CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Information sharing is the exchange of information among persons who have common interest. It involves passing information from a source where it originates or where it is stored to a recipient where it is needed. Information sharing has two key components: transfer and exchange (Bouthillier, 2024). Information transfer is a voluntary act of making information available to others, that is; the sharer could pass information to another, perceived to be in need of the information (Akbulut, 2024). In this case, the sharer is under no obligation to share but is willing to give information to the other. In information exchange, information is shared based on self-interest and reciprocity (Krishna, 2024). In this case, a sender only performs the action when the receiver is willing to reciprocate, that is, not only being willing to receive, but also interested in satisfying the need of the sender by passing on the information in his possession. Hence, information is shared when the activity is perceived to satisfy individual or common interests of the participants (Bouthillier, 2024).

Sanger (2021) defines information sharing as “an umbrella concept that covers a wide range of collaborative behaviors from sharing accidentally encountered information to collaborative query formulation and retrieval”. Hence, information sharing cannot occur with an individual only, without involving another entity playing the receiving or exchange function. Information Sharing is a crucial aspect of any academic or professional community, facilitating knowledge dissemination, collaboration, and innovation. Artificial intelligence has been dubbed the fourth industrial revolution (Park, 2019). Artificial intelligence (AI) refers to machines that mimic human reasoning, decision-making, learning, and social skills (CILIP, 2021). Holmes et al.

(2019) assert that AI can be conceptualized as computer programs that carry out tasks that ordinarily require human intelligence. Examples of these technologies include computers, scanning and printing devices, electronic resources, CCTV cameras, social media, and most recently, RFID technology.

Artificial intelligence applications are now visibly present in almost every aspect of human civilisation. It has brought about changes and new competitive advantages in numerous institutions and service organisations. As a result, AI has shown to be extremely useful and advantageous in a variety of industries, including banking and finance, marketing, running healthcare systems, and smart applications (such as facial recognition, voice recognition, location assistant, etcetera). Like in many other fields as mentioned above, artificial intelligence (AI) may assist librarians in updating and expanding their services and in promoting their relevance in the contemporary digital environment. Artificial intelligence (AI) is the impersonation of human knowledge procedures, for example, discourse and visual acknowledgment, interpretation of the dialects and virtual decision making by machines and robots (Beerends, 2024). The capacity of machine to think and act like people, has given AI an extraordinary place in all fields.

Artificial intelligence is available in different parts of our lives beginning from smart sensors to individual associates. Recent developments in AI have gotten numerous enormous changes in the higher education field (Ahmed, 2024). “Artificial intelligence helps students and teachers to make their educational experience wonderful” (Netragaonkar, 2024). Artificial intelligence (AI) is characterized as the capacity and improvement of a data innovation-based PC frameworks or different machines to finish the jobs that typically require human knowledge and rational thinking. Despite the fact that AI can make the world a superior spot, AI accompanies its very own issues (Siau, 2018).

Artificial Intelligence (AI) is another innovation that intelligently uses machines to do what humans can do and perform more faster than humans at processing vast volumes of data and making predictions (Wheatley and Hervieux, 2019). While the enormous amount of data generated every day would require a long time to be processed, AI technologies that use machine learning can swiftly transform that data into useful knowledge (Ajani et al., 2022). The cost of processing the enormous amounts of data that AI programming demands is now the main drawback of employing AI. Nevertheless, researchers testified that the benefits of AI to its users significantly outweigh its cost (Ali et al., 2020). For instance, Hayani et al. (2021) acknowledged that when properly utilized, AI can enhance its users' productivity, economy, and decision-making process, as well as solving complex problems and manage repetitive task accurately than ever before.

Artificial intelligence is presently advancing at a quickened pace, and this as an impact on the significant idea of administrations of advanced education. For example, Platform Capital's funding in June 2020 allowed the University of Lagos to become the first organisation in Nigeria to employ artificial intelligence. The robots, which are "cloud-based intelligent humanoid robots," have the following features, according to the information provided by Roboscholar: face recognition, surveillance technology, Open API, data management, advert and promotion, book shelf management, research, customizable, and entry validation (University of Lagos, 2020). This is changing the structure for the nature of administrations, the dynamic of time inside the college, and the structure of its workforce. A super-PC ready to give bespoke input at any hour is lessening the need to utilize a similar number of managerial staff already serving this capacity.

However, the current advancements in deep learning and machine learning have led to a paradigm shift in a lot of sectors within the technology industry. It is noteworthy that, as technology advances, previous benchmarks that defined AI are becoming increasingly outdated and ineffective. For instance, machines that recognize texts through optimal characters or calculate basic functions are gradually becoming redundant (Cioff et al., 2020). Most businesses do not believe that they have AI-based systems, because their processes have been replaced by advanced technologies. Nonetheless, AI is constantly developing to meet the needs of different industries. This is the reason why innovators rely on cross-disciplinary approaches during the development stage, whereby they integrate mathematics, psychology, computer science, and linguistics, and other features. The technology has been widely adopted in healthcare, automotive, and financial industries (Haenlein and Kaplan, 2019).

Machine learning is one of the leading approaches to AI, which uses numerical optimization or statistical methods to derive models from available information. The derivation process does not program all computing steps or model parameters. Rather, a principal feature of this technique is the use of probabilities to depict uncertainties existing in real-world problems. There are three major classifications of machine learning, namely supervised, unsupervised, and reinforcement learning (Shabbir and Anwer, 2018). Supervised learning requires labeled data in computational models. On the other hand, unsupervised learning requires unlabeled data to determine patterns in models, while reinforcement learning does not require labeled data. Instead, reinforcement learning requires action-based information, such as punishment or rewards, in training computational models. Also, the tasks implemented in machine learning systems have different categories. The first category stems from goals, which identify various tasks, including classification, prediction, and clustering (Woschank et al., 2020).

In line with the classification, its objective is to categories and defines a target. For example, a land parcel can be classified as agricultural or commercial. Based on clustering, the intent is to determine the propensity for clusters; for instance, the number of vehicles in a location to detect traffic jams. The last task prediction forecasts unknown values, such as the expected temperatures in a geographical location, based on previous information and using regression models. Other tasks conducted by machine learning systems include novelty detection, visualization, and data generation. There are various machine learning models available to researchers and corporations, including regression, random forest, decision tree, and artificial neural network (Woschank et al., 2020). Though these models apply to geographical data, they do not address the uniqueness of the phenomena. Particularly, they fail to consider different factors, such as spatial autocorrelation and non-stationarity.

Deep learning refers to a subset of machine learning that uses deep neural networks (i.e., DNNs) for predictive analysis. DNN is considered a type of artificial neural network (i.e., ANN), which has numerous layers between its input and the output. Each layer has connecting units, referred to as neurons, which transport the input through multiple layers and produce a non-linear output (Singh, 2019). In recent years, a lot of interest has been generated in deep learning because of its excellent performance. Its performance is based on a large variety of labeled datasets, including high performance computing, HPC, and ImageNet (Shabbir and Anwer, 2018). It is a subset of machine learning, which makes it possible to complete tasks like clustering, classification, and prediction. Deep learning systems also operate using different neural networks, including recurrent and convolutional neural networks (RNN and CNN, respectively) and long short-term memory (LSTM). Overall, the combination of neural networks and machine learning enhances the understanding of artificial intelligence.

Furthermore, it is a major development in contemporary intelligence systems. Convolutional Neural Networks (CNNs) Generally, CNN replicates the features of visual cortex and is often applied to advanced elements of computer vision. In symbolic systems, computer vision is based on images that adhere to the pre-set criteria for specific object designations; for instance, shapes, width, and height relationships (Woschank et al., 2020). A broader set of parameters can be accessed in CNN-based computer vision. Also, their relative weight can be adjusted, based on any specific circumstances. Thus, image classification can be adjusted according to the angle and the relative distance from a point (Rauch, 2020). For instance, the human head appears different from different angles; however, it remains the same. Similarly, fingers and toes constitute a person. Nonetheless, an individual must recognize each part and compare them with different sections to classify it as human. This comparative approach, rooted in a multiplicity of factors, denotes the nature of CNN. This approach is applicable for various processes, including drug discovery, natural language processing, and games.

5G is the fifth generation of wireless communications technologies supporting cellular data networks (Odida, 2024). Large-scale adoption began in 2019 and today virtually every telecommunication service provider in the developed world is upgrading its infrastructure to offer 5G functionality (Pirbhulal, 2024). 5G communication requires the use of communications devices (mostly mobile phones) designed to support the technology (Cheng, 2024). It is a very agile technology. 5G wireless technology is meant to deliver higher multi-Gbps peak data speeds, ultra-low latency, more reliability, massive network capacity, increased availability, and a more uniform user experience to more users (Rowshan, 2024). Higher performance and improved efficiency empower new user experiences and connects new industries. 5G provides a high plethora of Spectrum Bands; these are known as the Pioneering Bands (Devrari, 2024). There has

been a lot of talk about the frequency spectrum that 5G technology will use. With the first 5G-NR standard officially announced, network operators all over the world are conducting trials with the objective to deploy the technology commercially sometime in the next 2-3 years.

Different countries have proposed and are working on different frequency bands that range all the way from 600 MHz to 71 GHz (Wang, 2024). 5G is not a single homogeneous technology, so softwarization is important. The 5G networks are promising to meet the demands of various individual applications with a significant increase in size, content, and rate. It is also a platform for innovation to deal with millions of applications. The 5G networks however raise a number of issues that need to be tackled (Dwivedi, 2024). For instance, how to guarantee that the devices are interacting with each other with a latency of less than one millisecond? Although such concern is not a critical requirement in general telecommunication systems with only voice or data services, it is vital in some specific areas with particular services, such as healthcare, military, and disaster communications systems. 5G is an E2E ecosystem to enable a fully mobile and connected society. It empowers value creation towards customers and partners, through existing and emerging use cases, delivered with consistent experience, and enable by sustainable business models (Makinen, 2024).

