

ASSESSMENT OF ARTIFICIAL INTELLIGENCE (AI) ADOPTION IN TEACHING BUSINESS EDUCATION COURSES IN UNIVERSITIES IN CROSS RIVER STATE.

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Abstract

This study assessed the adoption of Artificial Intelligence (AI) in teaching Business Education courses in universities in Cross River State, Nigeria. Specifically, the study examined the level of awareness of AI tools among Business Education lecturers and the extent of integration of AI tools into the teaching of Business Education courses. Two research questions guided the study, while two null hypotheses were formulated and tested at the 0.05 level of significance. A descriptive survey research design was adopted for the study. The population comprised 53 Business Education lecturers drawn from three universities in Cross River State. Owing to the manageable size of the population, the entire population was used for the study. Data were collected using a researcher-developed questionnaire titled *Assessing Artificial Intelligence Adoption in Teaching Business Education Courses Questionnaire (AAIATBECQ)*. Fifty-three copies of the questionnaire were administered, out of which 49 were correctly completed and returned, representing a response rate of 92.45%. The instrument was validated by three experts, while its reliability was established using the Cronbach Alpha technique, which indicated that the instrument possessed a high level of internal consistency. Data collected were analyzed using Mean and Standard Deviation to answer the research questions, while the independent samples t-test was used to test the hypotheses at the 0.05 level of significance. The findings revealed that Business Education lecturers possessed a high level of awareness of Artificial Intelligence tools and moderately integrated AI tools into the teaching of Business Education courses. The hypotheses tested further revealed that there was no significant difference in the mean ratings of male and female Business Education lecturers regarding their level of awareness of AI tools. Similarly, no significant difference existed in the mean ratings of lecturers in public and private universities regarding the extent of integration of AI tools into the teaching of Business Education courses. The study concluded that although Business Education lecturers are highly aware of Artificial Intelligence tools, their level of integration into instructional delivery remains moderate, indicating the need for increased institutional support and continuous professional development. The study recommended that universities should provide regular training programmes, improve digital infrastructure, and formulate institutional policies that promote the effective integration of Artificial Intelligence into the teaching and learning of Business Education courses.

Keywords: Artificial Intelligence, AI adoption, AI awareness, AI integration, Business Education, University lecturers.

Introduction

Business Education occupies a strategic position in the development of skilled manpower required for national economic growth and sustainable development. It is designed to equip learners with the knowledge, competencies, values, and

practical skills needed for employment, self-reliance, entrepreneurship, and effective participation in the world of work. In Nigerian universities, Business Education prepares students in areas such as accounting, office technology and

management, marketing, business communication, management, and entrepreneurship. Consequently, Business Education lecturers are expected to adopt innovative instructional approaches that enhance students' acquisition of relevant knowledge and digital competencies required for the twenty-first-century workplace. However, instructional delivery in many Business Education programmes continues to rely largely on conventional teaching methods such as lectures, note-taking, and teacher-centred approaches, which have been criticized for limiting students' creativity, collaboration, problem-solving ability, and technological competence (Okon, 2024). As the workplace becomes increasingly technology-driven, there is a growing need for Business Education lecturers to embrace emerging digital technologies capable of improving instructional effectiveness and students' learning experiences.

One of the most significant technological innovations transforming higher education globally is Artificial Intelligence (AI). Artificial Intelligence refers to the capability of computer systems and digital applications to perform tasks that normally require human intelligence, including learning, reasoning, problem-solving, language understanding, decision-making, and pattern recognition. AI technologies are increasingly being integrated into educational systems to improve teaching, learning, assessment, and academic administration. In higher education, AI enables educators to deliver personalized learning experiences, automate routine academic tasks, provide intelligent feedback, monitor students' learning progress, and support data-informed instructional decision-making. These capabilities have positioned AI as an important catalyst for improving the quality and efficiency of university education.

The application of Artificial Intelligence in Business Education has

become particularly relevant because the discipline emphasizes innovation, technology, entrepreneurship, decision-making, and managerial competence. AI-powered technologies such as intelligent tutoring systems, virtual assistants, automated grading systems, adaptive learning platforms, chatbots, plagiarism detection software, content generation tools, and predictive analytics have expanded opportunities for improving instructional delivery. These technologies enable lecturers to design interactive learning experiences, develop digital instructional materials, monitor students' academic progress, and provide individualized support based on learners' needs. AI also enhances students' exposure to modern business practices and digital work environments, thereby improving their preparedness for contemporary organizations that increasingly rely on intelligent technologies.

