ARTIFICIAL INTELLIGENCE AND CONTEMPORARY DEVELOPMENT IN BUSINESS EDUCATION: ISSUES AND CHALLENGES IN NIGERIAN TERTIARY INSTITUTIONS

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Abstract

This study explores the transformative role of Artificial Intelligence (AI) in shaping contemporary business education within Nigerian tertiary institutions, highlighting key issues and challenges that influence its adoption. As AI technologies continue to revolutionize global education, Nigerian universities face unique hurdles including infrastructural deficits, financial constraints, faculty resistance, curriculum gaps, and ethical concerns related to data privacy and equity. Using a descriptive approach, the research investigated Artificial Intelligence and Contemporary Development in Business Education: Issues and Challenges in Nigerian Tertiary Institutions. A total of 150 respondents participated in the study, comprising 80 business education lecturers (53.3%), 40 IT personnel (26.7%), and 30 academic administrators (20%). The respondents were drawn from tertiary institutions across five geopolitical zones of Nigeria. Data for the study was gathered through online Google form. Data collected were analyzed using **descriptive statistics** such as frequency counts, percentages, and mean scores to summarize responses. **Inferential statistics** (ANOVA) was used to determine correlations of the variables. The findings reveal that while AI adoption is still at an early stage, there is significant enthusiasm and recognition of its value among educators and students. However, addressing technological and cultural barriers through targeted investments and continuous professional development is essential for sustainable AI integration. The study concludes by envisioning a future where AI empowers Nigerian business education to deliver personalized, relevant, and globally competitive programs, thereby contributing to national economic growth and innovation.

Keywords: Artificial Intelligence (AI), Business Education, AI Integration, Contemporary Development

Introduction

The rapid advancements in technology have reshaped almost every sector, and education is no exception. Among these transformative technologies, Artificial Intelligence (AI) stands at the forefront, revolutionizing how teaching, learning, and administrative processes are carried out in educational institutions globally (Kose, & Yılmaz, 2022). In Nigeria, tertiary institutions are beginning to explore the possibilities that AI offers, especially in business education. Business education plays a crucial role in preparing students for leadership and managerial roles in an ever-evolving global economy. The integration of AI into business education could not only enhance learning outcomes but also improve administrative efficiency and bring the curriculum closer to the demands of the digital economy (Nwachukwu, & Chima, 2021). However, despite its potential, the implementation of AI in Nigerian tertiary institutions faces several challenges. Nigerian universities, like many others in developing countries, grapple with infrastructural deficiencies, limited access to AI resources, financial constraints, and resistance to change

(Ukwu, & Obinna, 2023). These challenges pose significant barriers to the seamless integration of AI in business education. While some institutions have begun experimenting with AI-based learning tools, the scale of adoption remains limited and uneven, making it essential to explore the issues and challenges that hinder the full integration of AI in Nigerian business schools (O'Neill, & McCalla, 2019). Artificial Intelligence (AI) has emerged as a transformative force across various sectors, including education. In Nigerian tertiary institutions, particularly within business education, AI presents both significant opportunities and formidable challenges. This duality necessitates a comprehensive examination to understand its impact on curriculum development, teaching methodologies, administrative processes, and ethical considerations (Suleiman, 2024)). Business education in Nigeria plays a pivotal role in equipping students with the requisite skills for leadership and management in a dynamic global economy. The integration of AI into this field promises to enhance personalized learning experiences, optimize administrative efficiency, and align curricula with the evolving demands of the digital economy. However, the adoption of AI is not without its obstacles. Institutions face challenges such as inadequate infrastructure, limited access to AI resources, financial constraints, and a shortage of qualified AI professionals. These issues hinder the effective implementation of AI in business education, potentially exacerbating existing educational disparities (Oluyemisi, 2024).