5G provides a high data rate, improved quality of service (QoS), low-latency, high coverage, high reliability, and economically affordable services. 5G delivers services categorized into three categories: (1) Extreme mobile broadband (eMBB). It is a no standalone architecture that offers high-speed internet connectivity, greater bandwidth, moderate latency, UltraHD streaming videos, virtual reality and augmented reality (AR/VR) media, and many more. (2) Massive machine type communication (eMTC), 3GPP releases it in its 13th specification. It provides long-range and broadband machine-type communication at a very cost-effective price with less

power consumption. eMTC brings a high data rate service, low power, extended coverage via less device complexity through mobile carriers for IoT applications. (3) Ultra-reliable low latency communication (URLLC) offers low-latency and ultra-high reliability, rich quality of service (QoS), which is not possible with traditional mobile network architecture. URLLC is designed for on-demand real-time interaction such as remote surgery, vehicle to vehicle (V2V) communication, industry 4.0, smart grids, intelligent transport system, etc (Sharma, 2018).

To leverage the potentials of AI and 5G technologies for effective information sharing, universities and stakeholders can implement various strategies. These include investing in infrastructure development to improve internet connectivity, integrating AI-driven tools into LIS curriculum, providing training and capacity building programs on digital literacy and information management technologies, and fostering collaborations with industry partners to facilitate technology adoption (Senthilkumar, 2024). The rapid evolution of technology has transformed the landscape of information sharing and dissemination. In recent years, Artificial Intelligence (AI) and 5G technologies have emerged as powerful tools with the potential to revolutionize various aspects of education, including information exchange among students and academics (Shabbir and Anwer, 2018).

In the last two decades, the convergence of Artificial Intelligence (AI) and 5G technologies has revolutionized information sharing, particularly in the field of Library and Information Science (LIS). It is unarguable that technological and other societal changes have substantially impacted Library and Information Science (LIS) education worldwide. Literature has revealed that the most evident and measurable changes in LIS education are traceable to curricula and academic library services (Rosa, 2024). Although several studies have examined the impact of AI on library services, there has been limited research on leveraging AI tools and 5G technologies to

enhance effective information sharing among LIS postgraduate's students. Therefore, this study is aimed at leveraging AI tools and 5G technologies to enhance effective information sharing among LIS postgraduate's students in universities in South-west, Nigeria by exploring the level of awareness, identify the commonly use AI tools and 5G technologies, the frequency of usage, the benefits of utilization, the challenges associated and as well as the relationship between AI tools, 5G technologies and effective information sharing.

1.2 Statement of the Problem

While advancements in AI tools and 5G technologies promise enhanced information accessibility and collaboration, there is a paucity of research exploring their specific influence on information sharing among LIS postgraduate students. Recognizing this gap is essential to address the evolving needs of students in an era defined by rapid technological progress. In the present information age, the issue of student's use of AI and 5G technologies is of vital importance because the use of AI and 5G technologies by students would enhance competence and confidence in them. AI and 5G technologies in education has been connected to higher effectiveness, higher efficiency, and higher performance, including quality of cognitive, creative and advanced thinking (Adeosun, 2010). While there is extensive research on the benefits of AI tools and 5G technologies in various sectors, there is a notable gap in the literature specifically addressing their combined impact on enhancing information sharing among Library and Information Science (LIS) postgraduate students in Kwara State.

Most existing studies focus on AI and 5G technologies in developed countries, with limited research on their application in the African context, particularly in South-west Nigeria. There is a lack of research examining the specific needs and challenges faced by LIS postgraduate students, who have unique information-sharing requirements compared to other disciplines. Few studies explore the synergistic effects of combining AI tools and 5G technologies to enhance information sharing. Research often treats these technologies in isolation, missing the potential benefits of their integration. There is limited research that comprehensively analyzes how the integration of AI and 5G can improve the efficiency, relevance, and quality of academic resources and collaborations among postgraduate students. There is a gap in practical guidelines and strategies for implementing AI and 5G technologies in educational institutions in South-west Nigeria. Existing research lacks actionable insights on how to overcome local infrastructure and connectivity challenges. Only few studies address the specific training needs of students and faculty to effectively use AI and 5G technologies for academic purposes. Research often overlooks the importance of digital literacy and skill development in this context.

There is a need for empirical studies that provide quantitative and qualitative evidence on the impact of AI and 5G technologies on students' academic performance, research output, and overall learning experience. Long-term studies that track the sustained impact of these technologies over time are scarce. Most research provides short-term evaluations, which do not capture the evolving benefits and challenges. Research is needed to explore the policy and regulatory frameworks necessary to support the adoption of AI and 5G technologies in educational settings. This includes addressing data privacy, security, and ethical considerations specific to the Nigerian context. There is a lack of focus on ensuring that AI and 5G technologies are inclusive and accessible to all students, including those from disadvantaged backgrounds or

with disabilities. As a result of these lapses, it is crucial to develop effective strategies to leverage AI tools and 5G technologies, thereby enhancing information sharing among LIS postgraduate students in South-west Nigeria. Therefore, this research was conducted to contribute to the existing knowledge, to examine the salient areas that were not covered from previous publication. Review the literature of past research on how to leverage AI tools and 5G technologies to enhance effective information sharing among LIS postgraduate students in Kwara Nigeria.

1.3 Research Objectives

The main objective of the study is to determine how Artificial Intelligence tools and 5G technologies can be leverage to enhance effective information sharing among LIS postgraduate students in Kwara State, Nigeria. However, the specific objectives are to:

i. Determine the level of awareness of AI tools and 5G technologies among LIS postgraduate students in Kwara State;
ii. Identify the AI tools commonly used for information sharing by LIS postgraduate students in Kwara State; and
iii. Examine the frequency of use of AI tools and 5G technologies for effective information sharing among LIS postgraduate students in Kwara State.

1. 4 Research Questions

The following research questions were raised in line with the objectives of the study and are as follows:

i. What is the level of awareness of AI tools and 5G technologies among LIS postgraduate students in Kwara State?

ii. What are the AI tools commonly used for information sharing by LIS postgraduate students in Kwara State? and

iii. What is the frequency of use of AI tools and 5G technologies for effective information sharing among LIS postgraduate students in Kwara State?

1. 5 Scope of the Study

This research study concentrates on how postgraduate students in Library and Information Science programs within universities in Kwara State can leverage AI tools and 5G technologies to enhance effective information sharing. The concept of AI tools, 5G technologies, effective information sharing among LIS postgraduate students are the focus of this study. Furthermore, the terms used in the work are as appropriate for the purpose of this study. These terms will be explained in relations to finding out on the level of awareness of Library and Information Science postgraduate's students to AI tools and 5G technologies facilities in universities in South-West, Nigeria as a place of study; the commonly use AI tools and 5G technologies by these students and their perceptions on the benefits and challenges associated with the use of AI tools and 5G technologies. The study only covers all the postgraduate's schools of Library and Information Science in the three (3) categories of universities selected within South-West, Nigeria that offer a Master's degree in Library and Information Science. Thus, the study focused

on regular postgraduates only since including other categories of students might alter the findings.

1.6 Significance of the Study

This research holds significance in bridging the existing knowledge gap regarding the dynamic interplay between AI tools, 5G technologies, and effective information sharing within the LIS academic community. The findings will inform educators, policymakers, and technology developers, and contributing to the enhancement of educational practices and infrastructure. Firstly, the study will be beneficial to educators inform of capacity building and skill development. The integration of AI tools and 5G technologies in education can equip members with digital skills that are highly valued in the modern workforce.

Secondly, the study will be of great benefit to policymakers by providing valuable insights into the policy and regulatory considerations necessary for the successful implementation of AI and 5G technologies in education. Thirdly, the technology developers will also benefit from this study as a result of providing future direction in research and innovation in the field of educational technology. Similarly, the outcome of this study will be beneficial to library schools, students, academics, researchers and the management of higher institutions; By identifying the level of awareness and how they influence the students' decisions to use AI tools and 5G technologies, the study will help illuminate issues that encourage or discourage its use or improve their perceptions of using AI tools and 5G technologies.

Additionally, this study will also be beneficial to students and researchers who are interested in AI tools and 5G technologies usage as it will serve as a reference point for the current situation on issues relating to the use of AI tools and 5G technologies in academic institutions.

Lastly, the study will contribute to the existing body of knowledge and literatures in the use of AI tools and 5G technologies in tertiary institutions, thus leading to the implementation of policies towards ethical use of AI and 5G technologies and also serve as future reference for the other researchers.

1.7 Operational Definition of Terms

AI Tools: Artificial Intelligence (AI) is another innovation that intelligently uses machines to do what humans can do and perform faster than humans at processing vast volumes of data and making predictions.

Deep Learning: is the subset of machine learning methods based on neurals networks with representation learning.

Library and Information Science Schools*:* This is an institution of higher learning specialized in the professional training of librarians and information professionals.

Machine Learning*:* Machine learning focuses on software algorithms that learn from experience and improve their decision-making or predictive performance.

Postgraduate: A student who continues studies after graduation. (A) Of or relating to beyond a bachelor's degree.

Student: A learner who is enrolled in an educational institution. A learned person (especially in the humanities); someone who by long study has gained mastery in one or more disciplines.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter focused on extensive review of related and relevant literature on integration and use of cloud computing technology in university libraries. Review of related literature gives an evaluation of previous literature to the researcher's area of study. The review of this study is guided by the following research outlines/subheadings:

2.2 Information Sharing in LIS Education and Research;

2.3 AI in Information Science;

2.4 5G Technologies in LIS profession;

2.5 Challenges and Opportunities of AI and 5G Technologies; and

2.6 Appraisal of the Reviewed Literature.

2.2 Information Sharing in LIS Education and Research

Information Sharing is a crucial aspect of any academic or professional community, facilitating knowledge dissemination, collaboration, and innovation. In recent years, the convergence of Artificial Intelligence (AI) and 5G technologies has revolutionized information sharing, particularly in the field of Library and Information Science (LIS). This literature review aims to explore the role of AI and 5G technologies as determinants of effective information sharing among LIS postgraduates in universities in South-West Nigeria. It is unarguable that technological and other societal changes have substantially impacted Library and Information Science (LIS) education worldwide. Literature has revealed that the most evident and measurable changes in LIS education are traceable to curricula and academic library services (Rosa, 2024).