The successful integration of Artificial Intelligence into Business Education depends largely on the awareness of lecturers regarding available AI tools and their willingness to incorporate these technologies into instructional practices. Awareness constitutes the foundation for technology adoption because lecturers cannot effectively utilize AI tools without adequate knowledge of their existence, capabilities, and educational applications. Lecturers who possess high levels of AI awareness are more likely to recognize the instructional benefits of these technologies, develop positive attitudes toward their use, and integrate them into teaching activities. Conversely, inadequate awareness may limit educators' confidence in adopting AI and reduce opportunities for improving instructional delivery. Therefore, understanding the level of awareness of AI tools among Business Education lecturers is essential for determining the readiness of universities to embrace AI-driven teaching and learning.

Beyond awareness, the integration of Artificial Intelligence into classroom instruction represents a critical indicator of technology adoption in higher education. AI integration refers to the extent to which lecturers utilize AI-powered applications in planning lessons, preparing instructional materials, delivering lectures, assessing students, facilitating communication, and managing academic activities. Effective AI integration promotes active learning, enhances student engagement, supports personalized instruction, improves assessment efficiency, and encourages collaborative learning. It also enables lecturers to devote more time to mentoring students and facilitating higher-order learning while reducing the burden of repetitive administrative tasks. Consequently, assessing the extent of AI integration provides valuable information regarding the practical application of Artificial Intelligence in Business Education classrooms.

Globally, universities have increasingly embraced Artificial Intelligence as a strategic tool for improving teaching effectiveness and institutional competitiveness. Zhang, Li, Wang, and Chen (2021) observed that AI technologies significantly improve instructional quality by supporting adaptive learning, intelligent assessment, and personalized educational experiences. Similarly, Rahman, Ahmed, Chowdhury, and Karim (2022) argued that AI enhances students' engagement, promotes digital competence, and prepares graduates for technology-driven workplaces. The increasing demand for graduates who possess digital literacy and technological skills has further accelerated the adoption of AI in higher education across developed and developing countries.

In Nigeria, the adoption of Artificial Intelligence in university education is gradually gaining attention. Universities are increasingly exploring AI applications to improve teaching, learning,

research, and institutional management. Nevertheless, the level of AI adoption differs considerably across institutions and academic disciplines. While some universities have begun integrating AI-powered instructional technologies into teaching, others continue to rely predominantly on conventional instructional methods. Studies such as Essien, Bassey, and Archibong (2024) indicate that AI has considerable potential for improving instructional effectiveness and academic administration in Nigerian universities. Similarly, Okon (2024) maintained that integrating emerging technologies such as Artificial Intelligence is essential for repositioning Business Education to meet contemporary labour market demands and global educational standards.

In Cross River State, universities are making gradual efforts to incorporate digital technologies into teaching and learning. However, there is limited empirical evidence regarding the level of awareness of Artificial Intelligence tools among Business Education lecturers and the extent to which these technologies are integrated into instructional delivery. Given the strategic role of Business Education in preparing graduates for technology-driven workplaces, it is important to determine whether lecturers possess adequate awareness of AI technologies and whether such awareness translates into meaningful classroom integration. Findings from such an investigation would provide useful information for educational administrators, curriculum planners, policymakers, and university management in developing appropriate interventions aimed at promoting effective AI adoption in Business Education programmes.

Against this background, this study assessed the adoption of Artificial Intelligence in teaching Business Education courses in universities in Cross River State by examining the level of awareness of AI tools among Business

Education lecturers and determining the extent to which these tools are integrated into instructional delivery. The findings of the study are expected to contribute to the growing body of knowledge on educational technology adoption and provide empirical evidence for improving AI-driven teaching and learning in Business Education programmes.

