



APPLICATION OF ARTIFICIAL INTELLIGENCE IN COURSE DELIVERY BY BUSINESS EDUCATORS IN PUBLIC UNIVERSITIES IN CROSS RIVER STATE, NIGERIA

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Abstract

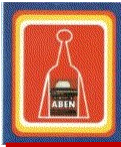
The study determined application of artificial intelligence in service delivery among business educators in public universities in Cross River State, Nigeria. Two research questions and two hypotheses guided the study. The population of the study was 48 business educators drawn from the two public universities in the State namely: University of Calabar and University of Cross River State. The entire population was studied since it was small and manageable. The instrument for data collection was structured questionnaire titled: Application of Artificial Intelligence in Business Education Course Delivery Questionnaire (AAIBECODEQ) which was validated by three experts: two in Business Education and one in Measurement and evaluation, in the Department of Business Education and Department of Educational Foundations, University of Calabar respectively. The Cronbach Alpha reliability index was used to determine the overall reliability coefficient of 0.85. Out of 48 copies of questionnaire administered, 45 copies were successfully retrieved. Mean and standard deviation were used to answer the research questions while independent t-test was used to test the hypotheses at 0.05 level of significance. The findings revealed problems and prospects of effective application of AI in business education course delivery which includes: unavailability of AI-based resources and tools in the universities, inability to develop appropriate pedagogical strategies using AI and provision of cybercrime reduction tools. The following recommendations were made among others: Software package providers should provide AI tools and resources suitable for Nigerian curriculum for easy application in business education service delivery.

Keywords: Business Education, Artificial Intelligence (AI), Business Education Delivery

Introduction

Technology is the solution to many problems in the world ranging from health, social, economic and educational problems. This has necessitated the quest for more sophisticated modern technologies for solution to more complex problems in the world. This led to the discovery of artificial intelligence which has the capacity to act like human intelligent. To keep pace with the development of technology and to solve most educational problems, educationists including business educators have adopted the use of artificial intelligence in service delivery.

Business education is a programme of study which comprises four parts- creating awareness in occupations, preparing youths for work in business occupations, preparing people to become better citizens and consumers of goods and services, and preparing business teachers (Azuka & Nwosu 2018). Also, Otum and Akeke (2023) mathematically summarized the term business education as follows: Business Education (BE) = Vocational Business Education (VBE) + General Business Education (GBE). That is, $BE = VBE + GBE$. Business education is that aspect of Vocational Education which involves the preparation of learner with relevant skills, knowledge, competencies ability values and experience needed to perform effectively in a specific business occupation either as employee or entrepreneur (Otum and Oduma 2022). Business education is an interrelated discipline that connects science (data and word processing, spread sheet, database management), mathematics (business mathematics and statistics), humanities



(business communication, comparative management), law (business law), economics (micro and macroeconomics, marketing), and administration (office practice, office administration and management).

Artificial intelligence has been conceptualized by different experts. According to Al-Qasim in Ayad, Abdelghani, Halali, and Muwafak (2021), Artificial Intelligence was introduced by an American scientist known as John McCarthy in 1956 and who also defined it as "the science of intelligent machine engineering, especially smart computer software, or a branch of computer science that aims to create intelligent machines". Artificial Intelligence is a range of new methods and methods of programming accounting systems, which are used to develop systems that mimic certain elements of human intelligence, and allow them to conclude facts and laws that are represented in computer memory (Al-Jabri and Al-Issawi, 2020). Also, Kaplan and Haenlein in Sollosy and McInerney (2022), defined AI as systems to interpret external data and to learn and use those learnings to achieve a specific goal or task through adaption.

Artificial Intelligence is a highly sophisticated technological devices which imitate human intellectual acumen through technology training and imputation such knowledge using algorithms to perform task to ease human efforts and retain the information using computer memory. Artificial intelligence is a technological device that thinks and acts using human intelligence to successfully perform specialized tasks ordinarily done by man. Artificial intelligence is the use of human ingenuity to control technological equipment. AI is interdisciplinary, requiring the integration of data management, database systems, data warehousing, natural language processing, network analysis, social networking, optimization, and statistical analysis.

