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THE APPLICATION OF ARTIFICIAL INTELLIGENCE (AI) AS A PANACEA FOR ACHIEVING SUSTAINABLE QUALITY ASSURANCE IN TERTIARY INSTITUTION IN NIGERIA

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Abstract

This study explored the application of artificial intelligence (AI) as a panacea for achieving sustainable quality assurance in tertiary institution in Nigeria. The specific objective includes: to examine the assessment of automated grading on feedback mechanism and to explore AI as a tool for enhancing research skills. The data utilized for the study were extracted through responses of the questionnaires distributed. The study adopted frequency and percentage tables for the analysis. The study revealed that major percentage noted that automated grading has positive and improved effect on feedback mechanism, the study also revealed that AI is an effective tool for enhancing research skills. The study concludes that the application of artificial intelligence (AI) has positive and effective influence on achieving sustainable quality assurance in tertiary institution. Thus, AI can serve as a panacea for achieving sustainable quality assurance in tertiary institution in Nigeria. This study recommended that Nigerian government should maintain the application of artificial intelligence (AI) in its educational system to ensure that Nigerian education system meets up with global standard and to maintain quality assurance in tertiary institution in Nigeria.

Keywords: Artificial Intelligence (AI), Quality Assurance, Sustainable Quality, Tertiary Institution.

Introduction

An aspect of computer science which involves development of algorithms, and programming machine language (ML) modeled after the decision-making processes of the human brain, that can learn from available vast data and make increasingly more accurate classifications or predictions over time is known as Artificial intelligence (AI) (Rouse, 2024). It replicates human capabilities through combination of advanced technologies that enable it sense, comprehend, learn and act with a level of intelligence comparable to human cognition (Widodo, Korwa, & Nuraini,2023).

They noted further that AI systems perceive environment, recognize objects, imitate patterns, and learn from past experiences which enable it to contribute to decision-making and solve complex problems, hence making its usage in many industries, including education successful for sustainable development. The application of AI in education comprises a diverse range of tools and technologies that are transforming the field of education. Personalized learning, intelligent teaching platforms, ChatGPT, chatbots, automated knowledge evaluation, virtual reality and extended reality are some examples of such applications (James, 2024; Mithu & Ajith, 2024). They explained further that AI adapts to the pace and needs of individual learners, providing personalized learning experience, while intelligent teaching platforms provide customized feedback and guidance. It automates administrative tasks such as scheduling, and resource allocation, allowing educators focus more on engaging with students (Hambali, Olasupo & Dalhatu, 2020), while also enabling students to concentrate on their academic pursuits instead of being involved in prolonged registration procedures. the use of AI in education addresses important problems like data-driven decision-making, ethical dilemmas, and the potential for future developments in the integration of virtual reality, adaptive learning systems, and universal access

to high-quality education, which will ultimately change learning paradigms (Pranav, Nausheen, &Surinder, 2024). Nevertheless, Bobula (2024) emphasized that adoption of AI in higher education has challenges such as ethical concerns like bias in AI decision-making, data privacy, and surveillance.

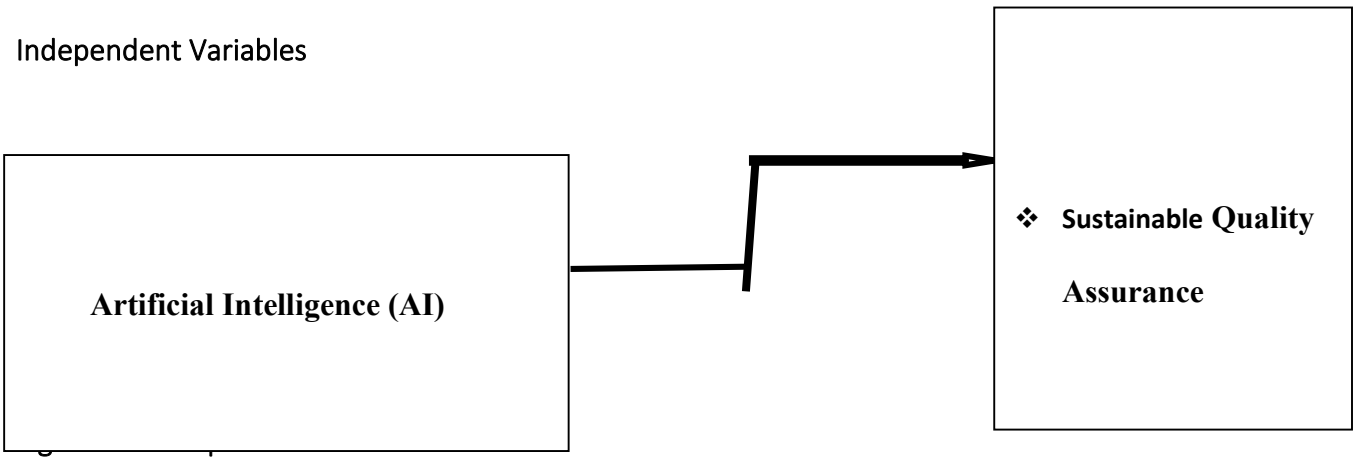
Nargis and Kumari (2024), added that there is need by institutions to acquire robust infrastructure that can support AI adoption, and train instructors, students and administrative personnel on effective use of AI-powered tools. According to Gulyamov (2024), some administrative and teaching tasks may be automated, potentially displacing jobs, therefore, over-reliance on AI may diminish human interaction and critical thinking skills. He emphasized the need for continuous evaluation of AI systems and collaboration among experts and stakeholders for optimizing AI in decision-making.