For instance, Ocholla and Ocholla's (2020) study of a content analysis of websites of 26 public universities' libraries in South Africa found out that some academic libraries are already responding to the 4th industrial revolution by providing services such as availability of Wi-Fi, 24/7 study areas, research commons, group study areas, maker spaces, borrowing ICTs (e.g. laptops), e-Resources (e.g. eBooks, databases, etc.), e-Catalogue, digital scholarship (including institutional repositories), research data services (e.g. RDS, RDM), open scholarship, information literacy, research information services, reference management tools (e.g., Endnote), libguides, tutorials (video) and Ask-a-librarian. Hence, the relevance and sustenance of library and information science education today will depend largely on the quality of faculty and students and their ability to use exponential technologies such as robotics, nanotechnology, artificial intelligence and quantum computers, all of which are products of the IoT that meet users' information needs.

The argument was corroborated in a study on curriculum development of LIS study program in the 4th industrial age; the findings revealed that students should have the knowledge creation, information literacy, information ethics, information business, visual information design, IT-Based Entrepreneurship, digitalization, Information Retrieval, web design, collection management, database management, library automation, graphic and electronic publishing management, knowledge management, Organizational Communication, Library Public Relations, Writing Scientific Papers, Multimedia Communication and Visual Information Design (Marlini, 2020). According to Chen (2024b), newer LIS schools appear to follow older schools' modified curricula. Examining these schools' curricula, some emphasize library science courses, while others struggle to balance library science and information communication technology. According to Greenshields (2024), library and information science (LIS) education can only be meaningfully considered in general education and its cultural milieu.

Ossai and Nwabuwe (2023) observed that Nigeria, like other countries, recognized education as the major instrument affecting national development. According to Adams (2024), the allure of modern communication technology has persuaded many librarian educators to focus on it and disregard elements of librarianship that do not fit within these technological constraints. The "lure on modern communication technologies" has performed a significant role in LIS education. According to Maimone (2024), the primary areas for librarians are knowledge organization and retrieval, promotion of culture and knowledge, knowledge of literature, library organization and management and information technology. Similarly, Khan (2024) undertook a comparative study of LIS graduate courses in the UK, the USA, India and Iran. They discovered that the efficiency of the courses offered is related to the state of the information sector in each country and that the gap between LIS education in industrialized and developing nations is expanding.

Many factors are at play in the LIS curriculum (Sivathanu and Pillai, 2018). While it is possible to anticipate that professional body accreditation will lead to some consistency in fundamental educational areas that match employers' requirements at an international level, this is not always the case. Information sharing forms the foundation of LIS education and research, enabling students and researchers to access, evaluate, and disseminate information effectively. In the context of Kwara State, Nigeria, where universities play a crucial role in shaping LIS professionals, understanding the dynamics of information sharing is essential. Understanding the social dynamics of information sharing lays the groundwork for evaluating the role of AI and 5G technologies in this context. Observation of current realities with regards to the need to communicate and meet frequently indicates that AI and 5G technologies and academic and research libraries have the potential to provide ways out of the challenges that hamper effective information sharing due to limited opportunity to communicate and meet in an atmosphere where discussion and learning can take place.

In the recent past, AI and 5G technologies have been identified as the major drivers of the information society, that is, a society where the creation of information and access to, and use of information strive. Like it is expected that AI and 5G technologies are able to sufficiently eradicate the challenges of communication that students that are involved in team-based learning face, stakeholders also feel that academic and research libraries in tertiary institutions should help to eradicate the problem of meeting venues that students involved in team-based learning normally encounter. There are various studies that have enumerated library and information services that academic and research libraries provide to students (Utulu and Ngwenyama, 2019). Kalogiannakis and Papadokis (2017) on the other hand, assessed the advantages learners derive from AI and 5G technologies because of AI and 5G technologies' ability to support learning and

access to information without temporal-special restrictions. In the library and information science field, there is a scarcity of studies done to assess how the proliferation of AI and 5G technologies has affected the education of library and information professionals.

Much of the studies done in the field of library and information science focus on how library and information professionals use AI and 5G technologies to achieve their professional and statutory goals. A good example is Bowler et al. (2018) study of the impact of AI and 5G technologies on information seeking behavior of youths. Bowler et al. (2018) was motivated by the possibility that AI and 5G technologies have the ability to change the ways youths seek information. Similar study was carried out by Chang and Zimmermaman (2019). Chang and Zimmermaman (2019) were interested in assessing the exact ways AI and 5G technologies are impacting and changing information behavior of information users. Shouhe and Jain (2017) did a study on how AI and 5G technologies impact information dissemination in the 21st Century. Typically, the major focus of library and information science scholars when it comes to studying AI and 5G technologies is to see how it impacts the ways libraries and information centers disseminate information in the 21st Century. Many authors in the library and information science field have looked into this subject from varying perspectives.

2.3 AI in Information Science

The integration of AI in information science has evolved, with studies emphasizing its potential to enhance information retrieval, classification, and analysis. Understanding how AI tools are perceived and utilized among postgraduate students is crucial in assessing their impact on information sharing practices. AI technologies, including machine learning, natural language processing, and knowledge representation, have transformed various aspects of LIS, such as

information retrieval, classification, and recommendation systems. AI-powered tools enhance the efficiency and effectiveness of information sharing platforms by providing personalized recommendations, automating repetitive tasks, and extracting insights from vast amounts of data. The modern information environment is mostly driven by ICT. There is a great reliance on new technology advancements in order to supply creative and cutting-edge information services that fulfill the consumers' shifting needs. Libraries must adopt and incorporate cutting-edge technologies, such as artificial intelligence, in order to effectively provide information services that meet the demands of the modern world. Nonetheless, it is alarming that many academic libraries in Nigeria do not fully take use of the advantages of AI for effective service delivery to both local and remote users.

Artificial intelligence applications are now visibly present in almost every aspect of human civilization. It has brought about changes and new competitive advantages in numerous institutions and service organizations. As a result, AI has shown to be extremely useful and advantageous in a variety of industries, including banking and finance, marketing, running healthcare systems, and smart applications (such as facial recognition, voice recognition, location assistant, etc). Like in many other fields as mentioned above, artificial intelligence (AI) may assist libraries in updating and expanding their services and in promoting their relevance in the contemporary digital environment. According to ExLibris (nd), libraries have the ability to utilize the practical benefits of artificial intelligence for their own goals, including streamlining workflows, enhancing operational efficiency, and creating new services. Wood and Evans investigated librarians’ perceptions toward artificial intelligence in 2018 (Barbara, 2018).

There are several avenues for future investigation, based on their work. Their study focused heavily on the use of Supercomputers (like IBM's Watson) in libraries, asking respondents to identify what areas of the library this technology might be implemented and how soon they would expect that implementation. The results are compelling (most respondents believe AI will play a major role in libraries within the next three decades, resource discovery and reference being the most likely areas) (Wood, 2018), but the questions are somewhat limited by defining AI as the researchers did. Furthermore, the study did not provide a strong grounding in the literature or theory of LIS and other fields, with only three references to other resources. This present study offers a more comprehensive look at librarian perspectives toward VR. A recent study by Andrew Cox, Stephen Pinfield, and Sophie Rutter investigated "thought leader" views toward AI and libraries (Cox, 2018).

In the study, the researchers interviewed "33 library directors, library commenters and experts and publishing (Cox, 2018)." The interviewees, in general, expressed optimism about the future of artificial intelligence in libraries in such roles as support within information discovery tools and machine-readable collections, assistance in research production and scholarly communication, and support for teaching and learning. However, the interviewees also expressed some concerns about AI, such as fear of job reduction in libraries, lack of relevant developments within AI for libraries, and privacy and security of data. In March 2019, American Library Association president Loida Garcia-Febo wrote about the emergence of artificial intelligence and budding ways in which it has been used in libraries and related concerns, also noting that "it's clear that while AI can be useful, it also raises familiar concerns about privacy, intellectual freedom, authority, and access (Loida Garcia-Febo, 2019)." From articles like Garcia-Febo's, it is clear that AI has become a topic of interest, confusion, and possibly concern among many in

the field of library and information science. A more detailed understanding about library professionals' feelings about AI, such as that which this study aims to provide, may be useful for education, outreach, and implementation efforts.

2.3.1 AI Tools Used in the Context of Information Exchange

These are software application that uses Artificial Intelligence algorithms to perform specific tasks and solve problems. They include the following:

1. Search Engines with Natural Language Processing: Search engines like Google have incorporated NLP techniques to improve their information retrieval capabilities. These engines now understand natural language queries, enabling users to search for information using more conversational language. NLP-powered search engines use techniques like semantic analysis to grasp the context and intent behind user queries, thus providing more accurate and relevant results.

2. Text Classification and Sentiment Analysis Tools: Text classification tools use AI algorithms to categorize text documents into predefined categories. In the context of information retrieval, these tools can automatically classify documents, making it easier to organize and retrieve information. Sentiment analysis, a subset of text classification, determines the emotional tone of a piece of text, which can be valuable for understanding public opinion or sentiment towards a particular topic

3. Robotics: Robots are programmable machines that can automatically execute actions. It is AI-enabled or automated machine that is configured to complete particular activities with or without human assistance, McCaffrey (2021). Th is AI tool that deals with mechanical device, which carries out automation tasks using artificial intelligence techniques, either directly human control or a predetermined program. This could involve using robotics to retrieve books from shelves,

such as the automatic arm or robots that can take them up from libraries. Robots increase the operational effectiveness of libraries by enhancing collection analysis, visualization, preservation, and lowering service delivery costs. Robots are one of the important tools that are used in information retrieval in libraries. It helps users to find, read and write for specific library users on specific topic from different websites.