As a field of study, business education plays a vital key role in forming the future workforce and manpower development by providing students with the fundamental knowledge and skills required for the rapidly changing business world. AI integration has the capacity to be beneficial to business education, including personalized learning, increased engagement, and the growth of critical thinking and problem-solving abilities (Luckin, Holmes, Griffiths & Forcier, 2016). The educational experience can be readily revolutionized by AI-driven systems that offer real-time feedback, adaptable learning pathways, and access to a wide range of resources (Schmidt & Cohen, 2013). According to Elhajjar, Karam and Borna in Surugiu, Grădinar and Surugiu (2024) opined that integrating AI into business education will assist to equip students with skills essential for future jobs and digital society's demands. Cope, Kalantzis and Sears (2021) underline the role of AI in the assessment process, not in the conventional form, but especially related to tracking progress and providing "just-in-time" feedback. Huang and Rust (2018) examined potential benefits of AI for fostering the entrepreneurial skills of college students. Their research indicates that AI tools such as machine learning and predictive analytics significantly improved students' ability to identify commercial opportunities and provide innovative solutions. Also, Saheb (2020) study examined the impact of AI on the critical thinking and problem-solving skills of business students. He found that the utilization of artificial intelligence (AI) tools, like virtual reality and simulation software, promoted a more dynamic learning environment that improved students' critical thinking and entrepreneurial skills. Similarly, Zawacki-Richter, Marín, Bond, and Gouverneur (2019) reviewed a comprehensive analysis of AI applications in higher education. The review highlighted the increasing application of AI technology in customized education and stated that these tools have the potential to significantly enhance business education by helping students develop their entrepreneurial skills and by tailoring the curriculum to their individual needs.

Many Universities and Colleges have begun incorporating AI-based tools and approaches into their curricula, ranging from foundational business courses to specialized programs in data



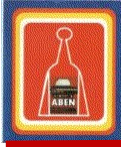
science and machine learning (Davenport & Ronanki, 2018). Several aspects of education have improved as a result of these artificial intelligence (AI) tools and techniques, including: Students' ability to use AI-powered tools to analyze and visualize large datasets (Huang and Rust, 2018), students ability to employ AI algorithms to create realistic business simulations (Nambisan, 2017), Increase in Personalized learning through the use AI-powered adaptive learning systems to modify assignments and assessments to suit the needs of students and improving academic performance (Nambisan, Wright & Feldman, 2019). In addition, application of Artificial Intelligent in business education course delivery has the following benefits: Motivating students learning habit; improving students' performance; increasing productive interactions and relationships among students and lecturers as well as empowering students with diverse online skills and encouraging inveterate learning. The major motive of application of Artificial Intelligence is to refine and erect both students' learning and lecturers' service delivery skills as well as ensuring effective learning and teaching process both in the classroom and outside the classroom environment.

Despite the benefits of incorporating AI into business education, there are a number of challenges that educators must be overcome before AI can be widely implemented and utilized in business education in Cross River State universities. These challenges include: Many business educators' inability to successfully integrate AI into their curriculum (Davenport and Ronanki, 2018). According to Nambisan et al. (2019), it is critical to carefully consider how AI fits with overall learning objectives and outcomes when incorporating it into business school courses. There is high threat of cybercrimes associated with proliferation of internet access and fraudsters hack into people's bank account, email and other sensitive private information (Okute, Enang and Etoma, 2022). This online crime has scared most business educators from the use of AI in work performance.

Other challenges include lack of qualified personnel, resistance to change, financing and inadequate infrastructure (Oladipo, 2018). Furthermore, these difficulties are made worse by the difference in advancement of technology between urban and rural areas, which results in unequal access to high-quality education (Adebayo & Iweala, 2020). Also, Amadi and King (2018) posited that the high cost of acquiring, installing and maintaining Information Communication technology has greatly hindered the acquisition of skills among Business Education students in Nigeria. Similarly, Oduma and Otum (2022) identified infrastructure, finance, students and lecturers as factors that hinder the use of modern technology in educational pedagogy, while Adebayo & Iweala, (2020), identified limited access to dependable internet and contemporary computing facilities. Financial limitations also make these difficulties worse.

Universities' capacity to invest in essential resources and training programs is severely restricted by a widespread problem of inadequate funding for technology breakthroughs including AI integration (Eze, 2019). Furthermore, Otum and Akerele (2019) highlighted the following problems of ICT utilization as: inadequate provision of modern technologies, lecturer's poor skill up-date and irregular power supply mitigate against the effective implementation of the Business Education curriculum.