Recent studies highlight the transformative potential of AI in Nigerian tertiary education. For instance, AI technologies facilitate personalized learning, automate assessments, and optimize curriculum design by analyzing extensive datasets on student performance. These advancements address scalability issues and offer a dynamic approach to curriculum development that considers individual learner needs. Despite these benefits, the integration of AI faces significant hurdles. Nigerian universities often grapple with outdated curricula, limited access to AI resources, and a dearth of faculty trained in AI technologies. A report by GSMA underscores that the scarcity of professors with robust AI expertise and qualifications is a major challenge in Nigeria, impacting the quality of courses offered and limiting students' opportunities for practical learning (GSMA. (2024). Moreover, ethical considerations surrounding AI usage in education are gaining prominence. Issues such as data privacy, algorithmic bias, and the potential erosion of academic integrity due to over-reliance on AI tools like ChatGPT have been raised. A study by Izevbigie, Olajide, Olaniran, and Akintayo, (2025) emphasizes the need for universities to implement ethical frameworks, increase awareness of AI's risks, and establish responsible practices for its use. In response to these challenges, the Nigerian government has initiated programs aimed at bridging the AI knowledge gap. For example, a partnership with Google and Data Science Nigeria aims to train 25,000 educators, who will, in turn, teach 125,000 young people about AI, thereby fostering a more AI-literate workforce (Jaiyeola, 2024). This paper seeks to explore the multifaceted impact of AI on business education in Nigerian tertiary institutions. It aims to identify the opportunities AI presents, examine the challenges hindering its integration, and propose strategies to overcome these obstacles, thereby ensuring that AI contributes positively to the advancement of business education in Nigeria.

Overview of Business Education in Nigeria: Evolution and Importance of Business Education in Nigerian Tertiary Institutions

Business education in Nigeria has evolved significantly over the decades, shaped by the country's economic development goals, employment needs, and shifts in global educational trends. Originally designed to produce clerical workers during the colonial and early post-independence periods, business education has transitioned into a more comprehensive discipline aimed at equipping students with practical and theoretical knowledge in areas such as accounting, marketing, management, entrepreneurship, and now, digital business practices. Today, business education serves as a vital pillar in Nigeria's higher education system. It not only supports the development of middle- and high-level manpower for the public and private sectors but also contributes to national development through entrepreneurship and innovation. The

National Policy on Education emphasizes business education as an integral part of vocational and technical education, aimed at fostering self-reliance and economic participation (Federal Republic of Nigeria, 2013). Its importance is further amplified by the increasing need to reduce unemployment, stimulate small and medium-sized enterprises (SMEs), and foster a culture of innovation. In essence, business education plays a critical role in preparing graduates for both white-collar and self-employment opportunities, making it indispensable in the country's pursuit of economic diversification and sustainable development.

Current Status and Emerging Trends in Business Education

In recent years, business education in Nigerian tertiary institutions has witnessed both progress and persistent challenges. On one hand, there has been growing recognition of the need to incorporate digital skills and entrepreneurial thinking into the curriculum. Many institutions are beginning to embrace computer-based learning, introduce entrepreneurship training, and experiment with e-learning platforms. The rise of fintech, e-commerce, and digital marketing in Nigeria has also influenced some curricular adjustments. However, despite these advancements, a significant number of business education programs remain outdated, overly theoretical, and misaligned with industry demands. Employers frequently report a skills gap among graduates, particularly in areas such as digital literacy, communication, and analytical thinking (Adebisi & Oni, 2021). Moreover, limited access to technology, inadequate funding, and resistance to curriculum innovation continue to hinder meaningful progress. One of the most notable current trends is the increasing interest in integrating Artificial Intelligence (AI), data analytics, and digital business management into business education. As global business practices become more automated and data-driven, Nigerian institutions are beginning to realize the urgency of aligning their programs with international standards. However, the level of implementation remains low and uneven across institutions, primarily due to infrastructural and policy-related challenges (Nwazor & Godwin-Maduike, 2023). Another significant trend is the growing focus on entrepreneurial education as part of the business curriculum. Institutions are now encouraged to produce not just job seekers, but job creators. This aligns with Nigeria's national economic agenda, which emphasizes youth empowerment and innovation as pathways to economic growth. In conclusion, while business education in Nigeria has evolved from its clerical roots to a broader, skills-oriented discipline, much work remains to be done to modernize its content and delivery. The integration of technology, particularly AI, presents both a challenge and an opportunity for transformation. For business education to remain relevant, it must continuously adapt to the realities of the modern business world.