4. Big Data: Big data refers to the volume, velocity and variety of data sets, archives or repository that artificial intelligence technologies are using to discover patterns and correlations hidden in massive collections of structured, semi-structured and unstructured data set that has the potential to be mined for information. It is a vast amount of data that traditional storage cannot handle. This is one of the tools AI uses to connect with different libraries, subjects and knowledge management and how to find relevant information materials from different aspect of the knowledge domain.

5. Data Mining: Data mining techniques are analytical tools that can be used to extract meaningful information from a data set. This is a type of indexing system which is derived from Natural Language to identify specific text from large number of web text. Analytic and automatic designs have been used for data mining in AI. An AI-powered indexing tool can automatically assign keywords based on concepts it identifies in a text through content analysis and can help academic library users discover new sources of information from different disciplines, allowing them to find more specific and accurate material to support their research.

6. Chatbot: This is an Artificial Intelligence (AI) software or application that can simulate a conversation (or a chat) with a library user in natural language via a messaging app, a blog, a website, a mobile app, or a smart device. Voice assistants and chatbots can be utilized for library services, (Hopkins, 2018, Mckie, 2019). Chatbots are used in providing 24/7 user services by answering complex and diverse queries, navigating the library website provides personalized

feedbacks and assisting with research by responding to questions from library users and directing them to specific library resources. Chatbots can enable library professionals to increase their efficiency and productivity by responding to difficult questions and save time answering repetitive queries. The difference between chatbots and robots is that chatbots only respond verbally or textually to queries while robots have to show interaction through expressions, movements, verbally and other humanly behaviours.

7. Machine Learning: Machine learning is a type of artificial intelligence that automatically adapt with minimal human interference. Machine learning could be categorized into supervised, unsupervised or deep learning depending on the learning system. Deep learning is a subset of machine learning that uses complex neural networks to mimic or replicate human intelligence. Deep learning models can recognize complex patterns in pictures, text, sounds, and other data sets to produce accurate insights and predictions.

8. Pattern Recognition: Pattern recognition based on prior knowledge or on data from the patterns. Classified patterns typically consist of groups of dimensions or observations that define points in a multi-dimensional space. The application of patter recognition includes image processing, speech and fingerprint recognition, cyber security, Optical Character Recognition (OCR) etc. Components for pattern recognition are data collection, pre-processing, selection of characters, selection of models and training, and evaluation.

9. Expert System: An expert system, a subset of artificial intelligence, is a computer program that imitates human intelligence by replicating human expertise. It is used to design systems with human-like capabilities in various fields. This AI technology simulates the decision-making and actions of human experts, utilizing components such as a knowledge base, inference engine, explanation features, user interface, and knowledge acquisition tools. Its applications span classification, diagnosis, monitoring, process control, design, scheduling, planning, and option

generation. Expert systems are also applicable in libraries for tasks like answering reference questions, offering bibliographic guidance, managing indexing, and enhancing overall management. Each of these AI tools contributes to enhancing the efficiency and effectiveness of information retrieval, making it easier for users to access the information they need from vast amounts of data.

2.4 5G Technologies in LIS profession

The advent of the fifth generation of wireless technology, commonly known as 5G, is transforming the way we connect and communicate. At the heart of this revolutionary leap lies a set of technological foundations that collectively promise to redefine the possibilities of wireless connectivity (Bibri, 2022, Concha Salor & Monzon Baeza, 2023). 5G refers to the fifth generation of broadband data-networking digital communications technology. It is essentially an upgrade to the more popular 4G (fourth generation of broadband data-networking digital communications technology) and aims to improve connectivity not only between individuals but also between computers, objects, and apps (5G–PPP, 2016). Generation is represented by the letter "G," which is commonly associated with cellular networks. 5G is expected to significantly increase mobile network capacity over 4G and previous iterations, allowing more users to connect to the network than ever before (Kliks et al., 2018).

The new 4G standard is 500 times faster than 3G (the third generation of broadband data-networking digital communications technology) and enables more sophisticated activities, such as video sharing and video conferencing (Lemstra, 2018). The most significant difference between 5G and previous iterations is the increased efficiency and decreased latency, which is the time between device transmitting information and a receiver accessing it (Rendón Schneir

et al., 2018). The advent of 5G brings forth unprecedented connectivity, promising faster and more reliable communication. To explore the implications of 5G on information sharing within academic circles, particularly among postgraduate students, is essential for comprehending the technological determinants at play. 5G networks promise ultra-fast data transmission, low latency, and massive connectivity, revolutionizing how information is accessed and shared. In South-West, Nigeria, where internet connectivity and infrastructure may pose challenges, the adoption of 5G technologies can overcome barriers to information sharing, enabling seamless collaboration and communication among LIS postgraduates.

5G provides very high speed, low latency, and highly scalable connectivity between multiple devices and IoT worldwide. 5G will provide a very flexible model to develop a modern generation of applications and industry goals (Kang, 2020). There are many services offered by 5G network architecture are stated below: Massive machine to machine communications: 5G offers novel, massive machine-to-machine communications (Chen, 2017), also known as the IoT (Zhao, 2018), that provide connectivity between lots of machines without any involvement of humans. This service enhances the applications of 5G and provides connectivity between agriculture, construction, and industries (Magsi, 2018). Ultra-reliable low latency communications (URLLC): This service offers real-time management of machines, high-speed vehicle-to-vehicle connectivity, industrial connectivity and security principles, and highly secure transport system, and multiple autonomous actions.

Low latency communications also clear up a different area where remote medical care, procedures, and operation are all achievable (Parvez, 2018). Enhanced mobile broadband: Enhance mobile broadband is an important use case of 5G system, which uses massive MIMO antenna, mm Wave, beam forming techniques to offer very high-speed connectivity across a

wide range of areas (Liu, 2017). For communities: 5G provides a very flexible internet connection between lots of machines to make smart homes, smart schools, smart laboratories, safer and smart automobiles, and good health care centers (Dwivedi, 2024). For businesses and industry: As 5G works on higher spectrum ranges from 24 to 100 GHz. This higher frequency range provides secure low latency communication and high-speed wireless connectivity between IoT devices and industry 4.0, which opens a market for end-users to enhance their business models (Zhang, 2017). New and Emerging technologies: As 5G came up with many new technologies like beam forming, massive MIMO, mm Wave, small cell, NOMA, MEC, and network slicing, it introduced many new features to the market. Like virtual reality (VR), users can experience the physical presence of people who are millions of kilometers away from them. Many new technologies like smart homes, smart workplaces, smart schools, and smart sports academy also came into the market with this 5G Mobile network model (Meunier, 2018).

Smart technology is a set of electronic devices that are connected to other devices or networks through various wireless protocols i.e. Bluetooth, Wifi, 3G, 4G or 5G networks which operates interactively and independently to some extent (Poslad in Azolo, 2019). Bower (2019) in his study defined smart technology as technologies that use machine learning and large-data processing to inculcate intellectual information to items considered previously to be inanimate. In this perspective, smart technologies are all modern ICT facilities equipped with computing power and linked to the internet to assist in providing enhanced library services efficiently. They range from small to medium to wearable devices that can be deployed to library services such as document delivery services, alerting services, acquisition, digital reference services, cataloguing, and circulation among other services.

Libraries have witnessed tremendous transformation as a result of emerging technology (5G), which is eradicating the era of traditional methods of service delivery in developing countries like Nigeria. Emerging technology is a term used to describe novel and evolving technologies that have the potential to have a substantial influence on many organizations, such as libraries. Emerging technologies are tools to expedite user-driven service delivery and are suitable to meet users' demands with quality assurance (Olowofila, 2019). There are many emerging technologies that libraries may use to support user services, education, library management, and technical services. According to Ibrahim (2021), emerging technologies for service delivery in libraries are RFID, communication technologies, electronic information resources, maker space, cloud computing, social networking sites, video conferencing, and integrated library systems. Adoption and usage of emerging technology for service delivery in libraries could enhance the relevancy of the library, promote loyalty, accelerate communication, and save cost and time.

Professionals in the LIS field globally have embraced emerging technologies and are using AI to automate repetitive operations like cataloging and circulation so that librarians may focus more of their time on providing individualized user help (Ajiboye, 2020). The security and validity of digital materials could be improved with block chain technology while ensuring transparent and unchangeable transactions inside library systems (Adetimirin, 2019). Yakubu, Yagana, and Umar (2023) adopted the Theory of Planned Behavior to assess factors that could determine the intention to use emerging technology, such as artificial intelligence for effective service delivery among a population of 242 professionals and para-professional librarians from 3 Federal university libraries in the North-Eastern part of Nigeria. A proportionate stratified random sampling technique was used to draw 119 personnel and Partial Least Square – Structural modeling was used to compute the result of the study. Findings show that variables of the theory

have a positive and significant impact on the personnel's intention to use emerging technology for service delivery in their libraries and that the respondents' intention to use the technology is high.

2.5 Challenges and Opportunities of AI and 5G Technologies

A number of studies have been carried out on Artificial Intelligence in Libraries such as the work done by Akande (2018) on the potentials and limitations of implementing AI technology in libraries. The work highlights the benefits of AI in improving library services, expanding collections, and elevating user experience by automating repetitive tasks like cataloging, reference services, and circulation. However, the author also recognizes the shortcomings of AI, particularly its inability to grasp the complex intricacies of human language and culture. Osuigwe (2020) also explored the potential opportunities and challenges associated with implementing AI technology in libraries located in developing countries, particularly Nigeria in the work titled 'Artificial Intelligence: Opportunities and Challenges for Libraries in Developing Countries,". The work revealed that AI has the capacity to advance library services by providing customized recommendations, expanding library collections, and automating tedious tasks. However, the article also outlines the obstacles of introducing AI in libraries, such as the expensive implementation process, lack of technical proficiency, and apprehensions regarding privacy.

