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Role of AI Applications in Enhancing Information-Seeking Experience of Postgraduate Students at Public Universities in the Eastern Region of Kenya

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Abstract

Postgraduate students are increasingly using AI to support their learning activities, which involve extensive research that requires advanced information retrieval, synthesis, and analysis. However, the role of AI in enhancing information seeking of postgraduate students in public university libraries is not well understood, particularly in the Eastern region of Kenya. This study evaluated the role of AI applications in enhancing the information-seeking experience of postgraduate students at selected public universities in the Eastern region of Kenya. The study was grounded on the diffusion of innovation theory and socio-technical systems theory to explore the use of technology in higher learning settings. The descriptive survey research design was employed with a mixed-methods approach, allowing the collection and analysis of qualitative and quantitative data from postgraduate students and library section heads at Chuka, Tharaka, and Embu universities. Questionnaires were administered to 325 randomly sampled postgraduate students, while 6 purposively sampled library heads were interviewed. Data analysis entailed descriptive statistical analyses in which frequencies and percentages of responses were summarized and presented with tables and graphs. Thematic analysis was employed to analyze qualitative data collected through interviews. The study findings showed that the role of AI was to profile and predict students' information-seeking behaviours to support personalised learning, which enhanced the information-seeking experience of postgraduate students at public universities in the Eastern region of Kenya. The study concludes that AI technologies offer various benefits that enhance information-seeking experience among postgraduate students in public universities in the Eastern region of Kenya. Although challenges such as limited integration of AI in university libraries impacted the potential benefits of AI on the information-seeking experience in university libraries. The study recommends that librarians and students advocate for the integration of AI technologies in academic libraries to enhance the information-seeking experience of postgraduate students at public universities in the Eastern region of Kenya.

Keywords: *AI application, information-seeking experience, postgraduate students, public universities*

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1. Introduction

Recent technological advancements have led to the wide adoption of Artificial Intelligence (AI) technologies in various sectors to support innovative practices that improve the efficiency of conventional systems. In the education sector, the integration of AI technologies is intended to enhance the teaching process and improve learning experiences by refining pedagogical activities, accessing quality informational materials, and increasing student engagement and learning outcomes (Chege & Kihara, 2025). Research and academic writing are key aspects of higher education, whereby postgraduate students are required to effectively use various information management systems, such as libraries, to access and utilize relevant information to perform their academic tasks. AI technologies are shown to significantly impact information seeking for academic purposes by transforming how postgraduate students seek, access, and retrieve information in research. Ismaila (2019) highlights that information seeking in educational settings was facilitated through various strategies, which include the use of computer systems connected to the internet for online searches or physical copies of books and journals at a library. Information-seeking experience encompasses both active and passive methods, including planning, strategizing, motivation, awareness, understanding, and evaluation of available sources and channels. The high expectations on librarians to meet the set operating standards and deliver quality knowledge management services underscore the necessity of integrating advanced technologies to improve information seeking, retrieval, and overall user experiences in academic libraries.

Postgraduate student use both digital and print formats when seeking information to fulfil their information needs. In this context, academic libraries play a central role in enabling all library users to access, retrieve, and use informational resources effectively and efficiently in educational settings. This is achieved through the provision of information services and resources that aim to empower users to meet their information needs. Essentially, libraries are guided by a set of standards and guidelines that ensure acquisition, utilization, sharing, and preservation of informational sources for teaching, learning, and research purposes. Traditional libraries mainly offer informational resources through their physical sites, which were primarily available in print, including textbooks, journals, indexes, and magazines. The need to enhance the information-seeking experience of users has led libraries to adopt innovative information services through computerization and integration of digital information materials and collections such as e-journals, e-books, and online databases (Masinde et al., 2024).

Aldoseri et al. (2024) explain that modern technologies, including AI-powered tools, facilitate faster access to information globally, a shift increasingly adopted by libraries. Chander et al. (2022) suggest that recent technological advancements have led to the development and integration of informational management systems, such as AI, which are reshaping library operations, enhancing user experiences with postgraduate students among the main beneficiaries. AI technologies can be used to enhance the information-seeking experience by making it more efficient, personalized, and adaptive to user needs, thereby transforming how individuals access and interact with information in various fields. According to Nwakunor (2021), AI enables computers and software to function intelligently, much like the human

mind, involving systems capable of learning, reasoning, understanding language, and performing other types of accomplishments that require human intelligence. AI's adaptability has led to its widespread application for human progress and convenience. This study attempts to establish how academic libraries have integrated AI technologies to enhance postgraduate students' information-seeking experience in public universities in the Eastern region of Kenya. At the core of this was to incorporate both qualitative and quantitative approaches to comprehensively explore the role of AI technologies in select academic libraries in Kenya from a cross-sectional perspective.