Notwithstanding the challenges associated with application of AI, it is impossible to discount AI's potential to improve business education. Effective methods and solutions must be explored immediately in order to remove the obstacles preventing the successful integration of AI in the educational sector (Ibrahim, 2021). The ethical and sociological implications of AI must also be considered to guarantee that it is included into higher education in a responsible and inclusive manner (Davenport & Ronanki, 2018). Also, Otum and Akerele (2019) identified some strategies for overcoming challenges of application of AI as adequate provision and installation of emerging



technologies, collaboration between institutions and industries as well as provision of alternative power supply during lectures. Infrastructure Enhancement through free access to relevant AI tools and platforms, modernizing computer facilities, and enhancing internet connectivity. (Nambisan, 2017). Capacity Building, Training and Retraining through collaboration with IT firms and business leaders might yield useful resources and training and retraining chances of personnel handling the AI courses. Financial Support and Resource Allocation through diaspora funding should be encouraged.

Statement of the Problem

The application of artificial intelligence (AI) in business education holds great promise for improving learning outcomes and providing students with the necessary skills to thrive in the constantly evolving corporate landscape. Artificial intelligence is a relief to business educators from strenuous activities of service delivery and as an innovative way of lecture delivery to ensure students acquisition of adequate technological skills needed in the modern offices, industries and businesses. Although promising, the use of AI in Nigerian universities especially in Cross River State has not been feasible. Though, many scholars have emphasized the need for application of AI tools in teaching and learning, yet effective application of Artificial Intelligence in business education service delivery is still unrealistic in Nigeria especially Cross River State. Therefore, this study aimed to methodically pinpoint the main barriers to AI application business education service delivery, and offer calculated strategies to get around them.

Purpose of the Study

This study's main goal is to investigate the factors that militate against the effective application of artificial intelligence (AI) in business education and possible solutions in Universities in Cross River State, Nigeria. Specifically, this study aimed to:

1. Investigate the problems of effective application Artificial Intelligence in business education service delivery by Business Educators in Public Universities in Cross River State.
2. Ascertain the prospects of effective application of AI in business education service delivery by Business Educators in Public Universities in Cross River State.

Research questions

This study addressed the following questions;

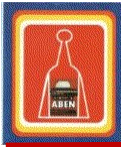
1. What are the Problems of effective application Artificial Intelligence in business education service delivery by Business Educators in Public **Universities** in Cross River State?
2. What are the Prospects of effective application Artificial Intelligence in business education service delivery by Business Educators in Public Universities in Cross River State?

Research Hypotheses

1. There is no significant difference between the responses of respondents on Problems of effective application Artificial Intelligence in business education service delivery **by Business Educators in Public Universities** based on gender (male and female)
2. There is no significant difference between the responses of respondents on the Prospects of effective application Artificial Intelligence in business education service delivery **by Business Educators in Public Universities** based on ownership (Federal or State).

Research Methodology

The study adopted descriptive research design. The area of study was Cross River State which harbours many tertiary institutions including federal, state and private institutions. In the



course of this study, only public universities were considered, namely: University of Calabar (Unical - federal) and Cross River State University (Unicross - State). The two public universities in Cross River State who offer business education namely: University of Calabar and University of Cross River State. The population was forty-eight (48) comprising of Thirty-two (32) and sixteen (16) Business Educators from the two universities respectively. Purposive sampling method was adopted. Purposive sampling is a non-probability sampling technique where the researcher intentionally selects participants based on specific characteristics or criteria relevant to the research question in selecting universities that represent a diverse range of characteristics, such as size (large, medium, small) and ownership (federal or state). This method helps the researcher to gather detailed and valued insights about the topic. This is necessary because within each selected university, participants were business education academic staff who are involved in business education course delivery. Again, since the entire population size is below one hundred (100), the entirety of the population was sampled thereby serving as the sample size. The instrument for data collection was structured questionnaire titled Application of Artificial Intelligence in Business Education Course Delivery Questionnaire (AAIBECDQ). The instrument was structured considering the purposes of the study, the research questions and the research hypothesis. The instrument was made up of two sections namely: A and B. Section A contained information on three demographic variables namely: name of institution, sex, ownership of university (federal and state). Section B was divided into two sub sections. Sub section A consisted of 10 items measuring the: Problems of effective application of Artificial Intelligence in business education course delivery. Sub section B consisted of 10 items measuring the prospects of effective application of Artificial Intelligence in business education course delivery. The items were arranged on a four-point rating scale. The response options for sub section A and B were Strongly Agree (SA) -4 points, Agree (A) - 3 points, Strongly Disagree (SD) -2 points, Disagree (D) - 1 point. The instrument was validated by three experts viz: two business educators and one measurement and evaluation expert whose corrections and suggestions helped to improve the quality of the instrument. The reliability of the instrument was tested using Cronbach Alpha reliability index which gave a reliability coefficient of 0.85. The researchers personally administered the copies of questionnaire to the respondents. Direct delivery and retrieval method were adopted in the administration and retrieval of the questionnaire. However, out of 48 copies of the questionnaire printed, 45 copies were successfully administered and retrieved. Using the data collected, mean and standard deviation were used to answer the research questions while independent t-test was used to test the null hypotheses at 0.5 Level of significance. The degree of agreement or disagreement was determined by finding the mean of the nominal values assigned to each option. Based on the 4-point rating scale, the mean score of the scale was 2.50. **The mean score** was derived by adding the nominal value of the rating scales and divided by the same number of cases. Therefore, 2.50 was used as the benchmark for the decision rule. Any item in the instrument with a mean score of 2.50 and above was seen as a problems and prospects of effective application of Artificial Intelligence in business education service delivery. For testing the hypothesis, the decision rule was to reject H_0 if and only if, the calculated value (t_{cal}) is greater than or equal to (\geq) the tabulated value (t_{tab}), otherwise accept.

