



CHALLENGES AND STRATEGIC MEASURES FOR APPLICATION OF ARTIFICIAL INTELLIGENCE IN BUSINESS EDUCATION RESEARCH IN NIGERIAN TERTIARY INSTITUTIONS

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Abstract

The study examined the challenges and strategic measures for application of Artificial Intelligence (AI) in Business Education research in Nigerian tertiary institutions. The study was carried out in South-south Nigeria using two out of the six states in the region namely Bayelsa and Delta states. Through multistage random sampling technique, 143 Business Education lecturers and 32 Business Education Instructors making a total of 175 respondents were sampled for the study. The instrument for data collection was a structured 30-items questionnaire. The instrument was subjected to content and face-validation. Three experts in the department Business Education, University Of Delta, Agbor validated the instrument. The reliability of the instrument was ascertained using Cronbach Alpha reliability method which yielded a reliability coefficient of 0.846. Data for the study were collected by the researcher with the help of six research assistants. Out of the 175 copies of the questionnaire administered to the respondents, 168 copies were retrieved representing 96% rate of return. The Data collected was analyzed, using mean and standard deviation to answer the research questions while t-test statistics was used in test the hypothesis at 0.05 level of significance. From the data collected and analyzed, the results identified 15 possible challenges in the application of Artificial Intelligence in Business Education research and 12 strategic measures for application of Artificial Intelligence in Business Education research. The result of the hypotheses tested revealed significant ($p < 0.05$) difference in the mean ratings of Business Education Lecturers and Instructors on challenges in the application of Artificial Intelligence in Business Education research whereas on the strategic measures for application of Artificial Intelligence in Business Education research, there is no significant ($p < 0.05$) difference in the mean ratings of the responses of Business Education Lecturers and Instructors. Based on the findings, the study among others recommended that formulation of necessary Artificial Intelligence related policy for driving application of Artificial Intelligence in Nigerian education and research conducts.

Keywords: Challenges, strategic measures, artificial intelligence, business education, research, tertiary institutions.

Introduction

The Nigerian education system is structured into elementary/primary, secondary and tertiary institution. The tertiary institution as described by Federal Republic of Nigeria (2014) includes universities, colleges of education, polytechnics / monotronics. It is the third tier of education that provides training in an ever-increasing number of specialization necessary for the modern society. In the opinion of Okeke and Osuala (2016), tertiary institutions are advanced level of education and training of people for the work force and other societal engagements. Amusa and Hamzat (2024) submitted that a functional tertiary institution system forms an integral part of the process of sustainable human capital development as it endows people with the required knowledge, attitudes and skills for improved employability, support for effective capacity to



contribute to research and innovation and overall development of the country. Akinyemi, Ayorinde and Tolatu (2017) pointed out that the core mandate of tertiary institutions is to assist in the development of the nation's development goals. This is because, tertiary institution is far more than a tool to acquire credentials but saddles with the responsibility of advancing cutting-edge research and innovations to improve human society and existence. In affirmation, Chankseliani and McCowan (2021) stated that higher education such as universities have major role in the sustainable development goals as a driver for the achievement of the full set of goals, through knowledge production, research and innovation.

Research is at the centre of human development as no human society can witness meaningful development without innovation and intensive research effort. Research is an academic process of identifying a problem, developing set of objectives that must be achieved, systematically making an inquiry into the identified problem through collection of data, careful analysis of data, interpretation of results, making deductions and drawing conclusion to add to the body of knowledge in accordance with methodologies of the professional field or discipline (Amusa and Hamzat, 2024). According to Muresan and Gogu (2012), tertiary institutions such as universities represent major promoters of research and innovation for the development of new solutions in the technological and socioeconomic areas of human societies. The Institute for Academic Development (2020) equally noted that research targets mostly the provision of solutions to wide research questions. It is imperative to state that the contemporary research is gradually being taking over by the use of Artificial Intelligence because of its efficiency.