1.1 Problem Statement

Postgraduate students have more complex information needs, which demand adequate resources and advanced tools to retrieve, synthesize, and analyze information effectively. Unlike undergraduates, they require access to specialized academic literature, databases, and research tools tailored to their specific fields of study. Despite the availability of information resources, many postgraduate students encountered difficulties in locating and critically evaluating relevant materials. Traditional systems often lacked personalization, which prompted the need for intelligent tools that support efficient and targeted information retrieval. Contextually, artificial intelligence (AI) emerged as a key enabler in enhancing efficient information retrieval by accelerating access to relevant data and transforming how information is filtered, accessed, and applied in scholarly work. Nevertheless, many students continued to face challenges due to limited skills, inadequate tools, or insufficient support. Moreover, there is still limited documentation on the types of challenges faced, the effectiveness of AI tools in academic contexts, and how these technologies are currently being utilized. This study addressed this knowledge gap by evaluating AI's potential to transform the postgraduate information-seeking experience. The failure to integrate artificial intelligence systems in university libraries would deny the wide opportunities presented by AI in the information-seeking and retrieval process.

1.2 Objective of the Study

To evaluate the role of AI applications in enhancing the information-seeking experience of postgraduate students at selected public universities in the Eastern region of Kenya.

2. Literature Review

2.1 Empirical Review

Globally, university libraries are focusing on improving content access by integrating AI systems such as chatbots, semantic search engines, and recommendation systems. In the USA, libraries have embraced the emergence of artificial intelligence and the potential benefits it provides in improving the information-seeking process in terms of accuracy, reliability, and ease of access (Pence, 2022). Blatch-Jones et al. (2024) argued that AI tools improved data processing, strategic decision-making, and research insights in knowledge management organizations in the United Kingdom. Even though most academic libraries in Italy, Mexico, Bulgaria, and Bangladesh had integrated AI technologies to enhance information seeking, Lau et al. (2025) recommended institutional standards as well as policy frameworks that guided the ethical use and accountability in the use of AI tools in teaching and learning. Winkler and Kiszl (2022) also revealed that approximately 25% of the surveyed libraries in Hungary had implemented AI-supported solutions, predominantly in information retrieval and data

processing. Moreover, Hasan et al. (2024) found that integration of AI chatbots in higher learning institutions in India featured conversational interfaces that supported information searching, easy access to informational sources, and improved students' analytical and research skills.

In Africa, libraries are increasingly embracing the application and use of new technologies in research activities, which increases accessibility to information resources. Buitrago-Ciro et al. (2025) found that most university libraries in the sub-Saharan region of Africa had adopted AI technologies, although they lacked effective policies and standards that guided ethical use of AI technologies for teaching and learning. Adeyeye and Oladokun (2023) explored the application of emerging technologies for research support in Nigerian academic libraries. The study found that AI integration enhanced the efficiency of managing vast informational resources within academic libraries; however, effective integration was limited by factors such as inadequate infrastructure, lack of skilled personnel, and resistance to change. Ogwo et al. (2023) also found that AI technologies such as natural language processing, robotics, big data analytics, chatbots, machine learning, and expert systems have the potential to enhance productivity, personalize user services, improve information accessibility, and streamline operations in academic libraries.

The local geographical context shows that AI tools have the potential to enable academic libraries to support innovative teaching and learning processes in educational settings. According to Ndungi and Siregar (2023), AI has the power to transform various industries, including the information sector. AI's ability to imitate humans' brainpower will affect the habits of every user, thus enhancing new experiences. Masinde et al. (2024) found the role of AI tools in Kenyan academic libraries involved information retrieval, data management, user services, and decision support systems. Razafiarivony and Nyaboke (2025) argued that the perceived usefulness of AI tools positively influenced the adoption of these tools to support academic information seeking and learning. However, challenges including inadequate infrastructure, staff capacity, and lack of legislative support frameworks hindered effective adoption and application of AI tools to enhance positive outcomes in academic libraries in Kenya (Obura & Emoit, 2025). The review of existing studies highlights that developing countries face various challenges that limit the adoption of emergent technologies to support academic processes, which include inadequate resources and limited administrative support. This normally leads to the reliance on traditional systems that are often misaligned with contemporary preferences and user needs. Thus, there is a need for integration of informational resources that enhance information seeking and retrieval for academic purposes, particularly among postgraduate students.