Area of Study

This study focused on the application of artificial intelligence (AI) as a panacea for achieving sustainable quality assurance in tertiary institution in Nigeria.

Literature Review

Conceptual Framework



Theoretical Literature/Review

Diffusion of Innovation Theory

Rogers (1995) proposed the Diffusion of Innovations (DOI) hypothesis to describe how innovation might be spread from one user to another in a variety of ways over a period of time. (Sarker & Sahay, 2004). The DOI hypothesis investigates how creative ideas are passed down from generation to generation. According to the DOI hypothesis, an invention is continuously transmitted through numerous channels among people who have the same social values. (Echchab & Hassanuddeen,2013). The dispersal of innovation hypothesis examines the rate at

which new developments spread, how they spread, and why they spread, with the goal of determining the factors that influence the selection of new data innovation advancements.
The diffusion of innovations uses a normal distribution curve that may be partitioned into five parts to characterize people in terms of innovativeness. According to diffusion theory, the most important factor in developing innovation implementation is: absolute advantage, companionable, simplicity, trial ability as well as ease to be detected (Monyoncho, 2015). DOI also classifies users as modernizer, early modernizers, and timely mass, late mass and stragglers (Echchab & Hassanuddeen, 2013). According to the DOI hypothesis, innovations are passed on in a variety of methods over time as well as through a specific system (Sarker & Sahay, 2004).

Systems Theory (Ludwig Von Bertalanffy)

The theory was propounded by Ludwig von Bertalanffy, an Austrian-Canadian biologist and philosopher, in the 1940s. The theory views organizations as complex, dynamic systems comprising interdependent elements that must be strategically aligned and coordinated to achieve optimal performance, efficiency, and success (Chikere & Nwoka, 2015). Similarly, an institution functions as a system made up of interconnected subsystems, such as academic departments, administration, and finance, all working together to achieve the shared objective of academic excellence. Systems Theory emphasizes that the institutions should be viewed as integrated systems, rather than separate functions or departments for effective coordination and collaboration among these subsystems.

Empirical Review

This section of the study examines various extant studies on this research topic.
In their study, Mohammed (2025) examined AI-driven decision support systems for sustainable administration of public universities in Rivers State, focusing on the potentials and challenges associated with its utilization. By leveraging on artificial intelligence, the decision support system analyzes the vast data and enables institutions to make informed decisions regarding document management, student outcome prediction, resource allocation, and strategic planning, ultimately contributing to a more sustainable future for these universities. This potential enables the AI system to address current challenges and consequently paves way for advancement. The paper concludes that AI technologies have become very imperative for the effective and sustainable administration of public universities in Rivers State, Nigeria. The paper recommends inter alia that the administration of higher institutions in Rivers State should implement the application of AI technologies for enhanced operational and administrative effectiveness.

Neelakrishnan (2024) provided decision support system for redefining enterprise data management with AI-powered automation to show how AI technologies can enhance data accuracy, processing efficiency and decision-making capabilities. The results indicated that the implementation of AI-driven automation leads to significant improvement in processing speed and data accuracy. Aderuyi and Amaewhule (2024), examined the adoption of AI to sustain lecturers' academic integrity, they concluded that while lack of competence and career progression can drive lecturers to academic fraud, AI provide them with personalized learning. Widodo, Korwa, and Nuraini, (2023) developed a system to identify and implement strategies for the implementation of artificial intelligence in lecturer performance evaluation systems in higher

education. They focused on how to improve the efficiency of lecturers' evaluation process, objectivity, accuracy, and providing meaningful feedback to the lecturers. The result revealed that implementing artificial intelligence in the lecturers' performance evaluation system succeeded in improving the accuracy of the evaluation.