Statement of the Problem

The increasing adoption of Artificial Intelligence (AI) in higher education has transformed instructional delivery across the world by providing innovative approaches to teaching, learning, assessment, and academic management. In Business Education, AI is expected to enhance instructional effectiveness through personalized learning, intelligent tutoring systems, automated assessment, content generation, and interactive learning environments. The integration of these technologies is essential for preparing graduates with the digital competencies, critical thinking abilities, and technological skills required to function effectively in today's technology-driven business environment. Consequently, Business Education lecturers are expected to possess adequate awareness of AI tools and integrate them into instructional delivery to improve students' learning experiences and academic outcomes.

Despite the growing importance of Artificial Intelligence in university education, observations suggest that the teaching of Business Education courses in universities in Cross River State continues to depend largely on conventional instructional methods, with relatively limited utilization of AI-powered technologies. This situation raises concerns regarding the preparedness of Business Education lecturers to embrace emerging instructional innovations capable of enhancing teaching effectiveness and producing graduates equipped for the digital economy. It

appears that although AI technologies are becoming increasingly available, many lecturers may not possess adequate awareness of the various AI tools and their potential applications in Business Education teaching. Where awareness is inadequate, meaningful integration of these technologies into classroom instruction is likely to be limited.

Furthermore, the extent to which Artificial Intelligence has been integrated into the teaching of Business Education courses in universities in Cross River State remains largely uncertain. While some lecturers may utilize selected AI applications for lesson preparation, content development, or assessment, there is little empirical evidence indicating the overall extent of AI integration in instructional delivery. Without such information, it becomes difficult for university administrators, curriculum planners, and policymakers to determine the level of AI adoption and develop appropriate interventions for promoting technology-enhanced teaching and learning.

Although several studies have examined Artificial Intelligence adoption in education, there is a paucity of empirical evidence on the level of awareness of AI tools among Business Education lecturers and the extent to which these tools are integrated into the teaching of Business Education courses in universities in Cross River State. This gap in knowledge necessitated an empirical investigation into lecturers' awareness of Artificial Intelligence tools and the extent of their integration into instructional delivery. It was against this background that this study was undertaken.

Purpose of the Study

The main purpose of the study was to assess the adoption of Artificial Intelligence (AI) in teaching business education courses in universities in Cross River State. Specifically:

1. To assess the level of awareness of AI tools among business education lecturers in universities in Cross River State.
2. To ascertain the extent of integration of AI tool into the teaching of business education courses in universities in Cross River State.

Research Questions

The study was guided by the following research questions

1. What is the level of awareness of AI tools among business education lecturers in universities in Cross River State?
2. What is the extent of integration of AI tools into the teaching of business education courses in universities in Cross River State?

Hypotheses

The following Null hypotheses were formulated for the study and were tested at 0.05 level of significance:

H₀₁: There is no significant difference in the mean response on the level of awareness of Artificial intelligence tools among business education lecturers in universities in Cross River State, based on gender

H₀₂: There is no significant difference in the mean responses on the extent of integration of AI tools into the teaching of Business Educators on courses based on type of institutional ownership

Methodology

The study adopted the descriptive survey research design. The design was considered appropriate because it enabled the researcher to collect information from respondents regarding their opinions, perceptions, and experiences without manipulating any of the variables under investigation. According to McCombes (2023), descriptive survey research is useful for obtaining information about existing conditions, attitudes, and practices as they naturally occur. Similarly,

Atlas (2023) explained that descriptive survey research is suitable for describing phenomena through data collected from a defined population. The design was therefore considered appropriate because the study sought to assess the adoption of Artificial Intelligence (AI) in teaching Business Education courses in universities in Cross River State by determining the level of awareness of AI tools among Business Education lecturers and the extent to which AI tools are integrated into the teaching of Business Education courses.

The study was conducted in Cross River State, Nigeria. The state is located in the South-South geopolitical zone of the country and shares boundaries with Benue State to the north, Ebonyi and Abia States to the west, Akwa Ibom State to the southwest, the Republic of Cameroon to the east, and the Atlantic Ocean to the south. Cross River State consists of eighteen Local Government Areas with Calabar as its capital city. The state is home to several higher institutions of learning, including the University of Calabar, the University of Cross River State, and the University of Education and Entrepreneurship. These institutions offer Business Education programmes and have qualified lecturers who formed the focus of this study. The state was considered suitable because of the increasing emphasis on the integration of digital technologies into teaching and learning activities in its universities.