In another related study done by Chikodi and Ezeugoh (2021) on "The Use of Artificial Intelligence in Nigerian Libraries: Opportunities and Challenges," findings from the study revealed that AI has the potential to considerably improve library services by automating repetitive tasks and enriching library collections. However, the article also highlights the

obstacles of implementing AI in libraries, such as limited technical expertise, high costs of implementation, and concerns about privacy. Igwe (2019) also explored the potential impact of AI on library and information services in the future in their article titled "Artificial Intelligence and the Future of Library and Information Services,". The results from the study revealed that AI has the ability to greatly improve library services by providing customized recommendations, augmenting library collections, and automating tedious tasks. However, the article also addresses the challenges that may arise with AI implementation, such as displacement of jobs and privacy concerns. It was recommended that librarians should be equipped the necessary skills to adapt to the evolving technological landscape in order to take advantage of the opportunities and mitigate the risks.

Furthermore, Opara (2021) carried out a study on “Artificial Intelligence and its Implications for Libraries and Information Science Professionals in Nigeria". The work examines the effects of AI on libraries and information science professionals in Nigeria. Findings from the study revealed that AI has the potential to significantly improve library services by automating routine tasks and enhancing library collections. However, some of the challenges identified include: job displacement and the requirement for library professionals to develop new skills and knowledge to adapt to the changing technological environment. Okoro and Ukwoma (2020) conducted a study on "Artificial Intelligence and Library Services in Nigerian Universities: Opportunities and Challenges,” The study investigated the potential advantages and drawbacks of AI implementation in library services of Nigerian universities. Findings from the study revealed that AI has the potential to greatly enhance library services by offering tailored recommendations, augmenting library collections, and automating mundane tasks. Nevertheless, some of the

identified challenges of AI implementation in libraries include: high implementation costs, insufficient technical expertise, and concerns about privacy.

On the same hand, Anunobi and Ejezie (2021) carried out a study on “The Prospects and Challenges of Artificial Intelligence in Nigerian Libraries,". Findings from the study showed that AI can significantly improve library services by providing personalized recommendations, enhancing library collections, and automating routine tasks. However, the article also highlights the challenges of AI implementation in libraries, such as insufficient technical expertise, high implementation costs, and privacy concerns. Nwogu (2021) also carried out a study on the influence of AI on library collections and services in Nigeria. The findings revealed that AI has the potential to notably enhance library services by offering customized recommendations, improving library collections, and automating repetitive tasks. However, the study identified some of the challenges associated with AI implementation in libraries such as job displacement and the necessity for library professionals to acquire new skills and knowledge to adapt to the evolving technological landscape.

Udeogu and Mba (2020) conducted a study on "Artificial Intelligence and Library Services in Nigerian Universities: A Critical Appraisal." The findings of the study revealed that AI has the potential to significantly enhance library services by providing personalized recommendations, augmenting library collections, and automating repetitive tasks. However, the article also brings attention to the challenges associated with AI implementation in libraries, such as high implementation costs, lack of technical expertise, and privacy concerns. McHugh et al. (2018) investigated librarians' perspectives on AI and its potential impact on the profession, and discovered that while librarians generally regarded AI as a valuable tool for improving library services, they also expressed concerns about the possibility of job displacement and the

requirement for retraining to acquire new skills. In another related study, Abubakar (2021) conducted a study on the opportunities and challenges of implementing artificial intelligence in libraries. The findings of the study revealed the potential benefits of AI in enhancing library services, such as improving user experience and facilitating research activities.

However, some of the challenges associated with AI include the need for appropriate training and support for library personnel, ethical considerations, and the possibility of job displacement. The article provides insights and recommendations for library professionals and stakeholders to navigate the opportunities and challenges of AI integration in libraries. On the same note, Ugwu and Eze (2021) examined the potential benefits and drawbacks of AI in libraries in Nigeria. Findings of the study showed that AI has the potential to greatly enhance library services by offering customized recommendations, improving library collections, and automating repetitive tasks. Nevertheless, the article also highlights some of the challenges of AI implementation in libraries, including lack of technical expertise, high implementation costs, and concerns about privacy. Akintunde and Aina (2021) investigate the opportunities and challenges associated with the implementation of artificial intelligence (AI) in the library and information science sector in Nigeria. The study revealed that some of the opportunities of AI in library services include: resource discovery, cataloging, and user services.

However, the study identified some of the obstacles faced by Nigerian library and information science professionals, such as insufficient training, limited funding, and resistance to change. Identifying challenges associated with the integration of AI and 5G in information sharing practices, such as privacy concerns, technical literacy, and infrastructure limitations, will contribute to a nuanced understanding. Concurrently, exploring opportunities presented by these technologies in fostering collaborative knowledge exchange is imperative. Despite the

advancements in AI and 5G technologies, several challenges persist in information sharing among LIS postgraduates in South-West Nigeria. These include limited access to technology and high-speed internet, digital literacy gaps, and lack of awareness about AI-powered tools for information management. Many issues and challenges prevent the full integration of cutting-edge technology, such artificial intelligence, with library and information work. These issues typically arise in Nigerian academic and research libraries. Several of the challenges associated with adopting AI in libraries have been highlighted by CILIP (2021) and other organizations. These include, but are not limited to, copyright and intellectual property rights (IPR), the General Data Protection Regulation (GDPR), the cost of working at scale, the reintegration of project data into systems, a lack of management / executive support, insufficient budget and funding, an inability to keep up with the increasing trend in new technologies, and the challenge of implementing new technologies.

Previous studies by Korinek and Stiglitz (2017) claimed that the development of AI technology may lead to polarization in the workforce or job losses. Automation and the usage of AI may lead to a huge rise in inequality. Mensah (2024) asserts that developing countries may be less inclined to accept technology due to the likelihood that it will result in significant job losses. According to the estimate, the adoption of AI will lead to job losses in India of 69%, Thailand of 72%, China of 77%, and Ethiopia of 85%. These studies show that AI has the potential to cause major employment destruction as well as job losses. Using artificial intelligence in academic libraries presents a number of difficulties, according to Yusuf et al. (2022), including a lack of suitable infrastructure, increasing skill gaps, job loss, an unpredictable power supply, and an increase in the number of alternative sources of information. Nevertheless, the adoption of artificial intelligence would reduce the need for human involvement in a number of library tasks.

To leverage the potential of AI and 5G technologies for effective information sharing, universities and stakeholders can implement various strategies. These include investing in infrastructure development to improve internet connectivity, integrating AI-driven tools into LIS curriculum, providing training and capacity building programs on digital literacy and information management technologies, and fostering collaborations with industry partners to facilitate technology adoption.

2.5.1 Benefits of Artificial Intelligence in Libraries

Some of the advantages of AI in libraries include the following:

1. Easy Library Automation: AI helps to automate processes and repetitive tasks and reduce the time it takes to analyze big data sets. This helps to save time and resources by eliminating the need for employees to perform tedious and repetitive tasks.

2. Saves Labour and Increases Productivity: An example here is the use of warehouse automation, which grew during the pandemic and is expected to increase with the integration of AI and machine learning.

3. Improve Customer Satisfaction through Personalization: AI can personalize content, messaging, ads, recommendations and websites to library users. AI-powered tools can provide personalized learning experiences to students.

4. Easy Availability and Accessibility of Information: AI-powered virtual agents are always available. AI programs do not need to sleep or take breaks, providing 24/7 service.

5. Collaboration and Knowledge Sharing: AI facilitates collaboration and knowledge sharing among Librarians and library users. For example, AI-powered platforms can connect users with similar research interests, facilitating interdisciplinary collaborations and fostering a sense of community within the academic environment.

6. Increase Operational Efficiency: Improve the effectiveness of library services and ultimately reduce operational costs with sustainable libraries.

7. Virtual Assistance and Chatbots: AI-powered chatbots can offer immediate assistance to library users, answering research questions and guiding users to relevant resources.

2.5.2 Challenges of the Application of AI in Academic Libraries in Nigeria

Artificial intelligence systems are generally not in functional use in most libraries in developing countries. The limitations to implementing artificial intelligence systems in these libraries may include the following:

1. Poor ICT Skills and Technical Expertise among Library Staff: Skill gap and poor technical expertise among library professionals could pose a serious challenge in effective applications and use of AI technologies in Academic libraries in Nigeria. Without proactive training and retraining of librarians to adapt to the changing technological landscape, AI implementation in libraries in Nigeria may be near impossible.

2. Financial Constraints: Academic libraries in Nigeria operate with poor library budget and the cost of implementing AI can be very high. This could make it practically difficult to effectively deploy AI technologies in libraries as every other challenge is invariably connected to lack of fund.

3. Poor Content Digitization Process: Most academic libraries in Nigeria are still facing the challenges of digitizing their local contents which are mainly in physical formats. To leverage AI effectively, libraries need to digitize their resources. However, due to financial limitations and other constraints, the digitization process has been facing a lot of challenges.

4. Phobia for Job Displacement: Job displacement is a potential challenge in implementing AI tools in academic libraries in Nigeria. AI technologies are capable of automating routine library operations and services such as cataloguing, inventory management and customer services, which could lead to reduced staff need.

5. Privacy and Ethical Issues: Ethical considerations of AI technologies raise a lot of concerns, such as privacy and data protection. Libraries in Nigeria may face additional challenges in ensuring that these ethical considerations are addressed, given limited understanding about open access to resources. Hence, there is need to ensure that information and data are protected and ethical considerations are adhered to when implementing AI systems.

6. Poor Maintenance Culture: One of the very big challenges of ICT development in libraries in Nigeria is poor maintenance culture. Most ICT facilities in libraries in Nigeria do not work effectively due to neglect and poor maintenance culture.

7. Epileptic Power Supply: Poor and irregular electric power supply in Nigeria has been a major challenging factor that renders most ICT facilities in the library unusable and a state of moribund. There is need for improvement and building alternative power supply such as solar energy resources for effective implementation.

8. Poor Infrastructure and Technological Development: Most academic libraries in Nigeria lack the necessary infrastructure and technology to support the implementation of AI. Without a well-established infrastructure and technological development, the application of AI in academic libraries in Nigeria may be a mirage.

9. Poor Network Connectivity: The bane of successful AI implementation in academic libraries in Nigeria is poor bandwidth for network connectivity. Poor bandwidth in libraries results to very low internet connectivity which makes it difficult to access and download the require datasets.