Results:

Research Question 1: What are the Problems of effective application Artificial Intelligence in business education service delivery in Cross River State? The answer to this research question is presented Table I.



Table1:Mean and standard deviation on problems of effective application Artificial Intelligence in business education service delivery.

S/ N	Problem Statement	MALE			FEMALE		
		Mean	SD	Rmks	Mean	SD	Rmks
1	Poor AI competence among business educators	3.00	0.70	Agree	3.50	0.60	Agree
2	Moral queries of data privacy and algorithmic bias	2.50	0.67	Agree	3.50	0.65	Agree
3	Poor staff development programme strategy	2.80	0.80	Agree	3.00	0.70	Agree
4	unavailability of AI-based resources and tools in the universities	3.10	0.65	Agree	3.40	0.55	Agree
5	Inability to develop appropriate pedagogical strategies using AI	2.70	0.78	Agree	3.10	0.68	Agree
6	Inability to coordinate AI integration with business education objectives	2.60	0.77	Agree	3.00	0.67	Agree
7	Educators are still in the dark on benefits of AI in service delivery	2.67	0.82	Agree	3.10	0.72	Agree
8	Inability of the universities to provide free WIFI in the school	2.80	0.70	Agree	3.50	0.60	Agree
9	Security threat nature of AI	2.50	0.80	Agree	3.20	0.70	Agree
10	Poor supply of electricity in the university.	2.90	0.72	Agree	3.30	0.62	Agree
Grand Mean		2.76	0.74	Agree	3.26	0.65	Agree

Table 1 reveals that all the items have mean scores greater than and equal to 2.50 which means that the respondents agreed to all the items as problems of effective application of AI in business education service delivery.

Research Question 2: What are the prospects of effective application of Artificial Intelligence in business education service delivery in Cross River State? The answer to this research question is presented in Table.

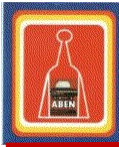


Table2:Mean and standard deviation on prospects of effective application Artificial Intelligence in business education servicedelivery.

S/N	Items	Male Mean	SD	Rmks	Female Mean	SD	Rmks
1.	Business educators should ensure adequate AI competence acquisition among them,	3.50	0.65	Agree	3.80	0.45	Agree
2.	Technologists should software for data privacy and algorithmic bias elimination	3.20	0.70	Agree	3.60	0.50	Agree
3.	University should provide staff development programme on proper integration of AI tools in pedagogy	3.00	0.75	Agree	3.50	0.60	Agree
4.	There should be adequate provision of AI-based resources and tools in the university	3.10	0.65	Agree	3.70	0.45	Agree
5.	Appropriate pedagogical strategies using AI should be developed	3.00	0.70	Agree	3.40	0.55	Agree
6.	There should be a match between AI integration and business education objectives	2.90	0.80	Agree	3.30	0.60	Agree
7.	Educators should conduct research on benefits of AI in service delivery	3.00	0.75	Agree	3.50	0.60	Agree
8.	Management should provide free WIFI in all parts of the university	2.80	0.70	Agree	3.40	0.55	Agree
9.	Software developers should provide cyber-crime reduction tools	3.10	0.65	Agree	3.60	0.50	Agree
10.	University alumni and philanthropists should assist in providing alternate power supply to reduce financial burden of the management	3.20	0.70	Agree	3.70	0.55	Agree
Grand Mean		2.78	0.71	Agree	3.55	0.54	Agree

Table 2 reveals that all the items on the questionnaire have mean scores above 2,50 which means thatboth male and female respondents agreed that all the items are prospects of effective application of AI in business education.