Artificial Intelligence (AI) in the Educational Sector

Artificial Intelligence (AI) refers to the ability of machines or computer systems to perform tasks that would typically require human intelligence. These tasks include learning from data (machine learning), understanding natural language, recognizing speech and images, making decisions, and problem-solving. In the context of education, AI encompasses a range of applications, from intelligent tutoring systems and adaptive learning technologies to automated grading systems and AI-powered learning assistants (Zawacki-Richter, Baecker & Marr, 2019). The scope of AI in education is vast and continues to expand. It includes personalized learning platforms that adapt to students' individual learning styles, AI-driven administrative tools that streamline school management, and predictive analytics that help educators anticipate student needs and outcomes. AI also plays a role in enhancing teaching materials, generating real-time feedback, and creating virtual learning environments where students can engage interactively.

The Role of AI in Reshaping Education Worldwide

AI is transforming education across the globe, acting as both a tool for improving learning experiences and as a catalyst for systemic change. Several key roles AI plays in reshaping education worldwide include:

i. **Personalized Learning**: One of the most exciting applications of AI is its ability to provide personalized learning experiences. AI can analyze a student's learning patterns, strengths, and weaknesses, adjusting content delivery to ensure each student receive the right level of challenge and support. Systems like adaptive learning platforms are revolutionizing the way students engage with material, helping them progress at their own pace (Baker & Inventado, 2020).
ii. **Improved Efficiency**: AI tools are automating administrative tasks such as grading, scheduling, and student assessments, which traditionally consume significant amounts of teachers' time. This allows educators to focus more on teaching and less on repetitive administrative work, improving overall educational efficiency.
iii. **Data-Driven Decision Making**: AI systems can process vast amounts of data to generate insights that inform decisions at every level of education from the classroom to the policymaker's office. Predictive analytics, for example, can identify students who may need extra support or predict outcomes based on current performance (Holmes, Bialik, M., & Fadel, 2019).
iv. **Global Access and Inclusivity**: AI has the potential to democratize education by making it more accessible to people worldwide. Online learning platforms powered by AI can offer high-quality education to individuals in remote or underserved areas, breaking down geographical and economic barriers to learning (Luckin, Holmes, Griffiths, & Forcier, 2016).

As AI technology continues to evolve, its impact on the educational sector will only grow, creating more opportunities for both students and educators to engage in more effective and innovative learning experiences.

AI's Potential for Revolutionizing Business Education in Nigeria

In the context of Nigeria, the potential for AI to revolutionize business education is immense, yet largely untapped. The global shift towards digitalization and data-driven decision-making underscores the need for business education systems to integrate AI to remain relevant. Here's how AI could reshape the landscape of business education in Nigeria:

i. **Enhanced Learning Outcomes**: AI can provide Nigerian students with personalized learning experiences that adapt to their individual needs, improving learning outcomes. This is particularly crucial for business education, where students need to grasp complex concepts in fields such as economics, finance, and management. AI-powered platforms can offer tailored learning paths that address each student's strengths and weaknesses, thereby enhancing their understanding and skills (Baker & Inventado, 2020).
ii. **Improved Pedagogy and Teaching Methods**: AI-driven tools can support Nigerian educators in transitioning from traditional, lecture-based methods to more interactive, student-centered approaches. For example, AI can help in automating assessments and providing real-time feedback, allowing lecturers to focus on fostering critical thinking and problem-solving skills. This shift can promote more engaging and effective learning experiences (Holmes et al., 2019).
iii. **Fostering Digital and Entrepreneurial Skills**: The integration of AI into business education in Nigeria can better prepare students for the demands of the digital economy. AI technologies such as machine learning, data analytics, and automation are central to modern business operations. By incorporating these technologies into business curricula, Nigerian universities can equip students with the digital competencies needed for entrepreneurship and leadership in a fast-evolving marketplace (Nwazor & Godwin-Maduike, 2023).
iv. **AI in Business Administration and Management**: AI's role in streamlining business processes through automation, predictive analytics, and data-driven decision-making can be embedded into the Nigerian business education curriculum. Students could be taught not just the theoretical aspects of business management but also practical, AI-powered

