ACADEMIC STAFF PROFICIENCY IN UTILIZING ARTIFICIAL INTELLIGENCE FOR RESEARCH MANAGEMENT IN PUBLIC UNIVERSITIES IN ANAMBRA STATE: CHALLENGES AND IMPROVEMENT STRATEGIES

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Abstract

The poor utilization of digitalized technologiessuch as Artificial Intelligence by academic staff for research management in public universities in Anambra State, warranted the present study. The study examined academic staff proficiency in utilizing Artificial Intelligence (AI) technology for their research management in public universities in Anambra State: challenges and improvement strategies. Three research questions guided the study. A descriptive survey research design was employed in the study. Population for the study constituted a total of 2,588 academic staff (that is; 1,990 Federal-owned university & 598 State-owned university) from two public universities in Anambra State. Sample size of the study comprised518 academic staff(breakdown is; 398 Federal-owned& 120 State-owned) selected at 20% from the entire academic staff population of these two public universities using the simple random sampling technique. A 24-item researcher-developed questionnaire titled: "Academic Staff AI Proficiency for Research Management, Challenges and Improvement Strategies Questionnaire (ASAIPRMCIS)" and structured on a 4-point scale of Highly Proficient (HP), Proficient (P), Less Proficient (LP) and Not Proficient (NP); including Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) was used for data collection. The ASAIPRMCIS was face validated by three experts from the Department of Educational Management and Policy, and one Measurement and Evaluation expert from the Department of Educational Foundations, Nnamdi Azikiwe University, Awka. Reliability of the research instrument was established through a pilot-test conducted on a sample of 25 academic staff from two public universities in Enugu State. Data collated after the pilot test were measured using Cronbach Alpha statistics which gave internal consistency reliability of 0.79, 0.81 and 0.73 for the three clusters respectively; and were summed up to give an overall coefficient r-value of 0.78, indicating that the instrument was reliable. Data collated were analyzed using mean scores rated at 2.50 and standard deviation statistics. Findings of the study revealed among others that academic staff of the public universities in Anambra State were not proficient in utilizing Artificial Intelligence (AI) for their research management. It was also found out that some challenges hindered academic staff proficiency in utilizing Artificial Intelligence (AI) for their research management. From the findings, recommendations were proffered and among them included that the public universities in Anambra State through financial support from the government and National Universities Commission (NUC) should implement continuous comprehensive training programmes focused on AI applications through hands-on workshops, seminars and online resources to accommodate diverse learning preferences and schedules; specifically designed for improving academic staff proficiency in utilizing AI for their research management.

Keywords: *Academic staff, Artificial Intelligence (AI), Challenges, Improvement, Management, Proficiency, Research, Strategies, Utilizing*

Introduction

The Nigerian universities whether public or private are important citadel of higher academic learning popularly known for their maximum contributions in manpower training and capacity development in the country. The universitiesas observed in this study are tertiary education institutions which offers undergraduate, postgraduate, part-time, sandwich programmes, professional courses and diploma courses in different fields of studies and disciplines necessary for both human capital and society developments. According to Adams (2022), the universities are higher education institutions that offer undergraduate,

graduate and postgraduate programmes in various academic disciplines. Universities also serve as centers of research, scholarship, and cultural development, contributing to knowledge creation and dissemination (Smith & Johnson, 2023).The relevance, benefits and significance of the universities in promoting sustainable development (in aspects of sociocultural, economic, political and environmental developments) for both the present and future generations within the Nigerian society cannot be overemphasized. The Federal Republic of Nigeria (FRN, 2014) under section five of the National Policy on Education (NPE) stated that the universities are very crucial higher education institutions for nation-building, social transformation, economic reconstruction and social change within the Nigerian States. The universities make optimum contributions to national development by intensifying and diversifying their programmes for development of high level manpower within the context of the needs of the nation. They also offer professional course contents that reflects our national requirements; likewise, provide accessible and affordable quality learning opportunities in formal and informal education in response to the needs and interests of all Nigerians. The universities further promote and encourage scholarship, entrepreneurship and community service in the country; and offer lifelong learning programmes that prepare undergraduate and postgraduate students with knowledge and relevant skills for self-reliance and the world of work. The universities promote both national and international understanding and interactions for a progressive society by providing quality teaching and learning likewise quality research development for students, which isorchestratedor implemented through the services of academic staff (FRN, 2014, p.39-42).

