



## **IMPACT OF ARTIFICIAL INTELLIGENCE (AI) ON THE QUALITY OF RESEARCH BY ACADEMIC STAFF OF UNIVERSITIES IN TARABA STATE**

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### **Abstract**

The role of Artificial Intelligence (AI) in academic research has gathered significant attention in recent years. This transformative technology, powered by machine learning procedures and data analytics, is transforming the research landscape. This paper examined the impact of Artificial Intelligence on the quality of research by academic staff of universities in Taraba State, Nigeria. Three research questions and one null hypothesis guided the study. The descriptive survey research design was adopted for the study. The population of this study consisted of all the 920 academic staff of Federal University Wukari. Stratified random sampling technique was used to select 150 academic staff, stratified along male and female, as respondents who participated in the study. The instrument used for data collection was researcher-developed questionnaire titled —Impact of Artificial Intelligence on Academic Research Questionnaire (IAIARQ) on a modified four point Likert scale. The precision and internal consistency of the instrument was determined using Cronbach reliability method which gave rise to a coefficient ranging from 0.76 - 0.82. The instrument was face validated by two experts from the Faculty of Education Federal University, Wukari; with a validation index of 0.85. The data collected was analyzed using percentage scores, mean, and standard deviation. Chi-Square ( $X^2$ ) statistic was used to test the hypothesis at 0.05 level of significance. The result of the analysis revealed that majority of academic staff do not use Artificial Intelligence for their research, due to inadequate awareness, however they agree that it is a veritable tool for research. It was recommended that universities in Taraba State through the Ministry of Innovation and Digital Economy should organize workshops for academic staff to train them on how to use AI for academic research in order to improve research outcomes and reduce stress associated with data analysis

**Keywords:** Artificial Intelligence (AI), Quality of academic research, Academic Staff, Universities.

### **Introduction**

Higher Education or Tertiary Education is defined as education given after secondary education in universities, colleges of education, polytechnics, monotechnics including those institutions offering correspondence courses. Its goals include: to contribute to national development through high level relevant manpower training; develop and inculcate proper values for the survival of the individual and society; develop the intellectual capability for individuals to understand and appreciate their local and external environments; etc. (FRN, 2013). To achieve these goals, the concept of quality and standards sets in. According to Ifidon and Okoli cited in Amaechi and Obiweluzor

(2016), universities now have additional functions which include:

- *pursuit, promotion, and dissemination of knowledge;*
- *provision of intellectual leadership;*
- *manpower development;*
- *promotion of social and economic modernization;*
- *promotion of intra and inter-continental and international understanding.*

Academic staff comprises of personnel in university system, they are also known as member of the faculty. This term is loosely used to describe teachers or research staff of a university or research institute whose primary assignment in educational institution is instruction or research. Academic staff



includes staff personnel who hold an academic rank with titles such as a professor, associate professor, lecturer or the equivalent of any academic rank. To successfully execute any university educational programme requires human resources and lecturers as the academic staff are most needed resources to factually achieve the educational objectives and policies in the classroom and good end result of university education cannot be achieved without effective lecturers since they facilitate learning for the overall development.

In the words of Abbadia (2023), the role of Artificial Intelligence (AI) in academic research has garnered significant attention in recent years. This transformative technology, powered by machine learning algorithms and data analytics, is revolutionizing the research landscape. By enabling researchers to process vast amounts of data, extract meaningful insights, and automate repetitive tasks, AI has the potential to accelerate the pace of scientific discovery and enhance the quality of research outcomes. As AI continues to evolve, it is essential for researchers to adapt and embrace this powerful tool while also being mindful of its limitations and ethical implications. By striking a balance between AI-driven automation and human ingenuity, researchers can unlock new possibilities, advance scientific knowledge, and contribute to the transformative potential of AI in the realm of academic research.