tools that businesses are increasingly relying on to gain a competitive edge (Luckin et al., 2016). This would prepare Nigerian graduates to thrive in the digital transformation of business environments.

v. **Overcoming Infrastructure Challenges**: While Nigeria faces significant infrastructure challenges, AI can help bridge some of the gaps by providing online and blended learning solutions. AI-driven platforms can bring quality business education to remote or underfunded institutions, helping to democratize access to world-class education without requiring major physical infrastructure investments (Zawacki-Richter, Baecker, & Marr., 2019).

AI holds the key to not just modernizing business education in Nigeria but also aligning it with the global shift toward data-driven, digital business practices. By integrating AI into the curriculum, enhancing pedagogical methods, and fostering digital entrepreneurship, Nigerian institutions can equip students with the skills needed to excel in an increasingly digital and globalized economy.

Global Trends in AI and Education: Global Examples of AI in Business Education

Across the world, Artificial Intelligence (AI) is reshaping business education by making learning more interactive, adaptive, and aligned with the rapidly changing business landscape. Leading universities and business schools have integrated AI into their curricula and learning environments to prepare students for the future of work. For instance, institutions like the Massachusetts Institute of Technology (MIT) and Stanford University leverage AI-driven simulations and data analytics tools to teach business strategy and financial modeling, enabling students to engage in real-time decision-making scenarios (Chen et al., 2022). Similarly, the London Business School uses AI-powered platforms to facilitate personalized coaching and skill development, tailoring learning pathways to individual student needs (Brown & Adams, 2021). In Asia, the National University of Singapore incorporates AI tools in courses on digital marketing and supply chain management, preparing students for tech-driven business ecosystems. These global examples demonstrate how AI is no longer an add-on but a fundamental pillar in modern business education, creating immersive and practical learning experiences that bridge theory and practice.

The Rise of AI-Driven Learning Tools, Smart Classrooms, and Personalized Learning

One of the most transformative trends in education worldwide is the adoption of AI-driven learning tools that enhance personalization and engagement. These tools harness data analytics and machine learning algorithms to adapt content, pacing, and assessment to each learner's unique profile, addressing individual strengths and areas for improvement (Luckin et al., 2016). **Smart classrooms** represent another significant innovation. Equipped with AI-powered technologies such as interactive whiteboards, voice recognition, and real-time analytics, smart classrooms facilitate more dynamic and interactive teaching. Educators can monitor student engagement levels, identify learning gaps instantly, and customize lessons accordingly (Holmes et al., 2019). This technology also enables flipped classroom models, where students interact with AI-driven content outside class and apply concepts during in-person sessions. AI-powered **personalized learning platforms** like Coursera, edX, and Khan Academy have scaled globally, offering adaptive courses in business-related subjects. These platforms use AI to recommend learning resources, provide instant feedback, and create custom learning paths, helping learners worldwide to acquire relevant skills efficiently (Baker & Inventado, 2020). The integration of AI in business education also extends to career development, with AI-based career coaching and job matching tools becoming common in universities globally. These systems analyze student competencies and market trends to provide tailored career advice, internships, and job placements, thus improving graduate employability (Chen et al., 2022).