At the public universities, academic staff make significant inputs andcontributions in fosteringhigh qualitative teaching and learning delivery likewise quality research development. Academic staff of the universities are professional teaching staff of the institutionsincluding professors, who are always at the forefront of students' learning. According to Smith and Johnson (2023), academic staff are referred to as individuals andprofessionals employed by universities who are primarily engaged in teaching, research and academic leadership roles.They include professionals involved in administrative and support functions crucial to the functioning of academic programmes and institutional governance (Adams, 2022).Academic staff of the universities perform other responsibilities apart from providing quality teaching and learning, which includes administrative responsibilities and research management which is the main focus of this study. Research can be referred to as systematic investigation, experimentation and analysis aimed at discovering new knowledge, understanding phenomena, or solving problems (Brown, 2021). Research also encompasses scholarly inquiry conducted to advance academic disciplines, validate hypotheses, or contribute to intellectual discourse (Taylor & White, 2020). Management on the other hand entails the process of coordinating and overseeing activities and resources within an educational organization to achieve specific goals or objectives (Brown, 2021). Management also involves planning, organizing, leading, and controlling an educational organization's (such as the university) resources effectively, to accomplish desired outcomes (Taylor & White, 2020).Academic staff research management involves their ability towards planning, organizing, directing, and controlling activities related to research projects, ensuring their effective and efficient execution (Adams, 2022). Research management also includes strategic oversight of research activities, resource allocation, and coordination of collaborative efforts within academic institutions (Smith & Johnson, 2023). To efficiency carry out and manage research, especially in this modern era, academic staff can do that with the aid or support of such digital technology as the Artificial Intelligence (AI). Artificial Intelligence (AI) according to Russell and Norvig (2020), is the simulation of human intelligence processes by machines, especially computer systems. These processes include learning (the acquisition of information and rules for using the information), reasoning (using rules to reach approximate or definite conclusions), and self-correction. Artificial Intelligence is a branch of computer science focused on creating systems capable of performing tasks that typically require human intelligence. These tasks include problem-solving, learning from experience, understanding natural language, and recognizing patterns (Poole, Mackworth & Goebel, 2021). In recent years, the integration of Artificial Intelligence (AI) into various sectors like education has revolutionized educational processes, including research management within academic institutions. Examples of AI technologies useful for research management as indicated by some scholars like Brown (2023), Green (2023), Jones and Smith (2022), Johnson (2022), Lee (2023), Miller (2022), Roberts (2023), Taylor (2023) and White and Davis (2022) include: Natural Language Processing (NLP), machine learning algorithms, AI-powered research databases, automate statistical data analysis tool, virtual research assistant tools powered by AI, AI-enhanced collaboration platform, AI-powered plagiarism detection tools, predictive analytics for research trends, and research impact assessment tools, among others.

The aforementioned AI technologies enable academic staff to explore and facilitate new research

methodologies, conduct predictive analyses, and uncover patterns or correlations that may not be immediately apparent through traditional methods (Brown, 2022). AI tools support evidence-based decision-making in research management. Academic staff can use AI-driven insights to make informed decisions about research directions, resource allocation, and collaboration opportunities, optimizing research outcomes and strategic planning within their institutions (Taylor & White, 2023). Additionally, to effectively utilize the AI technology for research management, this demands academic staff proficiency. Proficiency in utilizing AI technology as observed by Brown (2021) and Taylor and White (2020) denotes the level of competence, skill, or expertise that individuals possess in a particular area, such as using technology or conducting research. Proficiency also refers to the capability to perform tasks effectively and efficiently, often measured by the ability to achieve desired outcomes with minimal errors. Utilizing refers to the act of making practical use of something, such as tools, resources, or knowledge, to achieve specific objectives. Utilizing also encompasses the effective application of theories or methodologies in practice, often aimed at achieving optimal outcomes (Smith & Johnson, 2023). Proficiency in utilizing use of AIhowever, empowers academic staff as researchers to innovate, discover new knowledge, and make significant contributions to their fields (Brown, 2022). The proficiency of academic staff in utilizing AI tools for research management is crucial for enhancing their productivity and innovation in academia. According to Smith and Jones (2023), AI technologies offer significant potentials in automating routine tasks, analyzing large datasets, and predicting outcomes, thereby transforming scholarly research practices. It equips academic staff with the skills to automate routine tasks, analyze vast amounts of data efficiently, and derive actionable insights. This capability accelerates the research process, allowing researchers to focus more on complex analytical tasks and creative aspects of their research. In the same vein, Adams (2022) opined that proficiency in AI allows academic staff to automate routine tasks, analyze large datasets efficiently, and derive actionable insights. This accelerates the research process, enabling researchers to focus on complex analytical tasks and creative aspects of their research. As a result, academic staff research productivity and output quality are significantly improved.Their proficiency in AI utilization for research management in public universities is a critical aspect that directly impacts research productivity, innovation, and the overall advancement of knowledge within academic institutions.AI technologies enable academic staff to explore new research methodologies, conduct predictive analyses, and uncover patterns or correlations that may not be immediately apparent through traditional methods. Proficient use of AI empowers researchers to innovate, discover new knowledge, and make significant contributions to their fields (Brown, 2022).AI tools support evidence-based decision-making in research management. Academic staff can use AI-driven insights to make informed decisions about research directions, resource allocation, and collaboration opportunities, optimizing research outcomes and strategic planning within their institutions (Taylor & White, 2023).