Afonughe, Onah, Uzoma, Andor, and Orisakwe (2021), investigated the integration of AI-chatbot into teaching and learning in South-South, Nigeria. They found out that universities in South-South are yet to integrate the AI-chatbot into administration task and education, and that traditional approach of teaching and handling administrative tasks are still in use. By implementing AI-driven systems institutions can create a more efficient, effective, and student-centric environment, ultimately driving success and excellence. Sarjiyus, Goni, and Jamilu (2019) developed an intelligent decision-support system for university admission and placement of potential students in Nigerian universities. Their findings showed that the system chose the most qualified applicants, while placing other eligible applicants who did not meet the requirements for a particular program into alternative courses that are available and for which they qualified.

Summary of Empirical Review

S/N	Author(s)	Year	Topics	Methodology	Findings
1	Mohammed	(2025)	Examined AI-driven decision support systems for sustainable administration of public universities in Rivers State, focusing on the potentials and challenges associated with its utilization.	The decision support system analyzes the vast data and enables institutions to make informed decisions regarding document management, student outcome prediction, resource allocation, and strategic planning, ultimately contributing to a more sustainable future for these universities.	This potential enables the AI system to address current challenges and consequently paves way for advancement. The paper concludes that AI technologies have become very imperative for the effective and sustainable administration of public universities in Rivers State, Nigeria. The paper recommends inter alia that the administration of higher institutions in Rivers State should implement the application of AI technologies for enhanced operational and administrative effectiveness.
2	Aderuyi and Amaewhule	(2024)	Examined the adoption of AI to sustain lecturers' academic integrity	The study adopted descriptive statistics and frequency tables for the analysis.	They concluded that while lack of competence and career progression can drive lecturers to academic

					fraud, AI provide them with personalized learning.
3	Neelakrishnan	(2024)	Decision support system for redefining enterprise data management with AI-powered automation.	The study adopted descriptive statistics.	The results indicated that the implementation of AI-driven automation leads to significant improvement in processing speed and data accuracy.
4	Widodo, Korwa, and Nuraini	(2023)	Identify and implement strategies for the implementation of artificial intelligence in lecturer performance evaluation systems in higher education.	They focused on how to improve the efficiency of lecturers' evaluation process, objectivity, accuracy, and providing meaningful feedback to the lecturers.	The result revealed that implementing artificial intelligence in the lecturers' performance evaluation system succeeded in improving the accuracy of the evaluation.
5	Sarjiyus, Goni, and Jamilu	(2019)	Developed an intelligent decision-support system for university admission and placement of potential students in Nigerian universities.	The study adopted descriptive statistics.	Their findings showed that the system chose the most qualified applicants, while placing other eligible applicants who did not meet the requirements for a particular program into alternative courses that are available and for which they qualified.

Methodology

Sources of Data

The data necessary for the successful completion of this article was collected through primary and secondary sources.

Primary Source of Data

Primary data refer to first hand or raw data, original records and materials created by participants or witnesses of the event under study. The primary data for this research includes; questionnaires.

Secondary Source of Data

The secondary data are important information relating to this work, that has been gathered and often interpreted by other researchers and they are gotten from textbooks, articles, journals, magazines, conference papers, seminars and other publications.

Area of Study

This study focused on the application of artificial intelligence (AI) as a panacea for achieving sustainable quality assurance in tertiary institution in Nigeria.

Population of the Study

The target population of this study is 30 respondents.

Sample Size of the Study

According to Mugenda and Mugenda (2003) a sample is a group of persons or items selected from the population that will be subjected to the study and is usually a representative of the entire population. The sample size was determined using

Yamane formula was used to determine the sample size. The formula is given as:

$$n = \frac{N}{1+N(e)^2}$$

Where N=total sample
n= sample
1 =constant
E= coefficient confidence (error margin 0.05)

Determination of n (sample size)

$$n = \frac{N}{1+N(e)^2}$$

Where N =35
e = 5%

$$n = \frac{35}{1+35(0.05)^2}$$

$$n = \frac{35}{1+35(0.0025)}$$

$$n = \frac{35}{1+0.1}$$

$$n = \frac{35}{1.1}$$

Sample size (n) = 32.94
Approximately = 33

Description of Research Instrument

A structured questionnaire, on a five-point Likert rating scale and other itemized questions was used to collect data for the study. The research instrument for the study was questionnaires. The

questionnaires were formulated in two major sections. Section A covered demographic information of the respondents while section B was the variables of the study.