AI in Nigerian Higher Education

Current Implementation and Adoption of AI in Nigerian Universities and Colleges

Artificial Intelligence is gradually making inroads into Nigerian higher education, though its adoption remains uneven and at an early stage compared to global trends. Several Nigerian universities and colleges have begun exploring AI's potential to enhance teaching, learning, and administrative efficiency, but the integration is often limited by infrastructural deficits, funding challenges, and a shortage of trained personnel (Adeleke & Oladipo, 2023). Major universities like the University of Lagos (UNILAG), Obafemi Awolowo University (OAU), and Ahmadu Bello University (ABU) have initiated pilot projects leveraging AI for academic purposes. These include the use of AI-based chatbots to provide 24/7 student support services, adaptive learning platforms for personalized coursework, and AI-driven tools to assist in research data analysis (Eze & Okafor, 2022). Furthermore, some institutions have incorporated AI modules into computer science and business education curricula, aiming to equip students with foundational AI knowledge and skills relevant to the evolving job market. Despite these promising developments, widespread institutional adoption is hampered by inconsistent internet connectivity, lack of awareness, and resistance to change among some academic staff. Nevertheless, government initiatives such as the National Artificial Intelligence Policy, released in 2021, are designed to promote AI education and research, which signals increasing institutional commitment toward AI integration (National Office for Technology Acquisition & Promotion, 2021).

Success Stories and Lessons Learned

Despite the challenges, there are notable success stories that illustrate AI's growing impact on Nigerian higher education:

i. University of Lagos (UNILAG): UNILAG has deployed AI-powered chatbots to handle student inquiries related to admissions, course registration, and exam schedules. This innovation has significantly reduced administrative bottlenecks and improved student engagement and satisfaction (Adeleke & Oladipo, 2023).
ii. Covenant University: Known for its focus on technology and innovation, Covenant University introduced AI-driven analytics to monitor student performance and provide early warnings for at-risk students. This proactive approach has helped improve retention and academic success rates (Eze & Okafor, 2022).
iii. Federal University of Technology, Akure (FUTA): FUTA recently integrated AI into its business management curriculum, emphasizing machine learning applications in financial modeling and marketing analytics. This initiative has been praised for preparing students for Nigeria's digital economy and bridging the gap between academic knowledge and industry needs (Nwazor & Godwin-Maduike, 2023).

Lessons Learned from these experiences highlight the importance of:

i. Investing in infrastructure: Reliable internet access and computing resources are essential for effective AI adoption.
ii. Capacity building: Training educators and administrators on AI tools and applications is crucial for sustainability.
iii. Policy support: Institutional policies that encourage experimentation and innovation help foster a culture of AI adoption.
iv. Stakeholder collaboration: Partnerships between universities, government agencies, and the tech industry accelerate resource sharing and expertise development.

Nigeria's higher education sector is still in the early phases of AI adoption, the successes achieved thus far offer valuable insights. With strategic investments and collaborative efforts, Nigerian universities can harness AI's transformative power to enhance teaching quality, streamline administration, and equip graduates with future-ready skills.

Benefits of AI in Business Education

Enhancing Learning Outcomes through AI-Based Learning Models: Artificial Intelligence is revolutionizing the way business education is delivered by making learning more personalized,

engaging, and effective. AI-based learning models, such as adaptive learning platforms and intelligent tutoring systems, tailor educational content to fit individual student needs, preferences, and learning paces. This customization not only boosts comprehension but also fosters deeper critical thinking and problem-solving abilities (Baker & Inventado, 2020). For example, AI-driven platforms can analyze a student's interaction patterns and adjust the difficulty of business case studies or simulations accordingly, ensuring learners remain challenged without being overwhelmed. This approach helps bridge gaps in understanding and encourages mastery of complex business concepts such as financial analysis, strategic management, and marketing analytics.