Despite the potential benefits of AI, academic staff face several challenges in effectively utilizing AI for research management. These challenges include: inadequate training in AI applications (Adams, 2022), limited access to AI resources and infrastructure, financial constraints and technological limitations, lack formal training and professional development opportunities focused on AI applications, and concerns about data privacy and security (Adams, 2023; Brown, 2021). Additionally, cultural resistance to adopting new technologies and the perceived complexity of AI systems contribute to the slow adoption rate among academic staff in Anambra State (Taylor & White, 2020). Including the need for interdisciplinary collaborations and cross-disciplinary partnerships across disciplinary boundaries and integrating diverse expertise into research projects (Adams, 2022).To enhance academic staff proficiency in AI utilization for research management, several strategies can be implemented. These include targeted training programmes on AI applications tailored to the specific needs of academic researchers (Adams, 2022). Collaborative initiatives between universities and industry partners can facilitate access to advanced AI tools and resources (Brown, 2021). Furthermore, establishing institutional policies that address data privacy concerns and promote a culture of innovation and experimentation with AI technologies are essential (Taylor & White, 2020). Thus, addressing the proficiency of academic staff in utilizing AI for research management in Anambra State's public universities requires a multifaceted approach. By identifying current proficiency levels, understanding existing challenges, and implementing effective improvement strategies, higher institutions like the universities can harness the full potentials of AI to advance scholarly research and innovation.Most previous studies like those ofAddah (2012), Akudo (2022), Ekpoh and Etor (2012), Ilo, Ani and Chioke (2014), Olatokun and Ntemana (2013), Okolocha and Nwadiani, (2015), Sodeeq (2016), and Tonubari, Josephine and Chioma (2012), have been conducted mainly in the areas of use of information and communication technology (ICT) in educational activities such as teaching, consultancy and research management, overlooking the aspect of AI technology

academic staff proficiency in utilizing AI technology for research management.Just a few of these empirical studies to the best knowledge of the researchers, like those of Huang (2021), Ng, Leung, Su, Ng andChu(2023), Simuț, Simuț, Bădulescu and Bădulescu (2024), Vlasova, Avksentieva, Goncharova and Aksyutin (2019), have been carried out on utilizing AI technology in education. However, the dearth of empirical studies and researches in the aspect of academic staff proficiency in utilizing AI technology for their research management have prompted this present study. Therefore, this study focused on assessing the proficiency of academic staff in utilizing AI for research management in public universities situated in Anambra State, Nigeria. Anambra State, known for its diverse academic landscape, presents a unique context for examining the adoption and challenges associated with AI in higher education. The study aimed at examining the academic staff proficiency in AI utilization, identify the challenges impeding their effective adoption of AI technologies, and proposed strategies to improve their proficiency in utilizing AI for research management within the context of public universities in Anambra State.

Statement of the Problem

The integration of Artificial Intelligence (AI) into research management practices among academic staff in public universities in Anambra State presents significant opportunities for enhancing productivity and innovation. Despite the potential benefits of AI, observations show that many academic staff are yet to efficiently and fully integrate AI into their research management. This is evident in the method in which researches are been conducted by many of academic staff of the public universities, in which, manystill heavily rely on the old conventional way of research management. Again, there exists a gap in understanding the current proficiency levels and challenges faced by academic staff to effectively utilize AI for their research management. Likewise, an existing gap in the strategies for improving academic staff proficiency in utilizing AI for their research management. The dearth of empirical studies in these areas have created a gap which needs to be filled by this present study. However, the problem in which the present study sought to address is to investigate academic staff proficiency in utilizing Artificial Intelligence (AI) for their academic research management in public universities in Anambra State, challenges and improvement strategies.

Purpose of the Study

The purpose of this study was to examineacademic staff proficiency in utilizing Artificial Intelligence (AI) for their research management in public universities in Anambra State: challenges and improvement strategies. Specifically, the study sought to:

1. Assess academic staff proficiency in utilizing Artificial Intelligence (AI) for their research management in public universities in Anambra State.
2. Identify the challenges impeding academic staff proficiency in utilizing Artificial Intelligence (AI) for their research management in public universities in Anambra State.
3. Determine possible strategies for improving academic staff proficiency in utilizing Artificial Intelligence (AI) for their research management in public universities in Anambra State.

Research Questions

The following research questions guided the study:

1. What is the current academic staff proficiency level in utilizing Artificial Intelligence (AI) for their research management in public universities in Anambra State?
2. What are thechallenges impeding academic staff proficiency in utilizing Artificial Intelligence (AI) for their research management in public universities in Anambra State?
3. What are the possible strategies for improving academic staff proficiency in utilizing Artificial Intelligence (AI) for their research management in public universities in Anambra State?

Method

A descriptive survey research design was employed in the study. The design was used to gather information from academic staff of two public universities (that is, federal-owned and state-owned universities) in Anambra State using a research instrument (that is; questionnaire) in order to retrieve dataaboutthe study. Thereafter, data retrieved were analyzed and used to conclude the study. Population for the study constituted a total of 2,588 academic staff (that is; 1,990 federal-owned university & 598-owned State university) from two public universities in Anambra State. The choice of choosing only academic staff was