Artificial Intelligence refers to the ability of a computer-controlled robot to perform tasks like humans having ability to reason for quality job performance. Nwanguma and Onyeukwu (2023) described Artificial intelligent as ability of a digital computer or computer-controlled robots to perform tasks commonly associated with intelligence of human beings. UNESCO (2019) reported that Artificial Intelligence has the potential to address some of the biggest challenges in education to stimulate innovate teaching and learning practices, research and accelerated progress towards attaining rapid national development. The use of Artificial Intelligence in education and research according to Chen, Xie and Hwang (2020) include the use of intelligent tutoring systems, teaching robots, learning analytics dash boards, adaptive learning systems, human-computer interactions, data collection, data cleaning, analysis and reporting among others. Ouyang and Jiao (2021) affirmed that the implications of Artificial Intelligence hold significant potential for the research process as in most qualitative researches, data analysts organized data by applying short, descriptive codes to segments of text, making it easier to summarize large sets of data through the use of Artificial Intelligence. Fabricio (2023) observed that unleashing the significance of Artificial Intelligence in academia and research is like opening a treasure chest of limitless possibilities to researchers to dive into the future research activities where Artificial Intelligence is not just a tool but a revolutionary companion.

The rapidly evolving landscape of Artificial Intelligence and its potential to advance knowledge, research, and scholarly works is enormous as the engagement of artificial intelligence in research has the capacity to save researchers time and resources, enable them to tackle more complex research problems, and enhance the quality of their research work (Information Technology Services, 2024). In addition, Abbadia (2023) submitted that the role of Artificial Intelligence in academic research has garnered significant attention in recent years as the transformative technology powered by machine learning algorithms and data analytics, is revolutionizing the research landscape. Therefore, as the engagement of Artificial Intelligence continues to evolve, it is essential for researchers across all academic fields of endeavour including



Business Education to adapt and embrace this powerful tool while also being mindful of its limitations and ethical implications.

The significance of Business Education research for instance to skill acquisition, employability of teaming youths and national development cannot be overemphasized. For instance, Ekwue, et al, (2022) noted that Business Education as an educational programme that equips individual recipients with functional and suitable skills, knowledge, attitudes and values that enables them to operate in the work environment for self-reliance and in turn national development. Ore, et al. (2022) justified that Business Education equips learners with the required knowledge, vocational skills and aptitude to effectively manage personal businesses and at the same time function effectively in the economic system. Hence, it was based on this background that this study was carried out to examine the challenges and strategic measures for application of artificial intelligence in Business Education research in Nigerian tertiary institutions.

Research Questions

The following research questions were raised for the study:

- i. What are the challenges in the application of Artificial Intelligence in Business Education research in Nigerian tertiary institutions?
- ii. What are the strategic measures for application of Artificial Intelligence in Business Education research in Nigerian tertiary institutions?

Hypotheses

The following two null hypotheses were tested at 0.05 level of significance.

H0₁: There are no significant challenges in the application of Artificial Intelligence in Business Education research in Nigerian tertiary institutions.

H0₂: There are no significant difference on strategic measures for application of Artificial Intelligence in Business Education research in Nigerian tertiary institutions.

Methodology

The study was carried out in South-south Nigeria comprising six states of Akwa Ibom, Bayelsa, Cross River, Delta, Edo and Rivers. Two research questions and two null hypotheses were developed for the study. The study adopted the use of descriptive survey research design. A multistage sample was used to randomly select a sample of 175 respondents.

The instrument for data collection was a researcher structured questionnaire titled: This instrument was subjected to content and face-validation by three experts. Two of the experts are from the department of Business Education and one Measurement/Evaluation Lecturer all from Nnamdi Azikwe University, Awka, Anambra State. Data collected were analysed using mean and standard deviation to answer the research question while t-test statistical tool was used to test the hypothesis.

Results

Research Question One

What are the challenges in the application of Artificial Intelligence in Business Education research in Nigerian tertiary institutions?

The data for answering research question one are presented in Table 1.

