delivery, making the services faster, accurate, and easily accessible to all kind of users. In addition, the integration of AI is positively and significantly but moderately contributing towards inclusive services, especially for visually impaired users, distant learners, and those with linguistic diversities through the use of technology like text-to-speech, screen readers, and translators. The study suggested that university library managers adopt intentional AI integration strategies, invest in proper infrastructure and training programs, and have specific AI policies for libraries.

Keywords: *Academic Libraries, Artificial Intelligence, AI integration, Inclusive Service Delivery.*

Introduction

Academic libraries have never been strangers to technological change. As universities have changed, libraries have also changed ways in which they organize information and deliver services to their users. The shift from traditional manual processes to integrated library management systems, online public access catalogues (OPACs), digital libraries, institutional repositories and remote-access platforms like My Library on Finger Tips (MyLOFT), EZproxy among others has gradually changed the meaning of library service delivery. What was once largely dependent on users physically visiting the library and librarians manually performing many routine tasks can now be accessed and managed through increasingly sophisticated digital systems. The emergence of artificial intelligence (AI) brings another phase in this ongoing transformation. Unlike the older technologies that mainly automated existing processes AI does more than just automate or digitize. According to IFLA (2020), AI is not just an emerging technology, it is a technology that has the ability to transform some of the fundamental library functions. It brings in systems that can make academic library services more accessible, responsive, and inclusive to users with diverse information needs. It has created new opportunities for academic libraries especially in providing more flexible forms of information access and user support. Okuonghae (2026), in a review of AI-powered accessibility initiatives in academic libraries, examined technologies and innovative services designed to support blind and visually impaired (BVI) users. The review indicated that AI-powered accessibility technologies have the potential to promote more inclusive library services by addressing accessibility barriers faced by BVI users. However, the review found that AI implementation is still uneven, with gaps in user experience, inclusive design, institutional readiness, and policies.

Evidence from different parts of the world indicate that AI is no longer a future possibility in libraries as most libraries are already exploring and implementing AI-enabled solutions. The Clarivate Pulse of the Library 2024 report, for instance, indicated that more than 60% of libraries were exploring or implementing AI (Clarivate, 2024). Similarly, Tshabalala and Dube (2024), observed that AI technologies were increasingly being embraced in libraries to improve access to information, streamline service processes and respond to changing user needs in libraries. Further reinforcing this, Okwu, Oyighan and



Oladokun (2024) emphasized the need for AI applications implemented in libraries to align with library values of inclusivity and accessibility. These observations suggest that the potential of AI to promote inclusive library service delivery is significant. However, this potential can only be meaningful if AI is deliberately integrated into services in ways that respond to the diverse needs of library users.

This development can also be seen in specific academic library applications. For example, Zayed University Library in Dubai developed an AI assistant known as “Aisha” to provide reference and support services to students and faculty beyond regular library hours. The system was subsequently connected to different information sources, including the library catalogue and institutional repository, thereby expanding the assistance it could provide (Lappalainen & Narayanan, 2023). Such developments illustrate how AI can become an additional interface through which users interact with library resources and services remotely.

However, the development of AI-supported library services has not occurred at the same pace everywhere. While libraries in technologically advanced environments have made considerable progress in experimenting with and implementing AI, adoption in many developing-country contexts remains relatively limited. In Africa, for example, AI integration in libraries is still at an early stage compared with more developed regions. A study involving 102 university libraries across English-speaking African countries found that only a small number had adopted technologies such as chatbots, ChatGPT, robotics, RFID and Grammarly (Abba, 2024). These AI technologies are used to support various library services. They can help answer directional and simple reference questions from users, provide information for cataloguing library materials, operate self-checkout services, promote library services, generate statistics and recommendations, and assist with the issuing and returning of library materials. Nevertheless, there are emerging examples of African academic libraries demonstrating what AI can contribute to service delivery. At the University of Lagos Main Library in Nigeria, for instance, an AI-powered humanoid robot known as “RoboScholar” has been used to support user assistance, face recognition, shelf management and surveillance. The university reported that the technology helped reduce the time and effort required to respond to simple reference questions (UNILAG LIBRARY, 2025). Similarly, in South Africa, some libraries have been reported to be using chatbots, RFID self-checkout systems, AI-supported tools and robotic assistants to support library services (Abba, 2024). This demonstrates that AI integration in African academic libraries is not limited to physical robots but also includes conversational AI and virtual reference services.