because they are in better position to describe their proficiency likewise the challenges to and improvement strategies in utilizing AI technology for their research management, as regards to the present study. Sample size of the study comprised 518 academic staff (breakdown is; 398 Federal-owned university & 120 State-owned university) selected at 20% from the entire academic staff population of these two public universities using the simple random sampling technique. In drawing this sample using this technique, all the academic staff were first of all randomly selected at 20% from each of the two public universities in Anambra State. Justification for the choice of 20% for the sample is in accordance with Nworgu (2015) who stated that samples between 5% and 80% are sizeable enough for a study with large population. This was therefore considered in selecting the samples for the study. A 24-item researcher-developed questionnaire titled: "Academic Staff AI Proficiency for Research Management, Challenges and Improvement Strategies Questionnaire (ASAIPRMCIS)" and structured on a 4-point scale of Highly Proficient (HP) – 4 points, Proficient (P) – 3 points, Less Proficient (LP) – 2 points, and Not Proficient (NP) – 1 point, for answering research question one; including Strongly Agree (SA) – 4 points, Agree (A) – 3 points, Disagree (D) – 2 points and Strongly Disagree (SD) – 1 point for answering research questions two and three; and was used for data collection.Construction of the questionnaire was based on the purpose of the study and research questions. The ASAIPRMCIS was face validated by three experts from the Department of Educational Management and Policy, and one Measurement and Evaluation expert from the Department of Educational Foundations, Nnamdi Azikiwe University, Awka. Corrections were made by these experts on few items and language construction, which were incorporated before the final production and distribution of the questionnaire. Reliability of the research instrument was established through a pilot-test conducted on a sample of 25 academic staff from two public universities in Enugu State. Data collated after the pilot test were measured using Cronbach Alpha statistics which gave internal consistency reliability of 0.79, 0.81 and 0.73 for the three clusters respectively; and were summed up to give an overall coefficient r-value of 0.78, indicating that the instrument was reliableto collect the necessary data for the study. Copies of the questionnaire were distributed to the academic staff on a personal and face to face contact also employing an on-the-spot method, using the help of two research assistants who were academic staff of the two universities sampled for the study.The research assistants were communicated about the essence of the study and told what to do in order to retrieve the necessary information from their colleagues. Distribution of all copies of the questionnaire took a period of one week and thereafter, all the 518 copies of the questionnaire were gathered at a 100% rate of return and sent for appropriate data analysis.Data collated were analyzed using mean scores rated at 2.50 and standard deviation statistics.The decision rule for taking decision was that any mean score which rated above 2.50 and above was considered as proficient; while mean score which rated at 2.49 and below was considered as not proficient.

Results

Research Question 1: What is the current academic staff proficiency level in utilizing Artificial Intelligence (AI) for their research management in public universities in Anambra State?

Table 1:Mean Scores and SD Ratings of Academic Staff on their Proficiency in Utilizing AI Technology for their Research Management in Public Universities in Anambra State

N = 518 academic staff (398 Federal & 120 State)

S/N	Statements: Please give your opinion concerning your proficiency in utilizing AI technology for your research management.	Federal University Academic Staff			State University Academic Staff		
		X	SD	Decision	X	SD	Decision
	Proficiency in using:						
1.	machine learning algorithms for data-driven research management	2.28	1.11	**Not Proficient**	2.13	1.05	**Not Proficient**
2.	natural language processing technologies to analyze including interpret large volumes of text data, enabling automated literature reviews in academic research	2.07	1.08	**Not Proficient**	2.23	1.14	**Not Proficient**
3.	AI-powered databases to provide advanced search capabilities, personalized recommendations, including automated	2.13	0.91		1.94	1.00	

	indexing of research articles to enhance literature discovery and retrieval			**Not Proficient**			**Not Proficient**
4.	AI automated statistical data analysis tools in academic research	2.09	1.02	**Not Proficient**	2.15	1.13	**Not Proficient**
5.	virtual research assistants powered by AI to provide support in scheduling, organizing research activities in order to enhance productivity and efficiency for researchers	1.95	1.06	**Not Proficient**	1.95	0.91	**Not Proficient**
6.	AI-driven tools for project management, document sharing, and real-time communication	1.67	0.83	**Not Proficient**	2.23	1.02	**Not Proficient**
7.	AI-powered plagiarism detection tools to ensure originality of research work by comparing submitted manuscripts against extensive databases of published literature	2.27	0.98	**Not Proficient**	2.28	1.05	**Not Proficient**
8.	predictive analytics tools to identify emerging research trends, publication opportunities, including potential collaborators, guiding strategic planning and research direction	1.94	0.96	**Not Proficient**	1.94	0.88	**Not Proficient**
9.	AI tools to evaluate the impact of research by analyzing citations, media coverage, and social media mentions, providing comprehensive insights into research influence	1.91	0.98	**Not Proficient**	2.13	1.00	**Not Proficient**
10.	AI in analyzing the ethical implications of research by evaluating potential risks, benefits likewise ensuring adherence to ethical standards	2.29	0.98	**Not Proficient**	2.03	0.94	**Not Proficient**
	Overall Mean Score & SD =	**2.06**	**1.01**	**Not Proficient**	**2.10**	**1.02**	**Not Proficient**

Analysis of data from the above Table 1 indicated that none of the items from1 to 10 were rated above 2.50 of the acceptable mean score by the respondents (that is, academic staff of both federal and state universities) so as to agree with the statements. All the items were rated below 2.50 of the acceptable mean score by the respondents in order to show that they disagree with these statements. The overall mean scores of 2.06 (for academic staff of the federal university) and 2.10 (for academic staff of the state university) including SD of 1.01 (for federal) and 1.02 (for state) respectively, showcases closeness in the responses of the academic staff, therefore, indicating that majority of the academic staff were not proficientin utilizingArtificial Intelligence (AI) for their research management in public universities in Anambra State.