Data Analyses Techniques

The data collected will be tested and analyzed by frequency and percentage tables with the aid of the statistical packages for social sciences (SPSS version 21.0).

Data Presentation, Analysis and Interpretation

In this section, for the purpose of this study and analysis, only relevant questions that will help us test the hypothesis would be analyzed. From the questionnaires the study adopted sampling percentage analysis method and simple linear regression for the analysis.

The total of 33 questionnaires were issued by the researcher out of which 29 were attended to and returned, which will be used to analyze and compute the data.

4.1 Socio-Demographic Characteristics of the Respondents

Table 4.1: Socio demographic characteristics of variables of the application of artificial intelligence (AI) as a panacea for achieving sustainable quality assurance in tertiary institution in Nigeria.

Items	Frequency	Percentage
Gender		
Male	24	82.8
Female	5	17.2
Total	**29**	**100**
Age(years)		
20-35	9	31.0
36-50	14	48.3
Above 60	6	20.7
Total	**29**	**100**
Marital status		
Single	4	13.8
Married	25	86.2
Total	**29**	**100**
Level of education		
Graduate	10	34.5
Postgraduate (Masters/PhD	19	65.5
Total	**29**	**100**
Years of work		
Less than 10years	11	37.9
10-20years	14	48.3
20-30years	02	6.9
Above 30years	02	6.9
Total	**29**	**100**

Source: Researcher's survey, 2025

Table 4.1 above displayed the demographic variables of participants. Findings show that majority of the respondents are male which represents about 24(82.8%) while the remaining 17.2% are female. The findings also show that majority of the respondents 14(48.3%) were within the age range of 36-50 years of age. Marital status shows that 25(86.2%) of respondents are married while 4(13.8%) of the respondents are single. Based on the level of education 19(65.5%) are within postgraduate level. Majority of the respondents 14(48.3%) have worked for 10-20 years.

Table 4.2: Assessing the automated grading and feedback mechanism.

Statements	SA (%)	A (%)	SD (%)	D (%)	SD (%)	Mean	Std. Dev.
AI-based grading system streamline assessment processes.	8 (27.6%)	16 (55.2%)	03 (10.3%)	01 (3.4%)	01 (3.4%)	11.4138	5.53894
AI offers instant feedback on assignments and exams.	19 (65.5%)	09 (31.0%)	01 (3.4%)	-	-	15.2759	5.41754
The adoption of AI for automatic grading helps to minimize inaccuracy of records.	12 (41.4%)	13 (44.8%)	02 (6.9%)	02 (6.9%)	-	11.0690	3.72186

Source: Researcher's survey, 2025

Results of table 4.2 depicts the automated grading and feedback mechanism. 16 (55.2%) respondents agreed that AI-based grading system streamline assessment processes while 8 (27.6%) respondents strongly agreed that AI-based grading system streamline assessment processes. 19 respondents which made up 65.5% agreed that AI offers instant feedback on assignments and exams. 13(44.8%) of respondents agreed that the adoption of AI for automatic grading helps to minimize inaccuracy of records while 13(41.4%) of respondents agreed that the adoption of AI for automatic grading helps to minimize inaccuracy of records.

Table 4.2: AI as a tool for enhancing research skills.

Statements	SA (%)	A (%)	SD (%)	D (%)	SD (%)	Mean	Std. Dev.
AI assists students in conducting research by analyzing large datasets.	19 (65.5%)	07 (24.1%)	01 (3.4%)	02 (6.9%)	-	14.3103	6.74062
AI helps in identifying trend and suggesting relevant literature.	14 (48.3%)	13 (44.8%)	02 (6.9%)	-	-	12.7241	3.01065
AI tools helps to maintain quality research.	10 (34.5%)	15 (51.7%)	01 (3.4%)	03 (10.3%)	-	11.5517	4.36370

Source: Researcher's survey, 2025

Results of table 4.2 depicts the AI as a tool for enhancing research skills. 19 (65.5%) respondents strongly agreed that AI assists students in conducting research by analyzing large datasets. 14 respondents which made up 48.3% agreed that AI helps in identifying trend and suggesting relevant literature while 13 (44.8%) respondents agreed that AI helps in identifying trend and suggesting relevant literature. 15(51.7%) of respondents agreed that AI tools helps to maintain quality research while 10(34.5%) of respondents strongly agreed that AI as a tool for enhancing research skills.