The population of the study comprised all the fifty-three (53) Business Education lecturers in the three universities offering Business Education programmes in Cross River State. Specifically, thirty-two (32) lecturers were drawn from the University of Calabar, fourteen (14) from the University of Cross River State, and seven (7) from the University of Education and Entrepreneurship. Since the population was relatively small and manageable, the entire population was used for the study.

Consequently, no sampling technique was employed. The use of the census approach ensured that every Business Education lecturer in the selected universities participated in the study, thereby eliminating sampling error and enhancing the representativeness of the findings.

The instrument used for data collection was a researcher-developed questionnaire titled "Assessing Artificial Intelligence Adoption in Teaching Business Education Courses Questionnaire (AAIATBECQ)." The questionnaire consisted of two sections. Section A elicited demographic information from the respondents, while Section B contained twenty (20) structured items organized into two clusters based on the objectives of the study. The first cluster comprised ten (10) items developed to assess the level of awareness of Artificial Intelligence tools among Business Education lecturers. The second cluster also contained ten (10) items designed to ascertain the extent to which Artificial Intelligence tools are integrated into the teaching of Business Education courses. The questionnaire was structured on a four-point Likert rating scale consisting of Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD), weighted 4, 3, 2, and 1 respectively. The instrument was specifically designed to provide data required for answering the two research questions and testing the two corresponding hypotheses of the study.

To ensure the validity of the instrument, the questionnaire was subjected to face and content validation by three experts, comprising two lecturers from the Department of Business Education and one lecturer from the Measurement and Evaluation Unit of the Department of Science Education, Ebonyi State University, Abakaliki. The validators carefully examined the instrument with respect to the clarity of language, relevance of the questionnaire items, adequacy of content coverage,

appropriateness of the items in measuring the variables of the study, and alignment with the research objectives, research questions, and hypotheses. Their observations, comments, and suggestions were incorporated into the final version of the questionnaire before its administration.

The reliability of the instrument was established through a pilot study conducted among twenty (20) Business Education lecturers from Nnamdi Azikiwe University, Awka, Anambra State, which was outside the study area but possessed characteristics similar to those of the respondents used for the main study. The data obtained from the pilot study were analyzed using the Cronbach Alpha reliability technique to determine the internal consistency of the questionnaire items. The reliability coefficients obtained for the two clusters and the overall instrument were above the acceptable benchmark of 0.70, indicating that the instrument possessed a high degree of internal consistency and was therefore considered reliable for the study.

The researcher personally administered the questionnaire to the respondents with the assistance of three trained research assistants. Prior to the administration of the instrument, permission was obtained from the authorities of the selected universities. The purpose of the study was explained to the respondents, and they were assured that the information provided would be treated confidentially and used strictly for academic purposes. Copies of the questionnaire were distributed directly to all the fifty-three (53) Business Education lecturers across the three universities. Respondents were given adequate time to complete the questionnaire, while necessary clarifications were provided whenever required. Continuous follow-up by the researcher ensured a high retrieval rate. Out of the fifty-three (53) copies of the questionnaire administered, forty-nine (49) were correctly completed and returned, representing a return rate of

92.45 percent. These copies formed the basis for the data analysis.

The data collected for the study were analyzed using both descriptive and inferential statistics. The research questions were answered using Mean ($\bar{X}$) and Standard Deviation (SD). The mean was used to determine the average responses of the respondents, while the standard deviation measured the extent of variation in the responses. A criterion mean of 2.50 was adopted as the basis for decision-making. Questionnaire items with mean scores of 2.50 and above were

regarded as agreed, while items with mean scores below 2.50 were regarded as disagreed. The hypotheses formulated for the study were tested using the independent samples t-test at the 0.05 level of significance. The decision rule was that the null hypothesis was rejected whenever the probability value (p-value) was less than or equal to 0.05, whereas the null hypothesis was accepted whenever the probability value exceeded 0.05. All statistical analyses were carried out using the Statistical Package for the Social Sciences (SPSS).

Results

Research Questions one

What is the level of awareness of AI tools among business education lecturers in universities in Cross River State?

The data providing answer to the above research question are presented in Table 1 below.