Kenyan libraries are also looking at the possibilities that AI brings. According to Jebet and Gichugu (2025) several libraries in Kenya are adopting AI tools which are being utilized, to varying levels, in information retrieval, user assistance, data analysis, and preservation. This shows that AI is already being adopted to support service delivery in some of the Kenyan university libraries. Similarly, Sang and Macharia (2025) found that library staff had basic understanding of AI and were familiar with applications such as chatbots and recommendation systems and were comfortable using AI-powered resources and recognized their potential to improve library services; however, they raised concern about effective integration due to several challenges in Kenyan universities. This implies that adoption and awareness of AI do not necessarily translate into extensive or effective integration because successful AI integration requires more than simply making AI tools available or staff being familiar. Libraries need to invest in the right infrastructure, provide necessary skills, have institutional support, adequate resources and come up with clear guidance on how AI should be integrated to enhance library services.

The situation therefore presents an important tension for academic libraries in Kenya. On the one hand, AI offers significant opportunities to improve the speed, efficiency, accessibility, responsiveness, and inclusivity of library services. On the other hand, the potential of AI may remain largely unrealized if its integration is not examined in relation to actual service delivery outcomes. Without empirical evidence on whether and how AI integration improves access for users with disabilities, supports remote access, addresses diverse language needs, enables personalised services, and provides timely virtual assistance, academic libraries may lack the evidence needed to guide effective and inclusive AI integration. It is against this background that the present study sought to examine the contribution of AI integration for inclusive service delivery, thereby providing evidence on whether the anticipated benefits of AI are being translated into meaningful and equitable library services in selected university libraries in Nairobi County, Kenya.



Materials and Methods

The study adopted a descriptive research design. The target population was 73 librarians; 62 librarians from Kenyatta University and 11 from Aga Khan University, Kenya. In this study, the researcher employed the census sampling technique to include all 73 librarians from the selected university libraries as participants because of the relatively small number. Additionally, 2 head systems librarians (one from each university) were purposively selected as key informants due to their specialized knowledge, deep understanding of technologies like AI tools as well as the practical experience in the implementation of such tools and managing of systems in their libraries. The sample size of 73 librarians is shown in Table 1.

Table 1. Sampling frame

University	Systems Librarians	Librarians	Total
Kenyatta University	1	61	62
Aga Khan University	1	10	11
Sample Size	2	71	73

This study used a structured questionnaire with open and close-ended questions to collect primary data from the librarians. Interview schedules were used to gather data from systems librarians/ digital media specialists from the selected universities. The quantitative data was organized, and analyzed with the help of the Statistical Package for Social Sciences (SPSS 27) software. The study used descriptive and inferential statistics. Qualitative data obtained from the semi-structured interviews were transcribed word for word and analyzed using thematic analysis. Correlation analysis between integration of artificial intelligence and service delivery in selected universities in Nairobi County was done using Pearson correlation.

Results and Discussion

The study sought to assess the contribution of artificial intelligence integration to inclusive service delivery in selected academic libraries in Nairobi County, Kenya. The target population comprised 73 respondents. The questionnaires were shared to 73 participants through Google Forms. 66 participants filled and submitted their responses, resulting in a response rate of 90.4%. First librarians were asked whether, in their opinion, AI had helped create a more inclusive library environment. The findings are presented in Table 2.