Research Question 2: What are the challenges impeding academic staff proficiency in utilizing Artificial Intelligence (AI) for their research management in public universities in Anambra State?

Table 2:Mean Scores and SD Ratings of Academic Staff on Challenges Impeding Academic Staff Proficiency in Utilizing AI Technology for their Research Management in Public Universities in Anambra State

N = 518 academic staff (398 Federal & 120 State)

S/N	**Statements: Please give your opinion concerning the challenges impeding your proficiency in utilizing AI technology for your research management.** These challenges may include:	**Federal University Academic Staff** X	SD	Decision	**State University Academic Staff** X	SD	Decision
11.	limited access to necessary AI resources, infrastructure such as hardware, software, data, Local Area Network including internet accessibility	3.02	0.92	**Agree**	3.14	0.94	**Agree**
12.	financial constraints to consistently engage in AI training/retraining programmes which affects utilizing AI tools for research management	3.02	1.00	**Agree**	2.91	0.97	**Agree**
13.	lack the technical skills required to use AI tools effectively for research management	2.77	1.03	**Agree**	3.07	0.83	**Agree**
14.	interdisciplinary knowledge gap due to lack of interdisciplinary	3.09	0.87		2.93	1.02	

	collaborations or cross-disciplinary partnerships among universities			**Agree**			**Agree**
15.	lack of institutional support in terms of funding, training, infrastructure likewise ability to integrate diverse expertise into research projects	3.10	0.96	**Agree**	3.09	1.10	**Agree**
16.	resistance to change in adopting new AI technologies among academic staff who are accustomed to traditional methods of research and teaching	2.98	1.07	**Agree**	3.18	0.97	**Agree**
17.	technological limitations hindering the use of AI technology for research management	3.02	0.95	**Agree**	2.83	1.08	**Agree**
18.	time constraints as a result of academic staff heavy workloads, especially in balancing teaching, research, and administrative duties, leaving limited time to learn and implement new AI technologies	2.82	1.07	**Agree**	3.15	0.92	**Agree**
19.	rapid evolving technology which includes fast pace of AI development making it difficult for academic staff to stay current with the latest tools and techniques, leading to a continuous learning curve	2.74	1.05	**Agree**	3.24	0.95	**Agree**
	Overall Mean Score & SD =	**2.95**	**1.00**	**Agree**	**3.06**	**0.99**	**Agree**

Analysis of data from the above Table 2 indicated that all the items from 11 to 19 were rated above 2.50 of the acceptable mean score by the respondents (that is, academic staff of both federal and state universities) so as to agree with the statements. None of the items was rated below 2.50 of the acceptable mean score by the respondents in order to show that they disagree with these statements. The overall mean scores of 2.95 (for academic staff of the federal university) and 3.06 (for academic staff of the state university) including SD of 1.00 (for federal) and 0.99 (for state) respectively, showcases closeness in the responses of the academic staff, therefore, showcasingthe challenges impeding academic staff proficiency in utilizing Artificial Intelligence (AI) for their research management in public universities in Anambra State.

Research Question 3: What are the possible strategies for improving academic staff proficiency in utilizing Artificial Intelligence (AI) for their research management in public universities in Anambra State?

Table 3:Mean Scores and SD Ratings of Academic staff on thePossible Strategies for Improving their Proficiency in Utilizing AI Technology for their Research Management in Public Universities in Anambra State

N = 518 academic staff (398 Federal & 120 State)

S/N	Statements: Please give your opinion concerning the possible strategies for improving your using AI technology for your research management. These includes:	Federal University Academic Staff			State University Academic Staff		
		X	**SD**	**Decision**	**X**	**SD**	**Decision**
20.	institutional support byorganizing continuouscomprehensive professional training for academic staff on the use of AI applications in research management	2.86	1.01	**Agree**	2.90	1.04	**Agree**
21.	fostering a culture of continuous learning, innovation, adaptation and experimentation with AI technologies in the university	3.00	1.05	**Agree**	3.21	1.00	**Agree**
22.	encouraging academic staff to engage in self-directed learning through online tutors, AI-focused forums, training sessions, workshops, and online courses on AI and data science to build foundational skills likewise stay updated with the latest developments in AI technology	2.88	1.05	**Agree**	2.99	0.94	**Agree**
23.	strengthening collaborative initiatives between universities and industry partners to facilitate access to advanced AI tools and resources	2.61	1.16	**Agree**	3.13	1.03	**Agree**
24.	establishing institutional policies that address data privacy concerns	2.82	1.09	**Agree**	2.87	1.01	**Agree**
25.	interdisciplinary collaborations or cross-disciplinary partnerships among university academic staff to leverage their expertise in AI	3.31	0.83	**Agree**	3.03	0.99	**Agree**
26.	engaging academic staff in training on the ethical use of AI to understand privacy, bias, and ethical implications	3.20	0.89	**Agree**	2.83	1.07	**Agree**