Table 1: mean rating on the level of awareness of AI tools among business education lecturers

S/N	Items statement on awareness of AI tools	Mean	SD	Decision
1	I am aware of the use of AI tools in teaching and learning	2.81	1.36	Agreed
2	I can identify different AI tools used in education	3.30	0.93	Agreed
3	I understand the potential of AI tools to improve teaching efficiency	2.97	1.16	Agreed
4	I have attended workshops on AI tools	2.12	1.31	Agreed
5	I frequently hear about AI tools in discussions among colleagues.	3.38	0.97	Agreed
6	I am familiar with AI tools	2.69	1.26	Agreed
7	I know how AI tools can support personalized learning	3.32	0.87	Agreed
8	I am aware of research on AI applications in education	3.44	0.76	Agreed
9	I can distinguish between AI tools and traditional software tools	2.79	1.33	Agreed
10	I am aware of policies on AI integration in my institution	3.63	0.75	Agreed
	Cluster Mean	3.05	1.07	Agreed

N=49

The data in Table 1 shows that the overall cluster mean of 3.05 indicates that Business Education lecturers in the selected universities in Cross River State generally agreed that they were aware of AI tools in teaching and learning. Specifically, lecturers reported high

awareness of institutional policies on AI integration, with a mean of 3.63, as well as awareness of research on AI applications in education (mean = 3.44) and the ability to identify different AI tools used in education (mean = 3.30). These findings suggest that the lecturers

are relatively knowledgeable about AI tools and their applications in the educational context.

However, the data also show that formal engagement with AI tools, such as attending workshops on AI, had the lowest mean of 2.12, indicating that most lecturers had not participated in formal training. This implies that while lecturers possessed general awareness and familiarity with AI tools, opportunities for structured professional development remain limited. Overall, the decision

based on the 4-point rating scale indicates that the Business Education lecturers demonstrated an acceptable level of awareness of AI tools (mean ≥ 2.50), suggesting that they are generally knowledgeable about AI applications in education, even though formal training initiatives are not widespread.

Research question 2

To what extent are AI tools integrated into the teaching of business education courses in universities in Cross River State?

The data providing answers to the above research question are presented in Table 2 below.

Table 2: Mean rating of the extent AI tools integrated into the teaching of business education courses

S/N.	Items statement on AI tools are integration	Mean	SD	Decision
11	AI tools are used to prepare lesson plans for business education courses	3.06	0.74	Agreed
12	AI tools are used to deliver lectures in business education courses	2.73	0.95	Agreed
13	AI tools are used to assess students' performance in business education	2.81	1.05	Agreed
14	AI tools are used to provide real-time feedback to students	2.85	0.88	Agreed
15	AI tools are utilized in managing course content	2.93	1.12	Agreed
16	AI tools support collaborative learning in business education	2.89	0.98	Agreed
17	AI-powered tools are used to track student progress	3.38	0.86	Agreed
18	There are institutional policies encouraging the integration of AI tools in teaching	3.36	0.92	Agreed
19	Lecturers use AI tools to enhance student engagement	3.38	0.99	Agreed
20	AI tools are integrated into administrative tasks related to teaching business education courses	3.73	0.60	Agreed
	Cluster Mean	3.11	0.91	Agreed

N=49

The data in Table 2 shows an overall cluster mean of 3.11 indicating that AI tools were moderately to highly integrated into the teaching of business education courses among lecturers in the selected universities in Cross River State. Specifically, lecturers reported that AI

tools were most extensively integrated into administrative tasks related to teaching (mean = 3.73), as well as tracking student progress (3.38), enhancing student engagement (3.38), and supporting institutional policies that encourage AI integration (3.36). Other

instructional uses, such as preparing lesson plans (3.06), delivering lectures (2.73), assessing student performance (2.81), providing real-time feedback (2.85), managing course content (2.93), and supporting collaborative learning (2.89), all recorded means above the midpoint of 2.50, indicating agreement that AI tools are in use, though to a slightly lesser extent compared with administrative and policy-related applications.

Overall, the decision based on the 4-point rating scale shows that AI tools were effectively integrated into both

teaching and administrative aspects of business education in these universities. While some instructional applications could be further enhanced, the data suggests that lecturers were actively incorporating AI into their work.