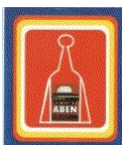


Table 1: Challenges in the application of Artificial Intelligence (AI) in Business Education research in Nigerian tertiary institutions (n = 168)

SN	Challenges in Application of AI in Business Education research are:	\bar{X}	SD	Rmks
1	Lack of comprehensive public policy on application of AI in education and research	3.68	0.48	Agree
2	Poor knowledge of adaptive learning algorithms required for the use of AI for research conduct	3.82	0.52	Agree
3	Inadequate funding of research and resources required for application of AI in research	3.62	0.49	Agree
4	Lack of required infrastructure for effective use of AI for researches in Nigerian tertiary institutions	3.78	0.50	Agree
5	Lack of willingness of education administrators to embrace AI in education and research	2.32	0.84	Disagree
6	Unstable power supply is a big challenge in the application of AI in research conduct	3.80	0.47	Agree
7	Widening inequalities as the disadvantaged population are more likely to be excluded from AI-powered education and research	3.66	0.51	Agree
8	The fear of human job losses will constitute a big challenge in application of AI in Nigerian research	3.60	0.55	Agree
9	Wide skill gaps and digital illiteracy in effective application of AI in Nigerian education and researches	3.83	0.48	Agree
10	Non-willingness to adopt the use of AI by some researchers due to techno-phobia	3.54	0.52	Agree
11	Possible high cost of training of researchers in effective use of AI in research conduct	3.65	0.47	Agree
12	High cost of reliable and timely data for fueling AI-powered education and research in Nigerian tertiary institutions	3.74	0.51	Agree
13	Weak educational framework that improves the teaching and learning of AI in Nigerian tertiary institutions	3.66	0.55	Agree
14	Lack of readiness of foreign researchers to collaborate with Nigerian researchers in the use of AI for research	2.27	0.80	Disagree
15	Very weak internet services and connection constitute a challenge in the use of AI for research	3.69	0.46	Agree
16	Poor level of awareness of AI-powered research among educationists and researchers	3.40	0.45	Agree
17	Lack of AI local contents constitute a great challenge in its adoption in Nigerian education and research	3.75	0.69	Agree
Grande Mean / SD		3.52	0.49	Agree

Note: \bar{X} = Mean; SD = Standard Deviation; N = number of respondents.

The result in Table 1 showed that the mean (\bar{x}) values of 15 out of the 17 items ranged from 3.40 to 3.83 which are all greater than the criterion reference point value of 2.50. This indicates that the respondents agreed that the 15 identified items in the Table are possible challenges in the application of Artificial Intelligence in Business Education research in Nigerian tertiary institutions.



The mean values on the remaining two items, specifically items 5 and 14 are 2.32 and 2.27 respectively which are both less than the criterion reference point of 2.50. This implied that the two items (5 and 14) in the table are not part of the challenges in the application of Artificial Intelligence in Business Education research in Nigerian tertiary institutions. The standard deviation values of the 17 items ranged from 0.45 to 0.84 which suggests that the responses of the respondents are close to the mean and one another.

Research Question Two

What are the strategic measures for application of Artificial Intelligence in Business Education research in Nigerian tertiary institutions?

The data for answering research question two are presented in Table 2.

Table 2: Strategic measures for application of Artificial Intelligence in Business Education research in Nigerian tertiary institutions (n = 168)