27.	advocating for institutional policies that support the integration of AI in research, curricula and teaching	2.96	1.01	**Agree**	3.04	0.82	**Agree**
28.	highlighting successful AI projects within the institution to inspire and motivate academic staff to explore AI	2.79	1.08	**Agree**	3.16	0.84	**Agree**
29.	ensuring sufficient access to AI resources including infrastructure in the university through adequate funding, facility mobilization and maintenance	2.87	1.04	**Agree**	2.85	0.92	**Agree**
	Overall Mean Score & SD =	**2.93**	**1.04**	**Agree**	**3.00**	**0.98**	**Agree**

Analysis of data from the above Table 3 indicated that all the items from 20 to 29 were rated above 2.50 of the acceptable mean score by the respondents (that is, academic staff of both federal and state universities) so as to agree with the statements. None of the items was rated below 2.50 of the acceptable mean score by the respondents in order to show that they disagree with these statements. The overall mean scores of 2.93 (for academic staff of the federal university) and 3.00 (for academic staff of the state university) including SD of 1.04 (for federal) and 0.98 (for state) respectively, showcases closeness in the responses of the academic staff, therefore, showcasingthe possible strategies for improving academic staff proficiency in utilizing Artificial Intelligence (AI) for their research management in public universities in Anambra State.

Discussion of Findings

The finding of this study revealed that the academic staff were not proficient in utilizingArtificial Intelligence (AI) for their research management in public universities in Anambra State. This finding further implied that majority of the academic staff in the public universities in Anambra Statewere not proficient in using AI tool such as the machine learning algorithms for data-driven research management. They were neither proficient in using natural language processing technologies to analyze including interpret large volumes of text data, and enabling automated literature reviews in academic research; nor proficient in using AI-powered databases to provide advanced search capabilities, personalized recommendations, and automated indexing of research articles to enhance literature discovery and retrieval. The academic staff were also not proficient in using AI automated statistical data analysis tools in academic research; and virtual research assistants powered by AI to provide support in scheduling, organizing research activities in order to enhance productivity and efficiency for researchers. They were neither proficient in using AI-driven tools for project management, document sharing, and real-time communication; nor proficient in using AI-powered plagiarism detection tools to ensure originality of research work by comparing submitted manuscripts against extensive databases of published literature. The academic staff were not proficient in using AI predictive analytics tools to identify emerging research trends, publication opportunities, including potential collaborators, guiding strategic planning and research direction. They were nor proficient in using AI tools to evaluate the impact of research by analyzing citations, media coverage, and social media mentions, providing comprehensive insights into research influence. The academic staff in the public universities in Anambra State were not proficient in using AI in analyzing the ethical implications of research by evaluating potential risks, benefits likewise ensuring adherence to ethical standards. This finding corroborates and agrees with the findings of Simuț, Simuț, Bădulescu and Bădulescu (2024) study which indicated that despite teachers limited proficiency in AI-related domains, educators also demonstrated a willingness to endorse AI adoption. However, they voiced concerns regarding the substantial effort required to acquire the necessary skills for proficiently using AI technologies and potential concerns about trust when employing AI tools. Therefore, it appeared that the teachers did not regard their digital competencies as adequate to address educational issues related to AI in this previous study. The present study finding also collaborates with the finding of Ng, Leung, Su, Ng andChu(2023) study which discovered that digital skills were not considered sufficient by teachers to use in AI-related educational issues. Findings of Huang (2021) study confirmed that to efficiently accommodate AI course content, such as programming knowledge, image processing knowledge, natural language processing knowledge, ethics of artificial intelligence and machine learning, the students need to develop several key competencies, such as skill and cultural competencies, teamwork and human-tool collaboration competencies, cognition and self-learning competencies. The present study finding also aligns and corresponds with the findings of Akudo (2022) study which revealed among others that many of the academic staff were not proficient towards utilizing majority of the emerging hardware, software, social media and google app technologies for their job performance in universities in Anambra State. This finding also collaborates withAddah (2012) study which found out high and low levels of proficiency in ICT depending upon the ICT

task to be performed, and concluded that a good curriculum designed to encourage ICT use by students as well as develop in them a multiplicity of skills, coupled with a teaching methodology that is student centred and encourages student engagement in active cognitive activities involving the use of ICTs may help stem this skewedness in proficiency.