Robust internet connections and advanced computing systems are vital for implementing AI in libraries, but these are not readily available in Nigeria.

10. Resistance to Change: Introducing AI in academic libraries may face resistance from staff and users who are not familiar or comfortable with new technologies. Some users as well as library staff may prefer traditional services or may find it difficult to adapt to new technologies. This resistance can hinder the successful implementation and adoption of AI technologies. The application of AI in academic libraries in Nigeria may face resistance or limited adoption due to cultural attitudes, reluctance to change among library staff. Overcoming resistance and ensuring the adoption of AI technologies can be a significant challenge in developing countries.

2.6 Appraisal of the Reviewed Literature

The studies on AI and 5G technologies as determinant of effective information sharing among LIS postgraduate students in Kwara State, Nigeria have a relatively short history spanning over three decades. Several aspects of students 'interactions with AI and 5G technologies, such as the extent of their accessibility, impact, role and ease of use of AI and 5G technologies were touched in this study. However, there are several unexplored questions providing researchers with fertile grounds for future studies. Even at that, most of the previous studies were done in developed countries; hence, not many of them have been carried out in developing countries like Nigeria. More so, the literature revealed a mixed position on the current situation as it concerns the determinants of the use of AI and 5G technologies by university postgraduate's students in general and very little research on the use of AI and 5G technologies by LIS postgraduate's students mainly from the Nigerian perspective.

From the scarce literature available, many of them were obsolete and did not reveal the present status on the use of AI and 5G technologies by tertiary students. It is therefore imperative for the researcher to embark on this study as no substantial evidence of literature in Nigeria has been recorded concerning the determinants of the use of AI and 5G technologies by LIS postgraduate students in universities in Kwara State, Nigeria. This is the gap in knowledge that this study hopes to fill.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This section highlights the methodology to be use in the study. It also explains the research design, population of the study, sampling technique, method of data collection and method of data analysis using universities in Kwara State, Nigeria as a case for observation. The sub-headings are as follows: Research Design; Population of Study; Sample and Sampling Technique; Research Instrument; Validation and Reliability of Instrument; Method of Data Collection; Method of Data Analysis and Ethical Consideration.

3.2 Research Design

A quantitative method approach will be adopted. This design allows for a holistic understanding of the intricate relationship between AI tools, 5G technologies and information sharing among postgraduate students. This study will adopt the descriptive research design. Descriptive survey design has to do with research that is interested in describing scenarios and variables that are connected to the phenomena and the problem(s) or situation(s) under study. According to Chiodo (2024) research design represents the way(s) a scholar structures his/her research work. Two variables identified in the study namely, dependent and independent variables. The independent variable identified in the study is AI and 5G technologies. The two dependent variables that were identified in the study were information sharing and LIS postgraduate students. The study is designed to assess the impact of AI and 5G technologies on the effective information sharing among LIS postgraduate's students in conditions where the students involved, own and use AI and 5G technologies and have access to these technologies.

3.3 Population of the Study

The population of this study will consist of all Library and Information Science postgraduate students in universities across Kwara State, Nigeria. A random sampling technique was utilized to ensure representation from various institutions within the state. Scientific research, particularly as done in the social sciences, revolves around identified study population.

Table 3.1: Study Population

S/N	Name of University	No of Students
1.	University of Ilorin, Ilorin	112
2.	Kwara State University, Malete	16
3.	Al-Hikmah University, Ilorin	28
Total		**156**

3.4 Sample Size and Sampling Technique

The sample size for the study consists of all the 156 postgraduate students from the three universities offering Library and Information Science at postgraduate level in the state. The total enumeration sampling technique was employed for this study. The entire population was therefore used because of the relatively small size of the population. According to Olaitan and Nwoke (1988), when the research involves a population of very few or few subject, the entire population can be used for the study.

3.5 Research Instrument

The instrument for data collection in the study is the questionnaire titled, “Leveraging Artificial Intelligence Tools and 5G Technologies to Enhance Effective Information Sharing among LIS Postgraduate Students in Kwara State, Nigeria”. It was designed by the researcher and consist of four sections; A, B, C and D. Section A is designed to obtain information on the bio-data of the

respondents; Section B – D is designed to elicit information on the study's objectives from the LIS postgraduate students.

3.6 Validity and Reliability of the Instrument

The instrument was submitted for face and content validation to the project supervisor. The correction and observation were incorporated before the final draft of the instrument. To establish the reliability of this instrument, the test-retest method of reliability was used to determine the consistency of the opinion of the respondents on AI and 5G technologies as determinants of effective information sharing among Library and Information Science postgraduate students Questionnaire. The responses scales were pilot tested on a sample of 30 postgraduate students from the Department of Library and Information Science, Kwara State University, Malete. Thirty (30) copies of the questionnaire were administered to the LIS postgraduate students. After two weeks, same instrument was re-administered to the same group and the result was compared using Pearson's Product Moment Correlation Coefficient, *r*, (PPMC). A reliability coefficient of 0.73 was obtained and considered adequate for the study.

3.7 Method of Data Collection

Copies of the questionnaire was sent out to the target respondents in the three Library and Information Science Departments schools in the selected universities in Kwara State. The copies of the questionnaire were immediately retrieved. This method was preferred so as to enable the researcher achieve a high response rate and to reduce overhead costs.

3.8 Method of Data Analysis

The data collected were analyzed using descriptive statistics of frequency and percentage for all research questions using the IBM Statistical Product and Service Solution (SPSS) software version 26.0. The descriptive statistics includes the frequency counts, percentages, mean and standard deviation. Tables will be used for results presentation and interpretation.

3.9 Ethical Considerations

The study employed the anonymity ethical consideration and follow all the ethics guiding scholarly writing by ensuring the work is original. According to Mugenda and Mugenda (2003), anonymity refers to keeping secret by not identifying the ethnic or cultural background of respondents, refrain from referring to them by their names or divulging any other sensitive information about a participant. This is why, during study, the researcher must promise to protect the information given in confidence by the respondent. But, if any information has to be revealed, then consent must be sought from the respondent(s).

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION OF RESULTS

4.1 Introduction

This chapter presents and analyses the data presented through primary source. Data collected through questionnaires are presented in tables and analyzed using frequency counts and percentages. The results are presented based on the variables focused in the research objectives. Also in this chapter, the major findings of the study are further highlighted.

4.2 Bio-data of the Respondents

Table 4.1: Bio-data of the Respondents

Gender	**Frequency**	**Percentage**
Male	92	59.0
Female	64	41.0
Total	**156**	**100.0**
Age	**Frequency**	**Percentage**
20-25 years	11	7.1
26-30 years	57	36.5
21-35 years	69	44.2
36 years and above	19	12.2
Total	**156**	**100.0**
Marital Status	**Frequency**	**Percentage**
Single	61	39.1
Married	95	60.8
Total	**156**	**100.0**
Level	**Frequency**	**Percentage**
MLIS	90	57.6
PhD	66	42.3
Total	**156**	**100.0**

From table 4.1, it was observed that out of 156 respondents 92 which represent 59 % of the respondents were male while 64 which represent 41% of the respondents were female. This shows that most of the respondents were males. It is also observed that out of 156 respondents, 11.0 which represents 7.1 % of the respondents fell into the age bracket of 20-25 years, 57.0 which represents 36.5% of them fell into the age bracket of 26-30, while 69.0 which represents 44.2% of them fell into the age bracket of 31-35 years and 19.0 respondents which represents 12.2% of them fell into the age bracket of 36 years and above. This shows that most of the respondents were within the age range of 31-35 years. 95(60.8%) of the respondents were married and 61(39.1%) were single at the time of conducting the study. In the level of study, 90(57.6%) were Masters students and 66(42.3%) were enrolling for PhD program.

4.3 Analyses of the Research Questions

Research Question 1: What is the level of awareness of AI tools and 5G technologies among LIS postgraduate students in Kwara State?

Table 4.2: The level of awareness of AI tools and 5G technologies among LIS postgraduate students.

ITEMS	SA (%)	A (%)	D (%)	SD (%)
I am familiar with the capabilities and limitations of AI tools.	67(42.9)	42(26.9)	23(14.7)	24(15.4)
Do you comprehend with the underlying technology and Algorithms of AI tools.	65(41.7)	57(36.5)	23(14.7)	10(6.4)
Are you aware of the Ethical Consideration of AI tools.	70(44.9)	32(20.5)	24(15.4)	29(18.6)
Are you familiar with the capabilities and limitations of 5G technologies.	62(39.7)	36(23.1)	21(13.5)	33(21.2)
5G technologies are being used and integrated into work-flows and process.	36(23.1)	62(39.7)	33(21.2)	21(13.5)
Are you proficient in using 5G technologies for Information Sharing.	67(42.9)	42(26.9)	24(15.4)	23(14.7)

Table 4.2 reveals the level of awareness of AI tools and 5G technologies among LIS postgraduate students. These include: “Are you aware of the Ethical Consideration of AI tools” with 70(44.9); “I am familiar with the capabilities and limitations of AI tools” and “Are you proficient in using 5G technologies for Information Sharing” with 67(42.9) respectively. Also “Do you comprehend with the underlying technology and Algorithms of AI tools” with 65(41.7). This implies that the respondents are very much aware of AI tools and 5G technologies for information sharing among themselves.

Research Question 2: What are the AI tools commonly used for information sharing by LIS postgraduate students in Kwara State?

Table 4.3: The AI tools commonly used for information sharing by LIS postgraduate students.