Table 2. Responses on whether AI helped create a more inclusive library environment

Responses	Frequency	Percentage
Yes, significantly	27	41.0
Yes, to some extent	22	33.3
Not sure	9	13.6
No noticeable impact	8	12.1
Total	66	100.0

The study findings indicate that 41% of the librarians in the selected university libraries perceived that AI had contributed significantly to creating a more inclusive library environment, while 33.3% indicated that it had contributed to some extent. Collectively, this means that 74.3% of the respondents perceived AI as having made positive contribution to inclusivity in library service delivery. This positive findings by the majority of librarians may be attributed to the ability of AI-enabled services to improve access to information, provide alternative ways of interacting with library resources, and support users with diverse information needs. On the contrary, 12.1% of the librarians from the two selected institutions reported no noticeable impact while 13.6% were not sure whether AI had contributed to creating a more inclusive library environment. These responses though minimal suggests that the contribution of AI to inclusive service delivery is still not perceived uniformly by all librarians.

The study also sought to establish some of the AI-enabled assistive technologies being used by librarians in the selected academic libraries to enable and support inclusive access to library services and resources. Librarians were asked to select



all technologies that were currently available or they were using in their libraries from the list of major AI-enabled assistive tools provided by the researcher. The results are summarized in Table 3 below.

Table 3. AI enabled assistive technologies used by librarians in the selected academic libraries

AI-Enabled Assistive Technologies	Frequency	Valid Percent
Chatbots with accessibility support	25	37.9
Speech-to-text tools	26	39.4
AI-powered screen readers	54	81.8
Text-to-speech tools	56	84.8
Real-time translation tools	25	37.9
Visual recognition tools	15	22.7

Table 3 shows opinion of respondents regarding the kinds of AI-based assistive technologies that are either embedded in library services or used to support inclusive access to library services and resources. Of the valid responses, text to speech tools were the most commonly utilized assistive technology tools among the selected libraries, mentioned by 56 respondents (valid percent of 84.6%). It was closely followed by AI-powered screen readers (like NVDA and JAWS), which was reported by 54 respondents (valid percent of 81.8%). The high levels of utilization of these two technologies suggest that AI is particularly being applied to support users who may experience difficulties accessing text-based digital information. Speech to text assistive technology (like Google Live Transcribe, Otter.ai), was reported by 26 respondents (valid percent of 39.4%), while chatbots with accessibility support and real-time translation tools were each reported by 25 respondents (valid percent of 37.9%). This indicates that these technologies were available or being used but to a lesser extent compared with text-to-speech tools and AI-powered screen readers. Visual recognition tools recorded the lowest level of reported use, with 15 respondents (valid percent of 22.7%) indicating their use, which suggests that the application of AI for recognising or describing visual content was less common in the selected academic libraries.

The 73 study participants were also asked to indicate their level of agreement with statements relating to how AI has influenced efficiency of library operations. 66 valid questionnaire responses were obtained and included in the quantitative analysis. The responses were measured using a five-point Likert scale. The findings are presented in Table 4 below.

Table 4. Contribution of AI integration for inclusive library service delivery

Statement	Valid (n)	Mean	Std. Deviation
AI has improved access to library services & resources for users with disabilities	66	4.0952	0.94552
AI enables remote users to access library services more effectively.	66	4.0317	0.98322
AI supports users with different language needs	66	4.0476	0.86934
AI provides personalized services that meet diverse user needs	66	3.9206	0.90343
AI-powered virtual assistance enables users to receive support anytime	66	4.0159	1.11431

Table 4 presents descriptive statistics for respondents' degree of agreement with the five statements on contribution of artificial intelligence-based assistive technology on accessibility and inclusivity of library service delivery on a 5-point scale. Mean scores for all the five items were greater than 3.9, implying that respondents agreed, and in some instances strongly agreed, that the use of artificial intelligence had contributed to accessibility and inclusivity in their libraries. The AI enhances library services and resources access for users with disabilities is a statement which was rated as the one receiving highest mean score ($M = 4.0952$, $SD = .94552$). The rating of this statement ranges between 2.00 to 5.00. This reflects the most favourable degree of agreement out of the five statements. The AI assists users with diverse language needs had the second highest mean score ($M = 4.0476$, $SD = .86934$). However, this statement stands out with the lowest standard deviation of all five statements, thus, reflecting the greatest degree of agreement by the respondents. This reflects a high degree of consensus that AI is assisting in overcoming language barriers among library users.