The present study finding also concurs and flows with the finding of Tonubari, Josephine and Chioma (2012) study which established that the level of computer literacy amongst trainee teachers was more adept at skills and literacy in ICT applications. Therefore, it was worrisome that greater numbers of academic staff lacked the needed knowledge, proficiency and skills to utilize the ICT.This finding of the present study also relates with the finding of Okolocha and Nwadiani (2015) study which discovered that most tertiary institutions academic staff in Nigerian Universities lack adequate pedagogical knowledge for effective utilization of ICT facilities for teaching, research and learning. The finding further revealed that ICT application among academic staff in Nigerian universities fell below expectation.The present study finding deviates and does not flow withOlatokun and Ntemana (2013) study which found out that majority of the lecturers used various ICT resources and facilities and were also competent enough in using ICT for most of their routine work in National University of Lesotho (NUL). The present study finding also tallies and match up with the findings of Ekpoh and Etor (2012) study which indicated that the provision of ICT tools by university management was inadequate, while majority of the academic staff rated their ICT competence as low and the extent of academic staff utilization of ICT in knowledge creation activities was significantly low. However, since academic staff were not proficient in AI, it became difficult for them to efficiently use it for their research management.

It was further found out in this study that there were severalchallenges impeding academic staff proficiency in utilizing Artificial Intelligence (AI) for their research management in public universities in Anambra State. These challenges include:limited access to necessary AI resources, infrastructure such as hardware, software, data, Local Area Network including internet accessibility; financial constraints to consistently engage in AI training/retraining programmes which affected utilizing AI tools for research management; lack the technical skills required to use AI tools effectively for research management;interdisciplinary knowledge gap due to lack of interdisciplinary collaborations or cross-disciplinary partnerships among universities; lack of institutional support in terms of funding, training, infrastructure likewise ability to integrate diverse expertise into research projects; resistance to change in adopting new AI technologies among academic staff who are accustomed to traditional methods of research and teaching; technological limitations hindering the use of AI technology for research management; time constraints as a result of academic staff heavy workloads, especially in balancing teaching, research, and administrative duties, leaving limited time to learn and implement new AI technologies; and rapid evolving technology which includes fast pace of AI development making it difficult for academic staff to stay current with the latest tools and techniques, leading to a continuous learning curve. This finding agrees and is parallel with the findings of Simuț, Simuț, Bădulescu and Bădulescu (2024) whichindicated that the challenges to integrating AI into education included the need for educators' professional development regarding artificial intelligence systems and limited access to AI infrastructure, educational resources and technology. Updates to AI curriculum and educational policies to represented the third important challenge in terms of the challenges education faces with the development of AI systems. There was also a need for policy makers to direct efforts toward reducing the digital divide by ensuring equitable access to educational resources, technology, and AI infrastructure.

The present study finding is equivalent and similar to the findings of Vlasova, Avksentieva, Goncharova and Aksyutin (2019) study which revealed that teachers argued that in order to have an efficient AI educational structure, there was need to have various teacher training programmes that would provide basic AI related skills and knowledge, relevant AI content to use in school settings, connected to interactive and collaborative methods of teaching, accessible software and hardware, and user motivation initiatives.The present study finding also conforms and corresponds with the findings of Sodeeq (2016) study which revealed that challenges such as lack of infrastructure to support the computer lab, inadequate investment in educational technology system, inadequate training of teachers, unemployment of skilled ICT teachers, inadequate computers and laptops, resolving the challenges associated with learning ICT by newbies, affected teachers use of information and communication technologies in the schools investigated.The present study finding collaborates with Ilo, Ani and Chioke (2014) study which discovered that the non-availability of some ICT facilities in schools endanger educators' utilization of ICT facilities in learning and research. Also, the

present study finding corroborates and falls in line with the finding of Olatokun and Ntemana (2013) study which found out that the major challenges that constrained their use of ICT were inadequate access, inadequate ICT facilities to use and erratic communication infrastructure. Hence, with these challenges which have not been appropriately addressed and resolved, it is difficult for academic staff in the public universities in Anambra State to proficiently utilize Artificial Intelligence (AI) for their research management.

Finally, the finding of this present study revealed the possible strategies for improving academic staff proficiency in utilizing Artificial Intelligence (AI) for their research management in public universities in Anambra State. These improvement strategies include:encouraging institutional support by organizing continuous comprehensive professional training for academic staff on the use of AI applications in research management; fostering a culture of continuous learning, innovation, adaptation and experimentation with AI technologies in the university; encouraging academic staff to engage in self-directed learning through online tutors, AI-focused forums, training sessions, workshops, and online courses on AI and data science to build foundational skills likewise stay updated with the latest developments in AI technology; strengthening collaborative initiatives between universities and industry partners to facilitate access to advanced AI tools and resources; establishing institutional policies that address data privacy concerns; interdisciplinary collaborations or cross-disciplinary partnerships among university academic staff to leverage their expertise in AI; engaging academic staff in training on the ethical use of AI to understand privacy, bias, and ethical implications; advocating for institutional policies that support the integration of AI in research, curricula and teaching; highlighting successful AI projects within the institution to inspire and motivate academic staff to explore AI; and ensuring sufficient access to AI resources including infrastructure in the university through adequate funding, facility mobilization and maintenance.Enhancing academic staff proficiency in AI utilization for effective research management requires targeted strategies addressing training, resource access, ethical considerations, and interdisciplinary collaboration.