2.2 Theoretical Review

This study is anchored on the Diffusion of Innovation (DOI) theory that helped in exploring user acceptance and application of technology in institutional settings. The theory offers a framework for examining the process through which individuals and organizations adopt new ideas and technologies. The theory posits that adoption rates depend on several key factors: perceived compatibility (how well an innovation aligns with existing systems and processes), relative advantage (the benefits over traditional methods, such as AI over manual methods), complexity (ease of understanding and use), trialability (opportunities for testing through pilots or demos), and observability (the visibility of results and benefits from early adopters). The

theory was considered ideal for this study since it explained which AI technologies were adopted in libraries and the reasons behind their integration, as well as the extent of their use. Adoption is more likely when users perceive AI as more beneficial than traditional methods, particularly if the tools are simple, user-friendly, and supported by adequate training from information professionals. Compatibility with existing systems and positive outcomes from early adopters also encourage wider acceptance. As a social theory, DOI underscores the role of perceived compatibility, which suggests that societies may adopt new technologies even when they are not fully aligned with prior experiences or values. However, the theory has been criticized for overlooking organizational and environmental factors, focusing mainly on individuals rather than the collective or institutional context. In universities, for instance, AI adoption is shaped by institutional policies, available resources, and group decision-making processes, elements that DOI may fail to fully account for in this study.

3. Methodology

This study was conducted at selected public universities located in the Eastern region of Kenya, specifically Chuka University, Tharaka University, and the University of Embu. The cross-sectional descriptive survey research design with a mixed research methodology was adopted to evaluate the role of AI tools in enhancing information seeking among postgraduate students in selected public universities in the Eastern Region of Kenya. The target population comprised 1700 postgraduate students and 15 heads of library sections across the 3 selected public universities in the Eastern region of Kenya. A sample size of 331 study participants was obtained, in which 325 postgraduate students were selected using the stratified random sampling technique, while 6 heads of library sections were purposively sampled to take part in the study.

Data collection involved structured questionnaires that were used to collect quantitative data from the sample of postgraduate students, while the heads of library sections were interviewed to obtain qualitative data. The validity and reliability of research instruments were tested through a pilot study that was conducted at Meru University of Science and Technology. Face validity and content validity were verified through expert review, and the reliability was tested using Cronbach's Alpha, in which the coefficient was above 0.7 and thus considered acceptable for this study.

The quantitative data collected were analyzed using the IBM Statistical Package for Social Sciences (SPSS) version 26, whereby descriptive statistical results consisting of frequency distribution and percentages were generated and presented using tables and graphs. Additionally, thematic content analysis was employed for the analysis of the qualitative data collected by interviewing library section heads. The findings were reported using concise descriptive narrations that presented the identified themes on the role of AI tools to enhance information seeking among postgraduate students in the selected public universities in the Eastern region of Kenya.

4. Results and Discussion

This section presents the study results and discusses the findings on the role of AI applications in enhancing information-seeking experience among postgraduate students in Public Universities in the Eastern region of Kenya.

4.1 Response Rate

The response rate of the study was 83.4% in which out of 325 administered questionnaires, 271 questionnaires were completed and returned for further analysis. Moreover, 5 university library section heads, out of 6, participated in the study, leading to a response rate of 83.3% for the interviews. This indicated a satisfactorily high response rate among the postgraduate students, which showcased that the data collected was representative of the target population of the study.

4.2 The role of AI applications in enhancing the information-seeking experience of postgraduate students

4.2.1 Results from postgraduate students

The postgraduate students participating in the study were required to respond to seven questionnaire items that underpinned how existing AI tools improved the information-seeking experience. The data collected was summarized and presented in Table 4.3, which shows the frequency distribution of the responses.

Table 1: How artificial intelligence applications improved information-seeking experience among postgraduate students

Statements	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
AI-powered tools make the information-seeking process faster.	3	58	69	100	41
	1.1%	21.4%	25.5%	36.9%	15.1%
AI applications improve the accuracy of search results for academic work.	7	57	102	71	34
	2.6%	21.0%	37.6%	26.2%	12.5%
AI tools enhance my ability to discover resources that I might have missed otherwise.	5	65	109	63	29
	1.8%	24.0%	40.2%	23.2%	10.7%
AI tools simplify complex tasks, such as summarizing academic papers or synthesizing information.	13	70	78	85	25
	4.8%	25.8%	28.8%	31.4%	9.2%
AI tools enhance my ability to brainstorm and refine research topics	18	67	100	71	15
	6.6%	24.7%	36.9%	26.2%	5.5%
AI-integrated library systems improve my access to academic resources	16	73	91	64	27
	5.9%	26.9%	33.6%	23.6%	10.0%
AI reference management tools assist me in organizing and citing my sources effectively.	25	70	82	67	27
	9.2%	25.8%	30.3%	24.7%	10.0%