Discussion of Findings

This study examined the application of artificial intelligence (AI) as a panacea for achieving sustainable quality assurance in tertiary institution in Nigeria. Findings from the analysis was categorized into Socio demographic characteristics of variables, and the two specific objectives. The socio demographic characteristics findings revealed that majority of the respondents are male which represents about 24(82.8%) while the remaining 17.2% are female. The findings also show that majority of the respondents 14(48.3%) were within the age range of 36-50 years of age. Marital status shows that 25(86.2%) of respondents are married while 4(13.8%) of the respondents are single. Based on the level of education 19(65.5%) are within postgraduate level. Majority of the respondents 14(48.3%) have worked for 10-20 years.

The first objective is on the assessment of automated grading on feedback mechanism. The findings showed that 16 (55.2%) respondents agreed that AI-based grading system streamline assessment processes while 8 (27.6%) respondents strongly agreed that AI-based grading system streamline assessment processes. 19 respondents which made up 65.5% agreed that AI offers instant feedback on assignments and exams. 13(44.8%) of respondents agreed that the adoption of AI for automatic grading helps to minimize inaccuracy of records while 13(41.4%) of respondents agreed that the adoption of AI for automatic grading helps to minimize inaccuracy of records. From the findings automated grading has positive and improved feedback mechanism. The findings of this study is in line with Neelakrishnan (2024).

The second objective explored AI as a tool for enhancing research skills. The findings showed that 19 (65.5%) respondents strongly agreed that AI assists students in conducting research by analyzing large datasets. 14 respondents which made up 48.3% agreed that AI helps in identifying trend and suggesting relevant literature while 13 (44.8%) respondents agreed that AI helps in identifying trend and suggesting relevant literature. 15(51.7%) of respondents agreed that AI tools helps to maintain quality research while 10(34.5%) of respondents strongly agreed that AI as a tool for enhancing research skills. From the frequency tables AI is an effective tool for enhancing research skills. The findings of this study is in line with Neelakrishnan (2024).

Conclusion

The study evaluated the application of artificial intelligence (AI) as a panacea for achieving sustainable quality assurance in tertiary institution in Nigeria. The specific objective includes: to examine the assessment of automated grading on feedback mechanism and to explore AI as a tool for enhancing research skills. The study adopted frequency and percentage tables for the analysis. The study revealed that major percentage noted that automated grading has positive and

improved effect on feedback mechanism, the study also revealed that AI is an effective tool for enhancing research skills. The study concludes that the application of artificial intelligence (AI) has positive and effective influence on achieving sustainable quality assurance in tertiary institution. Thus, AI can serve as a panacea for achieving sustainable quality assurance in tertiary institution in Nigeria. This study recommended that Nigerian government should maintain the application of artificial intelligence (AI) in its educational system to ensure that Nigerian education system meets up with global standard and to maintain quality assurance in tertiary institution in Nigeria.

References

Afonughe, E., Onah, E. N., Uzoma, A. C., Andor, S. E., &Orisakwe, C. U. (2021). Integration of artificial intelligence tool (Ai-chatbot) into teaching and learning: A panacea for universities education and administrative duties in south-south, Nigeria. Journal of Computer Science & Systems Biology, 14(6), 1-6.

Chikere, C., & Nwoka, J. (2015). The systems theoryof management in modern day organizations – A study of Aldgate congress resort limited Port Harcourt. International Journal of Scientific and Research Publications, 5(9), 1-7.

Hambali, M. A., Olasupo, Y., &Dalhatu, M. (2020). Automated university lecture timetable using heuristic approach. Nigerian Journal of Technology, 39(1), 1-14.

James, Y. (2024). The rise of artificial intelligence in education. International Journal of Innovative Research and Development, 13(2), 74-83.

Mohammed, S.N. (2025). Artificial Intelligence (AI)-Driven Decision Support Systems for Sustainable Administration of Public Universities in Rivers State, Nigeria. International Journal of Educational Management, Rivers State University. 1, (2).

Mugenda, M., & Mugenda, (2003). *Research Methods Qualitative Approaches*. Nairobi: Africa Centre for Technology Studies.

Neelakrishnan, P. (2024). Redefining enterprise data management with AI-Powered automation. International Journal of Innovative Science and Research Technology, 9(7), 660-668.

Rouse, M. (2024). Artificial Intelligence (AI). Retrieved from https://techopedia.com/definition/190/articucial-intelligence-ai

Sarjiyus, O., Goni, I., &Jamilu, A. E. (2019). Intelligent decision-support system for University admission and placement. Asian Journal of Applied Science and Technology, 3(20), 116- 121.

Widodo, B. Y., Korwa, U. R., & Nuraini, R. (2023). Artificial intelligence based decision support system for education management in higher education. Al-Fikrah: JurnalManajemenPendidikan, 11(2), 352-365.