ITEMS	SA (%)	A (%)	D (%)	SD (%)
Text-to-Speech (TTS)	37(23.7)	69(44.2)	27(17.3)	23(14.7)
Speech-to-Text (STT)	42(26.9)	67(42.9)	24(15.4)	23(14.7)
Augmentative and Alternative Communication (AAC)	10(6.4)	23(14.7)	57(36.5)	65(41.7)
Screen Readers	29(18.6)	32(20.5)	24(15.4)	70(44.9)
Document Scanners	62(39.7)	36(23.1)	33(21.2)	21(13.5)
Digital Note-taking Tools	24(15.4)	29(18.6)	70(44.9)	32(20.5)

Table 4.3 highlight the AI tools commonly used for information sharing by LIS postgraduate students in Kwara State. These AI tools include: Document Scanners with 62(39.7) ‘Strongly Agreed’. Text-to-Speech (TTS) with 69(44.2) of ‘Agreed’ follows by Speech-to-Text (STT) with 67(42.9) of ‘Agreed’ as well. However, Screen Readers has 70(44.9) of ‘Strongly Disagreed’ follows by Augmentative and Alternative Communication (AAC) with 65(41.7) of ‘Strongly Disagreed’ as well. Digital Note-taking Tools has 70(44.9) of ‘Disagreed’. This implies that the respondents don’t really use much of AI tools for information sharing.

Research Question 3: What is the frequency of use of AI tools and 5G technologies for effective information sharing among LIS postgraduate students in Kwara State?

Table 4.4: The frequency of use of AI tools and 5G technologies for effective information sharing among LIS postgraduate students.

ITEMS	Frequency	Percentage
Daily	14	9.0
Several Times a Week	5	3.2
About Once a Week	5	3.2
Several Times a Month	131	84.0
Rarely	1	0.6

Table 4.4 reveal the frequency of use of AI tools and 5G technologies for effective information sharing among LIS postgraduate students. 131 respondents representing 84.0% said they use AI tools and 5G technologies several times a month. Follows by 14(9.0%) agreed they use AI tools and 5G technologies daily. Furthermore, several time a week and about once a week has 5(3.2%) respectively while 1(0.6%) use AI tools and 5G technologies rarely. This implies that the respondents don't really use AI tools for effective information sharing.

4.4 Discussion of Findings

The findings of this revealed that the level of awareness of AI tools and 5G technologies among LIS postgraduate students such as "Are you aware of the Ethical Consideration of AI tools", "I am familiar with the capabilities and limitations of AI tools", "Are you proficient in using 5G technologies for Information Sharing", Do you comprehend with the underlying technology and Algorithms of AI tools". This is in line with the statement of Rosa (2024) that it is unarguable that technological and other societal changes have substantially impacted Library and Information Science (LIS) education worldwide. Literature has revealed that the most evident and measurable changes in LIS education are traceable to curricula and academic library services.

Furthermore, the findings of this study highlight the AI tools commonly used for information sharing by LIS postgraduate students in Kwara State such as Document Scanners, Text-to-Speech (TTS), Speech-to-Text (STT). This is supported with statement of Kalogiannakis and Papadokis (2017) that the advantages learners derive from AI and 5G technologies because of AI and 5G technologies' ability to support learning and access to information without temporal-spacial restrictions. However, Screen Readers, Augmentative and Alternative Communication (AAC), Digital Note-taking Tools. This is also supported with the statement of Olowofila (2019) that emerging technologies are tools to expedite user-driven service delivery and are suitable to meet users' demands with quality assurance.

Finally, the findings of this study reveal the frequency of use of AI tools and 5G technologies for effective information sharing among LIS postgraduate students. Most of the respondents use AI tools and 5G technologies several times a month. Some use AI tools and 5G technologies daily. This is in corroboration with the statement of Bowler et al. (2018) that users were motivated by the possibility that AI and 5G technologies have the ability to change the ways youths seek information. Similarly, Chang and Zimmermaman (2019). Chang and Zimmermaman (2019) were interested in assessing the exact ways AI and 5G technologies are impacting and changing information behavior of information users.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOOMENDATIONS

5.1 Introduction

This chapter presents the summary, conclusions and recommendations of the study in line with the objectives of the study. Covered in this chapter are also conclusion and recommendations. Lastly, the chapter provides possible areas for further studies that were outside the scope of this study.

5.2 Summary

The research design for this study was the descriptive survey of awareness of AI tools and 5G technologies among library and information science (LIS) postgraduate students in Kwara State. The population of the study consists of 156 Library and Information Science postgraduate students in universities in the state. The 156 postgraduate students became the sample for the study. Four research questions were raised for this study. Instruments administered were retrieved. The data collected were analyzed using descriptive statistics of frequency and percentage. The findings of this study showed that:

i. The LIS postgraduate students in universities in Kwara State make were highly aware of AI tools and 5G technologies;
ii. The LIS postgraduate students make use of some AI tools and 5G technologies such as Document Scanners, Text-to-Speech (TTS), Speech-to-Text (STT) for effective information sharing; and

iii. The majority of LIS postgraduate students use AI tools and 5G technologies several times a month.

5.3 Conclusion

It is very evident from the study that the awareness of AI tools and 5G technologies by LIS postgraduate students in Kwara State were very high. The high percentage of LIS postgraduate students in the universities that makes Document Scanners, Text-to-Speech (TTS), Speech-to-Text (STT) for effective information sharing. The study concluded that there is a potential positive usage of AI tools and 5G technologies for effective information sharing.

5.4 Recommendations

Based on the findings of this study, the following recommendations were made:

i. The LIS postgraduate students should make use of more AI tools and 5G technologies for effective information sharing.
ii. The LIS postgraduate students should be taught the emerging technologies irrespective of their level.
iii. Government should equip universities with adequate and functional infrastructure that will encourage the usage of AI tools and 5G technologies for effective information sharing.
iv. Lastly, similar research should be conducted in other states to bring about the awareness of the importance of the usage of AI tools and 5G technologies for effective information sharing.

References

Abubakar, A. (2021). Artificial intelligence and libraries: Opportunities and challenges. *Information and Knowledge Management, 11*(1), 1-13.

Aderibigbe (2024). A survey of 5G network: Architecture and emerging technologies. *IEEE Access, 3*, 1206–1232.

Ahmed (2024). Impact of Mobile Technologies on Students Learning: The Teachers Perspective. Retrieved March 2016, from United Nations Educational, Scientific and Cultural Organization (UNESCO). http://www.unesco.org

Akbulut (2024). Gender differs: assessing a model of online purchase intentions in e-tail service. *International Journal of Service Industry Management, 16*(5), 416-435.

Akintunde, S., & Aina, L. (2021). Artificial intelligence and library and information science professionals in Nigeria: Opportunities and challenges. *Information and Knowledge Management, 11*(1), 14-24.

Andrew M., Stephen P., and Sophie R. (2019). The Intelligent Library: Thought Leaders' View on the Likely Impact of Artificial Intelligence on Academic Libraries. *Library Hi Tech 37*(3), 418–35.

Asemi, A., & Asemi, A. (2018). Artificial intelligence (AI) application in library systems in Iran: A taxonomy study. *Library Philosophy and Practice (e-journal).* http://digitalcommons.unl.edu/libphilprac/1840/

Banerjee, M. S. (2022). Application, advantage, and disadvantage of artificial intelligence in library services. *International Journal of Creative Research Thoughts, 10*(11). www.ijcrt.org

Barbara (2018). *How People Learn: Brain, Mind, Experience, and School*: Expanded Edition. Washington, D. C.: National Academy Press.

Benbba (2024). Machine-to-machine communications in ultra-dense networks: A survey. *IEEE Communication Survey., 19*, 1478–1503.

Bouthillier (2024). Availability and use of information and communication technology (ICT) in six Nigerian university library schools. *Library Philosophy and Practice.* Retrieved from http://unllib.unl.edu/LPP/bappah-abubakar.pdf

Bowler, L., Julien, H., & Haddon, L. (2018). Exploring youth information-seeking behavior and mobile technologies through a secondary analysis of qualitative data. *Journal of Librarianship and Information Science, 50*(3), 322-331.

Cabani (2024). Artificial Intelligence Application in Library Systems in Iran: A Taxonomy Study. *Library Philosophy and Practice:* 1840, https://digitalcommons.unl.edu/libphilprac/1840.

Chan, C. & Yang, Y. (2019). Revisiting the effects of project-based learning on students' academic achievement: a meta-analysis investigating moderators. *Educational Research Review, 26,* 71-81.

Chang, H. & Zimmerman, T. (2019). Navigating the role of mobile technologies in shaping information behavior: a meta-synthesis. ALISE Juried Papers. Available on: hdl.handle.net/2124/105320 Accessed on: March 4, 2020.

CILIP (2021). Internet use in Israeli universities: a case study**.** *IFLA Journal, 35* (4), 313.

CILIP Research Report (2021). The impact of AI, machine learning, automation and robotics on the information professions. London: CILIP: The Chartered Institute of Library and Information Professionals; 2021. https://doi.org/10.56294/dm202336

Cioff et al. (2020). Internet access and usage by students of the college of medicine, University of Lagos. *The Information Technologist, 1*(1&2), 81–87.

Cox, A. M., Pinfield, S. & Rutter, S. (2019). The intelligent library. *Library Hi Tech, 37*(3). 418-435. https://doi.org/10.1108/LHT-08-2018-0105

Cui, W., Xue, Z., & Thai, K. P. (2019). Performance comparison of an AI-based adaptive learning system in China. Proceedings 2018 Chinese Automation Congress, CAC 2018. DOI:10.1109/CAC.2018.8623327

Deakin University (2014). 5G network-based Internet of Things for demand response in smart grid: A survey on application potential. *Application Energy, 257,* 113972.

Devrari (2024) 5G and Information and communication literacy among practicing librarians in Delta State. *The Information Manager, 6*(1&2), 1 – 10.

Diaz, M. (2023). What is AI? Everything to know about artificial intelligence https://www.zdnet.com/article/what-is-ai-heres-everything-you-need-to-know-aboutartificial-intelligence/

Duggal, N. (2023). What is artificial intelligence: Types, history, and future. https://www.simplilearn.com/tutorials/artificial-intelligence-tutorial/what-is-artificialintelligence#:

Dwivedi (2019). Nebraska high school students 'computer skills and attitudes. *Journal of Research on Computing in Education, 33*(3), 316-326.