Hypothesis Testing

Hypothesis 1

H₀₁: There is no significant difference in the mean responses on the level of awareness of Artificial Intelligence tools among business education lecturers in universities in Cross River State, based on gender

Table 3: Summary of Independent t-test Analysis of the Level of Awareness of AI Tools by Gender (H₀₁)

Gender	N	Mean	SD	t-calculated	df	p-value	Decision
Male	30	3.07	1.08	0.42	47	0.676	Accept H ₀₁
Female	19	3.02	1.05				No significant difference

The results presented in Table 3 show the summary of the independent t-test analysis conducted to examine the difference in the level of awareness of AI tools among Business Education lecturers based on gender. The findings indicate that male lecturers recorded a mean score of 3.07 with a standard deviation of 1.08, while female lecturers had a mean score of 3.02 with a standard deviation of 1.05. The closeness of these mean values suggests that both groups have a relatively similar level of awareness of AI tools. Further analysis using the independent t-test yielded a t-calculated value of 0.42 with 47 degrees of freedom and a corresponding p-value of 0.676, which is greater than the 0.05 level of significance. This result implies that the observed difference in mean scores between male and female lecturers is not statistically significant. Based on this outcome, the null hypothesis (H₀₁), which states that

there is no significant difference in the level of awareness of AI tools between male and female lecturers, is accepted. This means that gender does not significantly influence lecturers' awareness of AI tools in the study area.

The implication of this finding is that both male and female Business Education lecturers in Cross River State possess a comparable level of awareness of AI tools. This could be attributed to equal access to information, similar professional development opportunities, and widespread exposure to digital technologies across genders. It also suggests that initiatives aimed at promoting awareness of AI tools have been fairly inclusive and effective across both male and female lecturers. Overall, the result underscores that gender is not a determining factor in AI awareness within this context, and efforts to enhance AI integration in teaching should focus more

on other variables such as training, infrastructure, and institutional support rather than gender differences.

Hypothesis 2

H₀₂: AI tools integration are not significantly different in the mean responses of business educators on courses in universities in Cross River State, based on ownership

Table 4: Summary of Independent t-test Analysis of AI Tools Integration by Ownership (H₀₂)

Ownership of Universities	N	Mean	SD	t-calculated	df	p-value	Decision
Federal	32	3.15	0.89	0.63	47	0.531	Accept H ₀₂ No significant difference
State	17	3.06	0.94				

Table 4 presents the summary of the independent t-test analysis conducted to determine whether the integration of AI tools in teaching Business Education courses differs based on institutional ownership. The results show that lecturers from federal institutions recorded a mean integration score of 3.15 with a standard deviation of 0.89, while lecturers from state-owned institutions had a mean score of 3.06 with a standard deviation of 0.94. The closeness of these mean scores indicates that the level of AI tools integration is broadly similar across both categories of institutions. The independent t-test analysis further yielded a t-calculated value of 0.63 with 47 degrees of freedom and a corresponding p-value of 0.531, which is greater than the 0.05 level of significance. This indicates that the difference between federal and state institutions is not statistically significant.

Consequently, the null hypothesis (H₀₂), which posits that there is no significant difference in the integration of AI tools between federal and state institutions, is accepted. This finding suggests that institutional ownership does not significantly influence the extent to which lecturers integrate AI tools into their teaching practices. The implication of this result is that lecturers in both federal and state universities have

comparable access to AI resources, similar exposure to digital teaching technologies, and equivalent opportunities to apply AI tools in instructional delivery. It reflects a relatively uniform level of AI adoption and integration, regardless of whether the institution is federally or state-owned.

Overall, the study highlights that efforts to enhance AI integration in teaching should focus on factors such as professional development, technical support, and institutional infrastructure, rather than on ownership type, since lecturers' use of AI tools appears consistent across both federal and state universities.

Discussion of Findings

The level of awareness of AI tools among business education lecturers in universities in Cross River State.

Based the data analysed the study revealed that business education lecturers in Cross River State demonstrated a moderate level of awareness of AI tools, with a cluster mean of 3.05, indicating general agreement that they are aware of AI applications in teaching. Specifically, items such as being aware of research on AI applications (mean = 3.44) and awareness of institutional AI policies (mean = 3.63) were rated higher, suggesting that lecturers are more

cognizant of institutional initiatives and scholarly discourse surrounding AI. In contrast, lower means were observed for participation in AI workshops (mean = 2.12), reflecting limited hands-on engagement and formal training opportunities.