S N	Strategies for application of AI in Business Education research are:	\bar{X}	SD	Rmks
1	Improved funding education and research with the required AI resources	3.80	0.54	Agree
2	Provision or reduction of data cost for fueling AI-powered education and research	3.46	0.51	Agree
3	Provision of strong and stable internet services to stimulate the use of AI for research	3.67	0.52	Agree
4	Integration of AI into Nigerian school curriculum for increased teaching and learning of AI in schools	3.58	0.72	Agree
5	Place more priority over AI-related researches over other forms of researches that are not AI-related	2.48	0.86	Disagree
6	Incorporation of local contents into AI configuration for Nigerian education and research	3.69	0.50	Agree
7	Adequate provision of necessary infrastructure and AI-driven facilities to enhance AI education and researches	3.76	0.48	Agree
8	Provision of stable electricity in Nigerian schools for effective use of AI in research	3.66	0.52	Agree
9	Formulation of AI-driven policies by government for enhancing adoption of AI in education and research	3.56	0.52	Agree
10	Increased awareness creation on the need for adoption of AI-powered instruction and research	3.74	0.53	Agree
11	Sustained training and retraining of educators and researchers on effective use of AI	3.68	0.45	Agree
12	Special intervention fund or subsidy for Artificial Intelligence-powered researches	3.71	0.52	Agree
13	Establishment of Departments of Artificial Intelligence (AI) in Nigerian tertiary institutions to stimulate AI-related researches.	3.48	0.57	Agree
Grande Mean / SD		3.56	0.61	Agree

Note: \bar{X} = Mean; SD = Standard Deviation; N = number of respondents.

The result in Table 2 revealed that the mean (\bar{x}) values of 12 out of the 13 items ranged from 3.46 to 3.80 which are all greater than the criterion reference point value of 2.50. This suggests



that the respondents agreed that the 12 identified items in the Table are strategic measures for application of Artificial Intelligence in Business Education research in Nigerian tertiary institutions. The mean value on the remaining one item, specifically item 5 was 2.48 which is less than the criterion reference point of 2.50. This signified that item 5 (placing more priority over AI-related researches over other forms of researches that are not AI-related) in the table is disagreed with by the respondents as part of the strategic measures for application of Artificial Intelligence in Business Education research in Nigerian tertiary institutions. The standard deviation values of the 13 items ranged from 0.45 to 0.86 which indicates that the responses of the respondents are close to the mean and one another.

Testing of Hypotheses

Hypotheses One

H0₁: There are no significant challenges in the application of Artificial Intelligence in Business Education research in Nigerian tertiary institutions.

The data for testing hypothesis one are presented in Table 3 below.

Table 3: Test of no significant difference in the mean ratings of Business education lecturers and Instructors on possible challenges in the application of Artificial Intelligence in Business Education research in Nigerian tertiary institutions.

Variables	N	\bar{X}	SD	DF	t- Cal	p-value	Level of Sig.	Rmks
Bus. Education Lecturers	137	3.63	0.45					
Bus. Education Instructors	31	3.40	0.62	166	2.18	0.01	0.05	S*

Note: S* = Significant at 0.05.

The result presented on the t-test statistics in Table 3 above revealed that the p-value of 0.01 is less than 0.05 level of significance at 166 degree of freedom. This indicated that there is significant ($p < 0.05$) difference in the mean ratings of the responses of Business Education Lecturers and Instructors on possible challenges in the application of Artificial Intelligence in Business Education research in Nigerian tertiary institutions. Hence, the null hypothesis of no significant ($p < 0.05$) difference in the mean ratings of the responses of the Business education lecturers and Instructors is rejected for hypothesis one.

Hypotheses Two

H0₂: There are no significant strategic measures that can enhance the application of Artificial Intelligence in Business Education research in Nigerian tertiary institutions.

The data for testing hypothesis two are presented in Table 4 below.



Table 4: Test of no significant difference in the mean ratings of Business education lecturers and Instructors on strategic measures for application of Artificial Intelligence in Business Education research in Nigerian tertiary institutions

Variables	N	\bar{X}	SD	DF	t- Cal	p- value	Level of Sig.	Rmks
Bus. Education Lecturers	137	3.58	0.53					
Bus. Education Instructors	31	3.54	0.56	166	0.78	0.65	0.05	NS

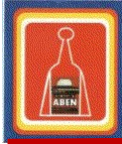
Note: NS = Not Significant at 0.05.