Dwivedi (2024). *5G and Awareness of expected skills sets and development required by new era librarians in Academic Libraries in South Eastern Nigeria. Information for all: Strategies for national development*. Nigerian Library Association 49th National Conference and Annual General Meeting, Awka: University Press.

Fernandez, P. (2016). Through the looking glass: envisioning new library technologies: how artificial intelligence will impact libraries. Library Hi Tech News, 33(5), 5-8.

Gao, M., Zhang, X., & Huang, Y. (2021). The application of artificial intelligence in libraries: An overview. In: Proceedings of the 2021 5th International Conference on E-Society, EEducation and E-Technology (ICSET 2021), 86-91.

Gao, X., Zhang, Y., Liu, Y., & Li, Y. (2021). Application of artificial intelligence in library cataloging: A review. *Data Technologies and Applications, 55,* 35-44.

Haenlein and Kaplan (2019). *Introduction to statistics and data Analysis.* New York: Springer.

Hayani et al. (2021). What stops teachers using new technology? In M. Leask (Ed.), *Issues in Teaching Using ICT* (61-79). London: Routledge.

Hopkins, P. & Maccabee, R. (2018). Chatbots and digital assistants–Getting started in FE and HE (Report.) 2018.

ICAL– Delhi, India Vijayakumar & Sheshadri, (2019). Applications of Artificial Intelligence in Academic Libraries. *International Journal of Computer Sciences and Engineering.* https://www.google.com/search?q=Artificial+Intelligent+Component+Diagram&oq. DOI: 10.26438/ijcse/v7si16.136140

Igwesi, U. (2010). Globalization and entrepreneurship: challenges and opportunities for Nigerian libraries. *International Journal of Education Research, 10*(3), 226-234

Kalogiannakis, M. & Papadakis, S. (2017). Combining mobile technologies in environmental education: a Greek case study. *International Journal of Mobile Learning and Organization, 11*(2), 108-130.

Kankanamge, C., & Wickramasinghe, D. (2020). Utilization of artificial intelligence in academic libraries: Opportunities and challenges. *Journal of Advances in Librarianship, 14*(1), 28-37.

Kankanamge, C., & Wickramasinghe, A. (2020). Artificial intelligence in academic libraries: A review. *Library Hi Tech, 38*(2), 339-350.

Kuo, T. H. (2020). The current situation of AI foreign language education and its influence on college Japanese teaching. Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics). 12193: 315– 324).

Liu (2024). 3-D-MIMO with massive antennas paves the way to 5G enhanced mobile broadband: From system design to field trials. IEEE J. Sel. Areas Commun., 35, 1222–1233.

Liu, X., Li, M., & Jin, B. (2018). The application of artificial intelligence in academic libraries. *Journal of Library and Information Science, 44*(2), 46-55.

Loida G. (2019). New directions of ICT-use in education: *UNESCO's World Communication and Information Report*. University of Hong Kong.

Makinen, J. (2024). 5G and An Analysis of ICT impact on the curricular of major Nigerian universities in the last ten years (2003-2013). *International Journal of Science and Technology, 3*(1), 1 – 7.

Marlini (2020). The influence of specific computer experiences on computer self- efficacy beliefs. *Computers in Human Behavior, 19,* 443-450. doi: 10.1016/S0747-5632(02)00079-1

McCaffrey, C. (2021). Planning and implementing an automated storage and retrieval system at the University of Limerick. In: Atkinson J. (ed). Technology, Change and the Academic Library. Chandos Publishing; 143-50. https://doi.org/10.1016/B978-0-12-822807- 4.00014-2.

McHugh, M., Buckley, K. & Hill, B. (2018). Artificial intelligence and the future of libraries: An exploratory survey of librarian's perspectives. *College & Research Libraries*, *79*(5), 631-648.

McHugh, M., Bolognese, M. & Johnson, C. (2018). Librarians' perceptions of artificial intelligence and its potential impact on the profession. *The Journal of Academic Librarianship, 44*(6), 733-741. doi: 10.1016/j.acalib.2018.09.005.

Mckie, I. & Narayan, B. (2019). Enhancing the academic library experience with chatbots: An exploration of research and implications for practice. *Journal of the Australian Library and Information Association,* 68:268-77. https://doi.org/10.1080/24750158.2019.1611694.

Nwakunor, J. A. (2021). *Leveraging artificial intelligence to enhance brand management.* The Guardian Newspaper.

Nwogu, F. (2021). The impact of artificial intelligence on library collections and services in Nigeria. *Journal of Library and Information Science*, *19*(1), 32-43.

Ohaeri, T., & Nwogu, F. (2021). Perceptions of artificial intelligence in Nigerian academic libraries: A Survey. *Journal of Academic Librarianship, 47*(5), 102454.

Okoro, O., & Ugwu, C. (2020). The role of artificial intelligence in library and information science education in Nigeria. *Library Philosophy and Practice (e-journal),* 1-15.

Okoro, O., & Ukwoma, S. (2020). Artificial intelligence and library services in Nigerian Universities: Opportunities and challenges. *Library Philosophy and Practice (e-journal),* 1-14.

Oladokun, U. (2024). University students 'differences on attitudes towards computer use: comparison with students 'attitudes towards physical activity. *Interactive Educational Multimedia*, *17*(1), 20- 28.

Oloo, R. (2024). Development of modern ICT and internet system. In A. A. Agagu (ed). *Information and Communication Technology and Computer Applications.* Abuja: Panof Press, 1– 3.

Opara, J. C. (2021). Artificial intelligence and its implications for libraries and information science professionals in Nigeria. *International Journal of Library Science and Research, 11*(1), 1- 10.

Pandey, K. (2024). A survey on interference management for device-to-device (D2D) communication and its challenges in 5G networks. *Journal Networking and Computer Application, 71*, 130–150.

Parvez, G. (2018). Implementation of modified team-based learning within a problem-based learning medical curriculum: a focus group study. *BMC Medical Education, 18*(1), 74. Cambridge Massachusetts: The MIT Press.

Phan, H. (2024). A survey on mobile edge networks: Convergence of computing, caching and communications. *IEEE Access, 5*, 6757–6779.

Pirbhula, F. (2024). 5G technologies in Critical empirical research in IS: an example of gender and the IT workforce. *Information Technology & People, 19*(3), 272-292.

Qin, I. (2024). Institutional factors as predictors of students' academic achievement in Colleges of Education in South Western Nigeria. *International Journal of Educational Administration and Policy Studies, 6*(8), 141-153. Retrieved from http://www.academicjournals.org

Read, L. (2024). Mobile Application and Its Global Impact. *International Journal of Engineering & Technology*, *10*(6), 72-78. Retrieved from http://www.ijens.org

Rosa, Y. (2024). 5G and Perspective of emerging integrating technology (ICT) in learning and teaching. *International Journal of Information and Education Technology, 3*(2), 282-285.

Udeh, E. I., & Asogwa, K. C. (2020). Artificial intelligence and academic libraries: Perceptions and challenges of librarians in Enugu State. *Library Philosophy and Practice (e-journal)*, 1-12.

Udeogu, C. U., & Mba, E. U. (2020). Artificial intelligence and academic libraries: A review of the literature. *International Journal of Library Science and Research, 10*(2), 9-20.

Yu, K., Gong, R., Sun, L. & Jiang, C. (2019). The application of artificial intelligence in smart library. *Advances in Economics, Business and Management Research.* https://www.atlantis-press.com/article/125919402.pdf

APPENDIX

QUESTIONNAIRE ON:

LEVERAGING ARTIFICIAL INTELLIGENCE TOOLS AND 5G TECHNOLOGIES TO ENHANCE EFFECTIVE INFORMATION SHARING AMONG LIS POSTGRADUATE STUDENTS IN UNIVERSITIES IN KWARA STATE, NIGERIA

Dear respondent,

I am a student in the Department of Library and Information Science, Institute of Information and Communication Technology, Kwara State Polytechnic, Ilorin. I am currently undertaking research project titled: *"Leveraging Artificial Intelligence Tools and 5G Technologies to enhance effective Information Sharing among LIS Postgraduates Students in Universities in Kwara State"*. I therefore, request you to kindly provide your opinions to the questions as contained in the attached questionnaire. Information provided in this questionnaire will be held confidential and used for research purpose only.

Your quick response will be highly appreciated.

Thanks for your anticipated cooperation.

ABIODUN, Khadijat Olashile
Researcher

SECTION A:

Bio-data of Respondents

Instruction: *Please tick (√) the options you deem appropriate*

Gender: Male [ ] Female [ ]

Age: Under 20 [ ] 20-25 [ ] 26-30 [ ] 31-35 [ ] 36 and above [ ]

Name of Institution: …….....

Level of Study: Masters [ ] Ph.D [ ]

Marital Status: Single [ ] Married [ ]

SECTION B:

What is the level of awareness of AI tools and 5G technologies among LIS postgraduate students in Kwara State?

Instruction: For each of the statements below, indicate (√) the option you deem as appropriate: Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD).

S/N	ITEMS	SA	A	D	SD
1.	I am familiar with the capabilities and limitations of AI tools				
2.	Do you comprehend with the underlying technology and Algorithms of AI tools				
3.	Are you aware of the Ethical Consideration of AI tools				
4.	Are you familiar with the capabilities and limitations of 5G technologies				
5.	5G technologies are being used and integrated into work-flows and process				
6.	Are you proficient in using 5G technologies for Information Sharing				

SECTION C:

What are the AI tools commonly used for information sharing by LIS postgraduate students in Kwara State?

Instruction: For each of the statements below, indicate (√) the option you deem as appropriate: Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD).

S/N	ITEMS	SA	A	D	SD
1.	Text-to-Speech (TTS)				
2.	Speech-to-Text (STT)				
3.	Augmentative and Alternative Communication (AAC)				
4.	Screen readers				
5.	Document Scanners				
6.	Digital Note-taking tools				

SECTION D:

What is the frequency of use of AI tools and 5G technologies for effective information sharing among LIS postgraduate students in Kwara State?

ITEMS	YES	NO
Daily		
Several Times a Week		
About Once a Week		
Several Times a Month		
Rarely		