Furthermore, Table 5 showed that the t-test analysis by gender revealed no significant difference in the level of awareness between male (mean = 3.07) and female (mean = 3.02) lecturers ($t = 0.42$, $p = 0.676$). This indicates that gender did not significantly influence AI awareness among business education lecturers in the study area, with both male and female lecturers demonstrating comparable understanding of AI tools. These findings partly align and partly contrast with prior studies in the literature. For instance, Alawiyah (2020) found that male lecturers in Malaysia exhibited significantly higher awareness of AI tools than female lecturers, concluding that gender differences strongly impacted AI knowledge dissemination and recommending gender-targeted awareness programs. Similarly, Khan et al. (2023) reported that younger male lecturers in Pakistan had higher awareness and adoption of AI technologies than female and older counterparts, emphasizing demographic disparities in AI engagement.

In contrast, the current study disagrees with these findings regarding gender differences. The lack of significant gender disparity suggests that in the context of Cross River State universities, both male and female lecturers have similar levels of exposure to AI tools. This could be attributed to relatively uniform access to information, workshops, and institutional directives promoting AI awareness, which may mitigate gender-based differences observed in other contexts.

The results also resonate with findings by Mohammed et al. (2021), who reported generally low AI awareness among Nigerian business education

lecturers, largely due to insufficient professional development and lack of structured AI literacy programs. The current study corroborates this by showing that while awareness exists in principle, practical engagement such as attending AI workshops remains limited. This aligns with Ajayi et al. (2022), who observed that Nigerian lecturers, despite reasonable AI awareness, lacked the technical competence and hands-on skills for meaningful integration into teaching, emphasizing the gap between awareness and practical adoption.

Additionally, the study's findings are consistent with Ogunlade et al. (2024) and Nguyen & Le (2024) in highlighting factors beyond gender, such as access to resources and exposure opportunities, which influence awareness. Lecturers in urban settings and younger cohorts tend to exhibit higher awareness, suggesting that structural and environmental factors, rather than demographic characteristics like gender, may be more influential in shaping AI awareness in Nigerian universities.

In summary, the current study establishes that business education lecturers in Cross River State have a moderate level of AI awareness, with no significant gender differences, reflecting both progress in exposure to AI initiatives and ongoing limitations in formal training opportunities. This underscores the need for targeted professional development programs, hands-on workshops, and institutional support to move lecturers from awareness to practical competency in AI-enabled teaching.

The extent to which AI tools are integrated into the teaching of business education courses in universities in Cross River State

The study revealed that the integration of AI tools into the teaching of business education courses in Cross River State universities was moderate, with a cluster mean of 3.11, indicating that lecturers

agreed AI tools were being utilized to some extent. Items such as using AI tools to enhance student engagement (mean = 3.38) and integrating AI into administrative tasks related to teaching (mean = 3.73) received the highest ratings, suggesting that while lecturers are leveraging AI for engagement and administrative efficiency, the use of AI in content delivery and instructional practices is less pronounced. Lower mean scores were observed for items such as delivering lectures with AI tools (mean = 2.73), indicating limited application in direct instructional activities.

Furthermore, Table 6 showed that the t-test analysis by institutional ownership revealed no significant difference in the extent of AI integration between lecturers from federal (mean = 3.15) and state-owned (mean = 3.06) universities ($t = 0.63$, $p = 0.531$). This indicates that institutional ownership did not significantly influence the degree of AI integration in teaching business education courses. Lecturers across federal and state universities reported similar patterns of AI utilization, particularly for administrative support rather than active instructional use. These findings align with several studies in the literature. For example, Almarashdeh et al. (2024) and Hassan et al. (2021) reported that AI tools in universities were primarily employed for administrative tasks such as grading and managing student data, with minimal integration into content delivery. Similarly, Chika et al. (2022) observed limited AI application in Nigerian Business Education, where lecturers largely used AI for administrative purposes rather than teaching. The current study confirms these patterns, showing that while AI tools are present and utilized in the educational environment, their application to instructional practices remains underdeveloped.