The ability for remote users to utilize library services through the use of AI was ranked third ($M = 4.0317$, $SD = .98322$), which shows high level of agreement that AI has made library services more accessible to remote users. This is crucial in terms of extending library services outside of the physical library space to distant learners and those not physically present in the library premises. Provision of virtual assistance at any time through AI scored highest standard deviation ($SD = 1.11431$) compared to all other five factors, and is the only factor with the lowest score of 1.00 compared to the minimum score of 2.00 for all other factors. Personalized services tailored to the unique needs of each user was noted to have achieved the lowest mean score of the five items ($M = 3.9206$, $SD = .90343$). This indicates that despite the agreement that AI offers personalized services, it may be considered less of an achieved advantage in comparison with the other benefits mentioned in the remaining four items. Two informants were interviewed in this research study. One informant was a Systems Librarian who worked in such a position for 10 years. The other informant was a Digital Media Specialist doubling up as a systems librarian for his university and had worked in such a position for 5 years. In terms of which library services had seen the most improvement in incorporating AI, the Systems Librarian cited academic research support, research training, and plagiarism checking. As for tangible improvements, the Systems Librarian mentioned that user satisfaction had improved after resolving queries, while the Digital Media Specialist indicated that AI-powered search and discovery features have made it easier for users to find relevant information quickly, contributing to higher usage of subscribed databases and improved engagement with library resource.

The study used Pearson Correlation in order to measure the strength and the relationship between AI integration on operational efficiency and service delivery in selected academic libraries in Nairobi County, Kenya. Correlation findings are presented in Table 5.

Table 5. Coefficient of correlation on AI integration and inclusive library service delivery

Variables		AI integration	Service delivery
AI integration	Pearson Correlation	1	.615**
	Sig. (2-tailed)		.000
	N	66	66
Service delivery	Pearson Correlation	.615**	1
	Sig. (2-tailed)	.000	
	N	66	66

** . Correlation is significant at the 0.05 level (2-tailed).

There was statistically significant positive correlation between the integration of artificial intelligence and service delivery ($r = .615$, $p < .001$, $N = 66$). The above-mentioned correlation coefficient implies a fairly strong positive correlation between AI integration and service delivery; therefore, higher levels of AI integration were associated with higher levels of service delivery among the selected academic libraries. As the p-value was less than the 0.05 significance level, the null hypothesis was rejected. The findings therefore imply significant relationship between AI integration and service delivery in selected university libraries.

Conclusions and Recommendations

The integration of artificial intelligence in enhancing service delivery in selected university libraries in Nairobi County is present and is growing; however, it is still at a moderate level of maturity where there is presence of integrated applications and not autonomous ones mainly in information discovery and academic integrity. In addition, integration of AI in library services has positively impacted service delivery, making services faster, accurate, and easily accessible to all kind of users.

The recommendations are; University library administration needs to adopt a systematic approach toward integrating AI into the library processes including information searching as well as in circulation services and library technical processes like cataloguing which are less integrated with AI. They must also expand the use of any proven AI-based solutions, for example AI-powered discovery tools and virtual reference services, in all subject and service areas, while simultaneously collecting data to prove the success of this process through performance improvements. In addition, academic libraries must increase



spending on less-used assistive technologies, in particular, real-time translation and visual recognition software, in addition to the already available solutions, such as text-to-speech and screen-readers.

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