AI has brought about significant changes to academia, revolutionizing the way research is conducted, knowledge is generated, and education is delivered. The integration of AI technologies in academia has the potential to streamline processes, enhance research outcomes, and foster innovation. One of the primary ways AI is changing academia is through data analysis. Researchers can leverage AI algorithms to analyze vast amounts of data quickly and efficiently. This enables them to identify patterns, correlations, and trends that may not be easily discernible through traditional methods. It can assist researchers in literature review and knowledge synthesis by automatically scanning and extracting relevant information from a wide range of scientific papers. This not only saves time but also helps researchers

stay up-to-date with the latest advancements in their field. However, the big question is how many academic staff in our universities are aware of these innovations, and use the AI resource for their academic research.

Quality is defined as the nature or standard of something as measured against other things of a similar kind, and especially the degree of excellence it possesses. The research investigates ideas and uncovers useful knowledge. Quality research most commonly denotes the scientific process including all aspects of study design in particular, it relates the judgment regarding the match between the methods and question, selection of subjects, measurement of outcomes, and protection against systematic bias, non-systematic bias and inferential error (Boaz and Ashby, 2003). Quality of research is defined by the following criteria: strong methodology, a sound theoretical background, originality, objectivity, and contribution to practice. In the university system, research quality is defined as a measure of the quality of the research undertaken in the university. Universities have two core purposes, which are teaching students and discovering new knowledge through research.

The concepts of quality and standards are closely related and often used interchangeably. In higher education, there is considerable overlap between the two concepts. However, quality and standards are not the same. Standards are specified and usually have measurable outcome indicators, which are used for comparative purposes. According to Harvey cited in Amaechi (2018), standards in higher education have been categorized into three areas: academic standard, standards of competence and service standards. Academic standards are concerned with measurement of ability to meet specified levels of academic attainment. In the words of Harvey and Green cited in Evard, Mike and Teun (2008), the concept of quality could be identified through five major approaches, which are: exceptionality, consistency, fitness for purpose, value for money and transformation. Exceptional quality is further conceptualized in three ways. These are, distinctiveness, excellence (exceeding high standards) and passing a set of (minimum)



standards. Quality as distinctiveness confers the idea of high class status to the possessor of the product.

In recent times, there is an increasing public outcry about the quality of research by university academics in Nigeria by stakeholders and the general public. They argue that academic staff conducts research for the purpose of promotion, so not an indepth research which is characterized by plagiarism, data manipulation, falsification of research results and other anomalies. With the new innovation of Artificial Intelligence in research, there is the need to investigate the impact of AI on the quality of academic research in universities in Taraba State, which is the thrust of this research.

### **Theoretical Framework**

The theory upon which the study was anchored is Charles Lindblom incremental theory of public policy.

Charles Lindblom has been identified as the chief proponent of the incremental model. This is manifested in his —Decision Making in Taxation and expenditure in his description of budgetary process (Ngu, 2006:36). He and his disciple contended that policy making involves a continuation of past policies with very little and simple modification to suit new situation or changing circumstance, and posited further, that policy does not require radical and drastic changes, but rather design to meet new challenges very slowly and progressively. This theory is relevant to this study because quality of academic research in universities are policy issues and quality is incremental in nature, hence the adoption of the incremental model. The ICT policy of universities is a deliberate action by government to empower the National Universities Commission (NUC) to ensure that universities use technology in their research and other academic activities. This purposeful cause of action can thus, be understood within the context of distributive public policy, which have experienced changes and modifications to suit new situation, and meet up present challenges such as the application of Artificial Intelligence (AI) in academic research by universities.

### **Statement of the Problem**

Universities have two core purposes, which are teaching students and discovering new knowledge through research, but in recent times, there is an increasing public outcry about the quality of research by university academics in Nigeria by stakeholders and the general public, especially researches conducted by post-graduate students of these universities. There is the argument that academic staff conducts research for the purpose of promotion, so not an indepth research which is characterized by plagiarism, data manipulation, falsification of research results and other anomalies. The above have raised concern over the reliability and ethical implications of such research outcomes which lack context and accuracy. The application of Artificial Intelligence (AI) systems in academic research can detect instances of plagiarism, promoting fairness and honesty in research and thus improve the academic integrity. The thrust of this paper therefore is to assess the impact of AI on the quality of research by university academic in Taraba State.