This finding corroborates and concurs with the findings of Simuț et al (2024) which revealed that the measures that can manage the consequences of the integration of AI into education included that the professional development of educators required the prioritization of comprehensive and continuous professional development programmes tailored to equip educators with AI related competencies. This would include workshops, training courses and collaborations with AI experts to ensure that educators are adapted to using AI technologies for improved learning outcomes. Initiatives to establish well-equipped artificial intelligence laboratories, provide access to educational platforms, and facilitate technological support in disadvantaged regions were essential. In terms of curriculum update, the integration of AI into curricula required proactive updates to align educational content with evolutionary advances in AI. Policymakers should collaboratively develop curriculum guidelines and educational policies that integrate AI education across disciplines, encouraging comprehensive AI literacy among students. Therefore, the creation and dissemination of AI-focused educational resources should be a central policy focus. This involves developing comprehensive AI learning modules, digital libraries, and interactive platforms to facilitate educators' access to up-to-date AI content. In addition, policymakers must prioritize the establishment of comprehensive and targeted professional development programmes for educators. These initiatives should encompass AI-specific training, workshops, and collaborative partnerships with industry experts to empower educators with the requisite skills to effectively incorporate AI into the learning process.The present study finding is similar and equally in lune with the findings of Sodeeq (2016) study which revealed that the solutions to the use of ICT in education included adequate investment in ICT infrastructure, frequent training of ICT teachers, employment of skilled teachers, training of teachers on basic introduction of ICT at early stage, collaboration with schools to learn the best practice in the use of ICT in school.The present study finding also collaborates and relates with Olatokun and Ntemana (2013) study which found out that the solutions to improving lecturers' proficiency in utilization of ICT resources included that the National University of Lesotho (NUL) authorities should improve ICT use among lecturers through training, provide more ICT equipment and services, facilitate easy access to ICT, invest in acquisition of ICT, and upgrade the bandwidth. It was further indicated that the Lesotho government should improve the electricity infrastructure and lower the tariffs on imported ICT technologies with a view to improving better exploitation of ICTs at NUL. Therefore, by implementing these tailored improvement strategies, public universities in Anambra State can enhance academic staff proficiency in utilizing AI for their research management. This can also empower academic staff to harness AI technologies effectively, drive research excellence, and contribute to knowledge advancement and societal progress.

Conclusion

Academic staff proficiency in AI utilization for their research management in public universities is a critical significant aspect that directly impacts research productivity, innovation and the overall advancement of knowledge within academic institutions. However, this study submits and concludes that the academic staff of the public universities in Anambra State generally lacked the necessary proficiency in AI applications, which is crucial for leveraging AI's potentials to enhance research management, productivity and innovation.The finding of this study also highlighted significant challenges and deficiencies in the proficiency of academic staff regarding their utilization of Artificial Intelligence (AI) for research management within public universities in Anambra State. Moreover, several challenges identified were found out to have hindered academic staff from effectively an proficiently utilizing AI for their research management and they include: limited access to AI resources and infrastructure, financial constraints which was responsible for inadequate training and professional development opportunities focused on AI technologies, concerns about data privacy and security, and resistance to adopting new AI technologies in academic settings.Given these challenges, it was imperative to implement targeted possible strategies aimed at improving the proficiency of academic staff in AI utilization for their research management. Such strategies should include comprehensive training programmes tailored to the specific needs of academic researchers, collaboration between universities and industry partners to enhance access to advanced AI tools, and the development of institutional policies that address data privacy concerns and promote a culture of innovation in the universities using AI technology.By addressing these challenges and enhancing proficiency through strategic initiatives, public universities in Anambra State can effectively harness the transformative potentials of AI to advance scholarly research management, improve educational outcomes, and contribute significantly to global knowledge production and dissemination.

Recommendations

1. The public universities in Anambra State through financial support from the government and National Universities Commission (NUC) should implement continuous comprehensive training programmes focused on AI applications through hands-on workshops, seminars and online resources to accommodate diverse learning preferences and schedules; specifically designed for improving academic staff proficiency in utilizing AI for their research management. These training programmes shouldencompass basic to advanced levels of AI knowledge and skills, addressing the specific research management needs and disciplines within Anambra State public universities.
2. The public universities in Anambra State should collaborate with governmental bodies, industry partners, and funding agencies to improve access to advanced AI tools, software, resources and infrastructure in order to address and curb all the challenges impeding academic staff proficiency in utilizing AI for their research management. This would also enable the public universities to establish such infrastructure as AI labs or centers where academic staff can experiment, innovate and collaborate on AI-driven research projects. Ensure that these resources are adequately well-equipped with the latest technologies and supported by technical experts in order to facilitate academic staff seamless proficiency, integration and application of AI in research management.
3. The public universities management with adequate support and encouragement from the government, NUC and private institutions should promote academic staff proficiency in utilizing AI for their research management by implementing the possible improvement strategies identified. This includes fostering a supportive institutional environment that encourages experimentation, innovation and interdisciplinary collaboration in AI research. Facilitating cross-institutional collaborations to share expertise, resources and best practices in AI utilization, thereby fostering a culture of continuous learning and improvement. Developing incentive structures such as grants, awards and recognition for academic staff who successfully integrate AI into their research activities, among others.

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