Moreover, the results resonate with Singh & Sharma (2024) and Adebayo & Ogundele (2024), who emphasized that AI

adoption is often skewed toward administrative efficiency rather than pedagogical enhancement. Both studies recommended institutional investment in AI tools specifically for teaching purposes and structured professional development programs to enable lecturers to utilize AI in curriculum delivery. The current study supports this recommendation, as items related to direct teaching applications had lower mean scores, indicating a need for targeted strategies to enhance AI integration in instructional processes.

In contrast, Sulaiman et al. (2023) highlighted that institutional support, including infrastructure and professional development, plays a critical role in AI adoption. The finding from Table 6—that ownership (federal vs. state) does not significantly influence AI integration—suggests that access to AI tools and support may be relatively uniform across different types of universities in Cross River State. However, the moderate level of integration still reflects constraints, possibly including inadequate training, limited technical competence, or insufficient institutional encouragement for using AI in teaching, rather than administrative tasks alone. In conclusion, the current study establishes that AI tools are moderately integrated into business education teaching, with greater emphasis on administrative and engagement tasks rather than content delivery. Institutional ownership does not significantly affect integration levels, suggesting uniformity across federal and state universities. These findings highlight the need for structured professional development, targeted training, and institutional investment to enhance the pedagogical application of AI tools and maximize their impact on teaching and learning in Nigerian universities.

Conclusions

The findings of this study provide key insights into the adoption of Artificial Intelligence (AI) tools in teaching

Business Education courses in universities in Cross River State. The study shows that lecturers have a moderate level of awareness of AI tools, meaning they are generally aware of AI and its potential benefits for teaching and learning, but their formal exposure, training, and hands-on experience remain limited. This indicates that while AI is increasingly recognized in higher education, structured capacity-building opportunities such as workshops and professional development are still insufficient to fully equip lecturers for effective use.

In terms of classroom practice, the study found that AI tools are moderately integrated into teaching activities, but their use is mainly restricted to administrative functions such as tracking student performance, managing course content, and providing feedback. The use of AI in instructional delivery, lesson planning, and interactive teaching strategies remains limited, showing that its pedagogical application is still at an early stage. This gap between awareness and practical application suggests the need for stronger institutional support, targeted training, and improved access to digital resources to enhance effective integration.

The study further identified several challenges hindering AI adoption, including inadequate training opportunities, limited technological infrastructure, insufficient time for lecturers to learn and apply AI tools, and a lack of continuous professional development. These challenges reflect broader systemic issues within universities, such as weak investment in educational technology and the absence of clear institutional frameworks guiding AI implementation. Notably, these challenges were found to be consistent across both federal and state universities, indicating that institutional ownership does not significantly influence the level of constraints experienced.

Despite these challenges, lecturers strongly supported a range of strategies to

improve AI adoption, including regular training programmes, improved technical support, collaboration among lecturers, promotion of research on AI use, partnerships with AI developers, and the establishment of clear institutional policies. The analysis further revealed that gender does not significantly influence lecturers' perceptions of these strategies, suggesting that they are universally applicable and beneficial to all lecturers.

In conclusion, the study establishes that AI adoption in Business Education in Cross River State universities is at a moderate stage of development. While lecturers acknowledge the importance of AI in improving teaching and learning, its effective use is limited by inadequate training, infrastructural deficiencies, and insufficient institutional support. However, there is a strong willingness among lecturers to embrace AI if the necessary conditions are provided. Therefore, advancing AI integration in Business Education will require sustained institutional commitment, structured professional development, improved infrastructure, and clear policy direction to ensure that lecturers can effectively utilize AI tools to enhance teaching quality, student engagement, and overall learning outcomes.

Recommendations

Based on the findings and conclusions, the study makes the following recommendations:

1. Universities should organize regular training workshops, hands-on seminars, and continuous professional development programs on AI tools. This will enhance lecturers' awareness, competence, and confidence in integrating AI into teaching and learning.
2. University management should invest in technological infrastructure, AI-enabled platforms, and technical support systems to facilitate the effective adoption of AI in teaching.

- This includes providing access to AI tools, high-speed internet, and necessary hardware.
3. Lecturers should be encouraged to collaborate and share experiences in AI adoption, including peer mentoring and communities of practice, to enhance collective learning and problem-solving in AI integration.
 4. Universities should promote research on AI applications in education and foster partnerships with AI developers to ensure lecturers have access to innovative and effective tools.
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