### **Purpose of the Study**

Specifically, the purpose of the study is:

2. To examine the extent to which academics use AI in their research in universities in Taraba State.
3. To identify how AI impacts on research by academics in universities in Taraba State.
4. To determine the proficiency of academics in using technology for academic research in universities in Taraba State.

### **Research Questions**

The following research questions guided the study.

4. How often do academic staffs use AI in their research in universities in Taraba State?
5. How has AI improved quality of academic research in universities in Taraba State?
6. How proficient are academics in the use of technology for research in universities in Taraba State?

### **Hypothesis**



The following null hypothesis guided the study and was tested at 0.05 level of significance.

H<sub>0</sub><sup>1</sup> —Artificial Intelligence (AI) has no significant impact on the quality of research by academics in universities in Taraba State.

### Methodology

The study adopted the descriptive survey research design. According to Miles and Huberman (1984) —... a survey is a method for collecting information from a sample of people by the administration of a questionnaire. The population consists of 920 academic staff of the Federal Universities Wukari, Taraba State. Simple stratified random selection procedure was used to select a sample of 150 respondents stratified along male and female. The instrument for data collection was a 15-item researcher-developed questionnaire titled —Impact of Artificial Intelligence on Academic Research Questionnaire (IAIARQ)l. It comprised two sections, A and B; Section A sought biographic

data of respondents such as, rank of respondent, sex and age; while section B comprised 15 items on the impact of AI on academic research in universities in Taraba State. The instrument rating was based on a four-point modified Likert scale of Strongly Agree (SA, 4 points), Agree (A, 3 points), Disagree (D, 2 points), Strongly Disagree (SD, 1point).

The researchers administered the questionnaire directly to respondents through five research assistants. Out of the one hundred and fifty (150) questionnaire distributed, one hundred and thirty-eight (138) copies were retrieved, which is 92% return rate, and adjudged by the researchers as significant for analysis. Mean, Standard deviation and percentages were used to answer the three (3) research questions. A Mean of 2.50 was adopted as the scale mean (agreement level) for the items. The Chi-Square statistic was used to test the Null hypothesis at 0.05 level of significance. All tests were done using the latest version of SP

### Results/Findings

*Research Question One:* How often do academic staffs use AI in their research in universities in Taraba State? *Table 1: Summary of Mean and Standard Deviation of Lecturers on how often academic staff use AI in their researches in universities in Taraba State*

S/N	ITEMS	SA	A	D	SD	M	STD	DEC.
1.	Academic staff uses AI regularly for their research in Taraba State.	23	28	31	56	2.1	1.12	Disagree
2.	Academic staff uses AI for data analysis in research in universities in Taraba State.	21	25	38	54	2.1	1.08	Disagree
3.	Academic staffs are aware of AI as an important tool	46	39	31	22	2.8	1.07	Agree
4.	Academic staff uses AI to aid Literature review in Taraba State.	27	31	40	40	2.3	1.09	Disagree
5.	AI improves quality of research and reduces stress	52	38	22	26	2.8	1.13	Agree
Cluster Mean						2.4	1.10	Disagree

Scale Mean = 2.5





Table 1 show that respondents disagree that academic staff uses AI regularly for their research work in universities in Taraba State; with a mean of 2.1 and standard deviation of 1.12. They also disagree that academic staff uses AI for data analysis in research; with a mean of 2.1 and standard deviation of 1.08.