Test of Hypothesis

Hypothesis 1: There is no significant difference between the responses of respondents on Problems of effective application Artificial Intelligence in business education service delivery in Cross River State based on gender (male and female)

Table 3: Summary of T-test result of responses of respondents on Problems of effective application Artificial Intelligence in business education service deliverybased on gender.

Respondents	No.	Mean	SD	Df	T-cal	p-Value	Level sig	of Decision
Male	26	16.38	3.16	43	1.68	0.002	0.05	Not Sig.
Female	19	14.72	2.83					

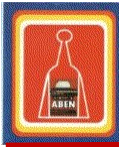


Table shows a t-calculated value of 1.68 (which is less than t-tabulated value of ± 1.98) and a P-value of 0.002 which is less than 0.05 level of significance. Consequently, the null hypothesis was accepted indicating that there is no significant difference between the responses of respondents on Problems of effective application Artificial Intelligence in business education service delivery in Cross River State based on gender in Cross River State.

Hypothesis 2: There is no significant difference between the responses of the lecturers on the Prospects of effective application Artificial Intelligence in business education service delivery in Cross River State based on ownership (Federal or State)

Table 4: Summary of T-test result of responses of respondents on Prospects of effective application Artificial Intelligence in business education service delivery in Cross River State based on ownership (Federal or State).

Respondents	No.	Mean	SD	Df	t-cal	Pvalue	Level of sig	decision
Federal	30	15.42	4.32	43	1.33	0.01	0.05	Not Sig.
State	15	16.19	3.05					

The data in the above Table reveals a t-calculated value of 1.33 (which is less than t-tabulated value of ± 1.984) and a P-value of 0.0067 which is less than 0.05 level of significance. Therefore, the null hypothesis was accepted showing that there is no significant difference between the responses of the lecturers on the Prospects of effective application Artificial Intelligence in business education service delivery in Cross River State based on ownership (Federal or State). This shows that all the respondents share similar view irrespective of the ownership of their universities.

Discussion of findings

The result of table1 revealed that there are various problems facing effective application of Alin business educationservice delivery such as poor AI competence among business educators, moral queries of data privacy and algorithmic bias, Poor staff development programme strategy, unavailability of AI-based resources and tools in the universities, Inability to develop appropriate pedagogical strategies using AI, Inability to coordinate AI integration with business education objectives, most business Educators are still in the dark on benefits of AI in service delivery, Inability of the universities to provide free WIFI in the school. Security threat nature of AI and Low level of mathematical competence among educators.This is supported by Okute, Enang and Etoma (2022) who stated there is high threat of cybercrimes associated with proliferation of internet access and fraudsters hack into individuals bank account, email and other sensitive private information. Eze, (2019), who identified inadequate funding for technology as a hinderance to AI integration into business education and Oduma and Otum (2022) who identified infrastructure, finance, students and lecturers as factors that hinder the use of modern technology in educational pedagogy, while Adebayo & Iweala, (2020), identified limited access to dependable internet and contemporary computing facilities.

The findings revealed various prospects of effective application of AI business education service delivery such asadequate AI competence acquisition among them, technologists should develop software for data privacy and algorithmic bias elimination, University shouldprovide staff development programme on proper integration of AI tools in pedagogy, there should be adequate provision of AI-based resources and tools in the university, appropriate pedagogical strategies using AI should be developed, There should be a match between AI integration and business



education objectives, Educators should conduct research on benefits of AI in service delivery, management should provide free WIFI in all parts of the university, educators should conduct research on benefits of AI in service delivery, software developers should provide cyber-crime reduction tools and software and university alumni and philanthropists should assist in providing alternate power supply to reduce financial burden of the management. This is in consonant with the opinion of Zawacki-Richter, Marín, Bond, and Gouverneur (2019) who stated that tools have the potential to significantly enhance business education by helping students develop their entrepreneurial skills and by tailoring the curriculum to their individual needs. Also, the finding is supported by (Huang & Rust, 2018) who mentioned the need for provision of Artificial intelligence (AI)-based tools and techniques.

Conclusion

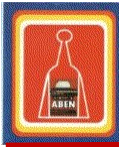
The swift advancement of artificial intelligence (AI) has significantly transformed educational sector as such the problems of application of AI in business education should be given adequate attention, considering the prospects identified in this work. This is to ensure that business education keeps pace with the development of technologies across the globe and improve the technological skills acquisition among its graduates for favourable competition in business and work environment.

Recommendations

1. There should be adequate provision of AI-based resources and tools in the universities for effective utilization of AI in business education pedagogy.
2. Software developers should provide cyber-crime reduction tools to encourage business educators adoption of AI.

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