The study found that the majority of postgraduate students agreed that AI-powered tools make information-seeking processes faster (n=100, 36.9%) and helped in simplifying complex tasks such as summarizing a research paper (n=85, 31.4%). The study also established that most of the students were not sure on the use of AI technologies to improve the accuracy of search results (n=102, 37.6%), discovery of information sources (n=109, 40.2%), brainstorming and refining research topics (n=100, 36.9%), access to academic sources in libraries (n=91, 33.6%), and reference management (n=82, 30.3%). This implied that postgraduate students were not familiar with the application of AI systems in performing most information-seeking processes, such as organization, refining, and processing information sources used in academic tasks. The findings corroborated Adeyeye and Oladokun (2023) that the effective application of AI systems to enhance information seeking was influenced by factors like support services, adequate infrastructure, and strategic planning. However, the findings contrast with those of Jebet (2025), who asserted that AI technologies were integrated in most universities to facilitate information retrieval and knowledge management.

4.2.2 Qualitative findings from heads of library sections

The heads of library sections pointed out that AI tools increased the efficiency and effectiveness of seeking information for academic purposes among postgraduate students. This involved reducing the time taken to retrieve relevant literature sources in various literature databases, including digital libraries, institutional repositories, and the internet. As one of the librarians stated, "*The use of AI tools has the potential to reduce the time spent by postgraduate students to locate, summarise and reference relevant literature for academic purposes*." The study findings supported Hasan et al. (2024), who showed that AI tools, including AI chatbots, had the potential to improve information seeking by facilitating easy access to relevant literature. Moreover, Adeyeye and Oladokun (2023) asserted that AI tools helped increase students' productivity in seeking information sources in academic settings. Thus, this study determined that one of the roles of AI tools in information seeking involved reducing the time taken for seeking and finding information for academic use.

AI technologies were also identified to improve information retrieval by providing search results based on personalized recommendations. The library heads reported that AI tools offered various functionalities that improved the ease with which postgraduate students searched and retrieved relevant literature for their academic research activities. The study findings were supported by Winkler and Kiszl's (2022) findings that integration of AI systems in libraries improved information seeking, especially in information retrieval and data processing. Thus, the study established that improved discoverability and personalized literature recommendations were an impact of AI tools, which facilitated an improved information-seeking experience of postgraduate students in the selected public universities.

The library heads also highlighted that AI tools improved the effectiveness of information literacy programs and support provided to postgraduate students during information seeking. This involved the use of generative pre-trained models (GPT) chatbots, which allowed postgraduate students to query and get support on using library tools anytime, even after the actual information literacy training sessions. The study findings were also highlighted by Micheni et al. (2024), who identified that AI tools had the capacity to improve service delivery in university libraries by providing personalized support for users to learn how to use library resources.

The study also sought to determine the specific AI application and functionalities that improved postgraduate students' information-seeking experience. The library heads believed that integration of existing AI platforms, such as ChatGPT, enabled university libraries to increase their library collection of resources that may be used by postgraduate students to find relevant information. AI chatbots featured natural language processing functionalities that allowed students to process and use unstructured data to find information for research purposes. The findings supported Nyamwange (2025), who argued that AI-based virtual assistants featured conversational and generative interfaces in which users input prompts and received responses in a conversational style, which improved user engagement on a certain topic. The findings suggested that AI tools featured functionalities that allowed their use as a virtual assistant to users on various academic and research-based queries that supported information seeking and improved user experience.

5. Conclusion

The study concluded that the role of AI tools in enhancing information seeking for postgraduate students involved efficient information retrieval and processing, improved discoverability of relevant literature, personalized information recommendations, and AI-based virtual assistance and support. Furthermore, postgraduate students were not sure about the role of AI tools for semantic search, accessing published literature in their university library, and AI reference management, which indicated low familiarity with integrated AI tools for information seeking in the university libraries. On that note, the study concluded that the inadequate integration of AI systems to enhance information-seeking experience among postgraduate students in Chuka University, Tharaka University, and the University of Embu.

6. Recommendations

Based on the conclusions, the study recommends that librarians, university administrators, and students collaborate in identifying and integrating AI technologies in various educational areas within universities, including libraries. This will facilitate the provision of innovative teaching and learning processes in universities by leveraging the benefits of AI technologies in enhancing information seeking, research, and knowledge management in higher learning educational settings. The study also recommends that policymakers to make policies that mandate institutional standards and guidelines that advocate for the ethical use of AI technologies in educational settings. In addition, the study recommends that further studies be conducted to establish both negative and positive effects of integrating AI technologies in academic settings, which is crucial for empirically informing whether the benefits of AI outweigh its costs in enhancing teaching and learning in educational settings.

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