Respondents however agree that academic staff are aware of

AI as an important tool in the research landscape; with a mean of 2.8 and standard deviation of 1.07. They further disagree that that academic staff uses AI to aid literature review in research; with a mean of 2.3 and standard deviation of 1.09. They agree that AI improves quality of research and reduces stress associated with data analysis; with a mean of 2.8 and standard deviation of 1.13. With a cluster mean of 2.4 which is below the scale mean of 2.5, it could be concluded that academic staff do not often use AI for their researches in universities in Taraba State.

*Research Question Two:* How has AI improved quality of academic research in universities in Taraba State?

*Table 2: Summary of Mean and Standard Deviation of Lecturers on how AI has improved quality of academic research in universities in Taraba State.*

S/N	ITEMS	SA	A	D	SD	M	STD	DEC.
6.	AI is responsible for the quality of questionnaire being used by researchers recently.	42	37	22	37	2.6	1.18	Agree
7.	AI is responsible for the accurate and timely data analysis by researchers in universities in Taraba State.	47	41	32	18	2.8	1.04	Agree
8.	AI is helpful to researchers in finding empirical studies related to their research.	56	43	21	18	3.0	1.04	Agree
9.	Using AI in research will make the research outcome to be more accurate and reliable.	58	46	19	15	3.1	0.99	Agree
10.	Academic researchers use AI to check for plagiarism on their researches.	21	18	58	41	2.1	1.0	Disagree
	Cluster Mean					2.7	1.05	Agree

*Scale Mean = 2.5*

Table 2 show that respondents agree that AI is responsible for the quality of questionnaire being used by researchers recently; with a mean of 2.6 and standard deviation of 1.18. They also agree that AI is responsible for the accurate and timely data analysis by researchers; with a mean of 2.8 and standard deviation of 1.04. They further agree that AI is helpful to researchers in finding empirical studies related to their research; with a mean of 3.0 and standard deviation of 1.04. They also agree that AI will make research outcome more accurate and reliable; with a mean of 3.1 and standard deviation of 0.99. They however disagree that academic staff uses AI to check for plagiarism on their researches; with a mean of 2.1 and standard deviation of 1.0. With a cluster mean of 2.7 which is higher than the scale mean of 2.5, it could be concluded that AI improves the quality of academic research in universities in Taraba State

*Research Question Three:* How proficient are academics in the use of technology for research in universities in Taraba State?

*Table 3: Summary of Mean and Standard Deviation of Lecturers on how proficient are academics in the use of technology for research in universities in Taraba State.*

S/N	ITEMS	SA	A	D	SD	M	STD	DEC.
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11.	Academic staffs have been trained by their universities on the use of AI for research.	18	13	43	64	1.9	1.03	Disagree
12.	Universities in Taraba State have functional ICT centres with free Internet services for academic staff.	22	24	41	51	2.1	1.08	Disagree
13.	Majority of academic staff still use manual methods for their research due to ICT phobia.	48	53	21	16	3.0	0.98	Agree
14.	There is need for greater awareness of the use and application of AI to academic staff in universities in Taraba State.	55	42	23	18	3.0	1.04	Agree
15.	Academic staffs are willing and ready to embrace the AI for research purposes in universities in Taraba State.	59	46	19	14	3.1	0.98	Agree
	Cluster Mean					2.6	1.02	Agree

*Scale Mean = 2.5*

Table 3 show that respondents disagree that academic staff have been trained on the use of AI for research; with a mean of 1.9 and standard deviation of 1.03. They also disagree that universities in Taraba State have functional ICT centres with free Internet services; with a mean of 2.1 and standard deviation of 1.08. They however agree that majority of academic staff still use manual methods for their research due to ICT phobia; with a mean of 3.0 and standard deviation of 0.98. They further agree that there is need for greater awareness of the use of an application of AI to academic staff of universities; with a mean of 3.0 and standard deviation of 1.04. They also agree that academic staff are willing to embrace AI for the purpose of research in universities; with a mean of 3.1 and standard deviation of 0.98. With a cluster mean of 2.6 which is higher than the scale mean of 2.5, it could be concluded that academic staff are proficient in the use of technology for research in universities in Taraba State.