From the result presented on the t-test statistics in Table 4 above, it is shown that the p-value of 0.65 is greater than 0.05 level of significance at 166 degree of freedom. This indicated that there is no significant ($p < 0.05$) difference in the mean ratings of the responses of Business Education Lecturers and Instructors on strategic measures for application of Artificial Intelligence in Business Education research in Nigerian tertiary institutions. Therefore, the null hypothesis of no significant ($p < 0.05$) difference in the mean ratings of the responses of the Business education lecturers and Instructors is accepted for hypothesis two.

Discussion of Findings

This study on research question one identified the challenges in the application of Artificial Intelligence in Business Education research in Nigerian tertiary institutions to include: lack of comprehensive public policy on application of AI in education and research, poor knowledge of adaptive learning algorithms required for the use of AI for research conduct, inadequate funding of research and resources required for application of AI in research, lack of required infrastructure for effective use of AI for researches in Nigerian tertiary institutions, unstable power supply is a big challenge in the application of AI in research conduct, wide skill gaps and digital illiteracy in effective application of AI in Nigerian education and researches and weak educational framework that improves the teaching and learning of AI in Nigerian tertiary institutions among others. The findings of the study agreed with the report of Eke, Wakunuma and Akintoye (2023) who identified major problems in implication of Artificial Intelligence in research as; poor public policy on application of AI, poor knowledge of adaptive learning algorithms required for the use of AI, inadequate infrastructure for effective use of AI and high cost of training of researchers in effective use of AI. Similarly, the findings of the study also conformed with that of UNESCO (2019) that possible lack of AI local contents and inequalities of the disadvantaged population are more likely to be excluded from AI-powered education and research in developing countries constitute part of the challenges of the use of AI in education and research in Africa. Okolo, Aruleba and Obaido (2023) pointed that challenges of Artificial Intelligence usage in African continent can be blamed due to infrastructural decay associated with the lack of access to electricity and low investment into internet infrastructure.

This study on research question two identified strategic measures for application of Artificial Intelligence in Business Education research in Nigerian tertiary institutions to include: improved funding education and research with the required AI resources, provision of strong and stable internet services to stimulate the use of AI for research, incorporation of local contents into AI configuration for Nigerian education and research, adequate provision of necessary infrastructure



and AI-driven facilities to enhance AI education and researches, formulation of AI-driven policies by government for enhancing adoption of AI in education and research and special intervention fund or subsidy for Artificial Intelligence-powered researches. In agreement with the finding of this study, Tarus, Gichoya and Muumbo (2015) found that the expansion of e-learning infrastructure to facilitate the access to e-learning by students, provision of stable power supply, government and institutional funding for ICTs and training of teaching staff and other stakeholders. The findings of this study is also in tandem with that of Oketoobo (2021) who identified measures for stepping up the use of technologies in education and research to include: increased funding and provision of infrastructure such as electricity for driving educational technologies. Okolo, Aruleba and Obaido (2023) identified financial resources as means of improving internet infrastructure across Africa for AI-powered education and researches. In addition, the findings of this study corroborated that of UNESCO (2019) who identified measures for stimulating AI-powered education and research to include formulation of comprehensive public policy and development of quality and inclusive data systems that will drive AI-powered research and education.

Conclusion

The study examined the challenges and strategic measures for application of Artificial Intelligence (AI) in Business Education research in Nigerian tertiary institutions. From the findings that emanated from the study, it is concluded that there are obvious challenges undermining effective application of Artificial Intelligence in Business Education research in Nigerian tertiary institutions and that adoption of certain strategic measures in application of Artificial Intelligence in Business Education research in Nigerian tertiary institutions will enhance quality and efficiency of research with more reliable outputs in line with global standard.

Recommendations

Based on the findings of the study and the conclusion, the study therefore recommended that:

- i. There should be formulation of necessary Artificial Intelligence related policy that will help to drive effective and improved application of Artificial Intelligence in Nigerian education and research conducts.
- ii. There should be improved funding and provision of necessary Artificial Intelligence related infrastructures in Nigerian tertiary institutions for research and education use.
- iii. There should be constant training and retraining of academics on effective use of Artificial Intelligence facilities for teaching and learning and research conduct.

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