### Testing of Hypothesis

H<sub>0</sub> Artificial Intelligence (AI) has no significant impact on the quality of research by academics in universities in Taraba State.

*Table 4: Chi-square ( $\chi^2$ ) test on Lecturers' opinion on the impact of AI on the quality of research by academics in universities in Taraba State.*



SCALE	Frequency	%	X <sup>2</sup> Cal. Value	X <sup>2</sup> Crit. Value	Remarks
Strongly Agree	595	28.7			
Agree	524	25.3			Reject the
Disagree	461	22.3	0.1576	12.592	Null hypo-
Strongly Disagree	490	23.7			Thesis
TOTAL	2070	100			

$$P = 0.05; df = 6$$

Decision Rule:

If  $X^2 \text{ cal.} > X^2 \text{ crit.}$

accept  $H_0$  If  $X^2 \text{ cal.} <$

$X^2 \text{ crit.}$  reject  $H_0$ .

Table 4 show that Chi Square ( $X^2$ ) calculated value is 0.1576 while the Chi Square ( $X^2$ ) critical value at degree of freedom 6 at 0.05 level of significance stood at 12.592. Going by the decision rule, the  $X^2$  calculated is less than the  $X^2$  critical, therefore the null hypothesis is rejected. This means that the alternative hypothesis is upheld, which states that Artificial Intelligence (AI) has significant impact on the quality of research by academics in universities in Taraba State.

### Discussion of Findings

The finding of this study reveals that lecturers are of the view that academic staff of universities in Taraba State, seldom use Artificial Intelligence (AI) for their research purposes. This may not be unconnected with the low-level of awareness and capacity to use AI, coupled with the challenges of privacy and bias, including ethical considerations that comes with AI. This finding is in agreement with HR (2023), who suggests that faculty should have proactive discussion with their staff about the use of AI, to create more awareness which will include an emphasis on privacy and ethical use of AI for research purposes.

The finding further reveals that Artificial Intelligence (AI) improves the quality of academic research in universities in Taraba State. This is in agreement with Abbadia (2023) who opined that as AI continues to evolve, it is essential for researchers to adapt and embrace this powerful tool while also being mindful of its limitations and ethical implications. By striking a balance between AI-driven automation and human ingenuity, researchers

can unlock new possibilities, advance scientific knowledge, and contribute to the transformative potential of AI in the realm of academic research.

The finding also reveals that academic staff in universities in Taraba State are proficient in the use of technology for research purposes; though some are still using manual method due to ICT phobia. This finding is in tandem with Babatope (2023) who posits that technology can be a powerful tool to enhance research process of academics, from finding and organizing information to analyzing and presenting results; however, not all technology is equally useful or appropriate for every research project.

The finding further reveals that Artificial Intelligence (AI) has significant impact on the quality of research by academics in universities in Taraba State.

### Conclusion

Artificial Intelligence (AI) is changing the world as we know it, and the university education system is no exception. AI has become an effective tool for addressing



challenges in higher education and accelerating progress towards SDG 4. With its ability to collect and analyze data, AI can inform researchers of new trends in the research landscape. Artificial intelligence has found numerous applications in academic research across various disciplines. In as much as we encourage all academics to embrace this tool for research purposes, care must be taken to strike a balance between AI-driven automation and human ingenuity thereby living the trend.

### Recommendations

Based on the findings, the following recommendations are made:

1. Universities in Taraba State, in collaboration with the Ministry of Innovation and Digital Economy should organize workshops to train academic staff on how to use AI for research purposes, so that they can use is regularly in their academic research.
2. Universities in Taraba State should make their ICT centres functional and provide free Internet services to allow academic staff use technology for their researches.
3. Universities in collaboration with the National Universities Commission (NUC) and government should include the use of AI as research tool in the ICT policy of universities, and make same available in all universities.

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