AI's Role in Skills Development for Business Professionals: In the rapidly evolving business landscape, continuous skills development is critical. AI facilitates this by offering dynamic, data-informed learning experiences that build both technical and soft skills. Business professionals trained through AI-enabled programs gain competencies in emerging areas such as data analytics, digital marketing, automation, and even ethical AI governance (Holmes et al., 2019). Moreover, AI-powered virtual coaches and simulation environments provide realistic scenarios where learners can practice decision-making and leadership skills in risk-free settings. This experiential learning is invaluable for preparing students and professionals to navigate complex business challenges confidently.

Data-Driven Decision-Making and Predictive Analysis in Business Education: One of the most transformative benefits of AI in business education lies in its capacity to harness big data for informed decision-making. AI tools enable students and educators to analyze vast datasets, uncover patterns, and generate actionable insights—skills that are crucial in today's data-driven business world. Predictive analytics, powered by machine learning algorithms, is increasingly incorporated into business curricula to teach students how to forecast market trends, customer behaviors, and financial risks. This practical training equips future business leaders with the ability to make evidence-based decisions, optimize strategies, and drive organizational success (Nwazor & Godwin-Maduike, 2023). Furthermore, AI enhances institutional decision-making by providing administrators with real-time data on student performance, course effectiveness, and resource allocation, thereby improving educational quality and outcomes.

Challenges in Integrating AI in Business Education

Technological, Financial, and Infrastructural Barriers: Despite the exciting potential of AI to transform business education, many institutions, especially in developing contexts like Nigeria, face significant hurdles in implementation. Technological barriers such as unreliable internet connectivity, outdated hardware, and lack of access to cutting-edge AI software often limit the seamless adoption of AI tools (Adeleke & Oladipo, 2023). Financial constraints compound these issues. The cost of procuring AI platforms, training staff, and maintaining infrastructure can be prohibitive for many universities already operating under tight budgets. This challenge is particularly pronounced in Nigerian tertiary institutions, where funding for technological innovation is inconsistent and sometimes insufficient (Eze & Okafor, 2022).

Resistance to Change among Faculty and Students: Another notable challenge is cultural resistance within educational communities. Faculty members accustomed to traditional pedagogical methods may be hesitant or unwilling to incorporate AI-driven approaches into their teaching. This resistance stems from a lack of familiarity with AI technologies, concerns about job security, or skepticism about the effectiveness of AI in education (Brown & Adams, 2021). Similarly, students may exhibit reluctance to engage with AI tools due to unfamiliarity or mistrust, preferring conventional classroom interactions. Overcoming this resistance requires sustained awareness campaigns, professional development for educators, and demonstration of AI's practical benefits to learners.

Curriculum Adaptation Challenges: Integrating AI into business education curricula presents its own set of difficulties. Existing courses often need significant redesign to embed AI concepts,

tools, and applications effectively. This adaptation requires interdisciplinary collaboration among subject experts, instructional designers, and AI specialists—an arrangement that many institutions struggle to coordinate (Nwazor & Godwin-Maduike, 2023). Moreover, keeping curricula current with rapidly evolving AI technologies is a continual challenge. The fast pace of AI innovation demands frequent updates to course content, which can strain institutional resources and faculty workload.

Data Privacy and Security Concerns: The use of AI in education inevitably involves collecting and processing vast amounts of student data, raising critical privacy and security issues. Institutions must navigate complex regulatory landscapes to ensure compliance with data protection laws and ethical standards (Holmes et al., 2019). In Nigeria, where digital data governance frameworks are still developing, the risk of data breaches, unauthorized access, or misuse remains a significant concern. Establishing robust cyber security measures and transparent data policies is essential to build trust among students and faculty and protect sensitive information.

Strategic Contemporary Issues and Challenges

Technological Barriers: One of the most pressing challenges facing AI integration in Nigerian business education is the lack of robust infrastructure**.** Many institutions struggle with unstable internet connectivity and limited access to the latest AI-powered educational tools, which hampers effective deployment (Adeleke & Oladipo, 2023). Additionally, there is a shortage of AI training and expertise among both faculty and students, limiting their ability to leverage AI technologies fully. Without targeted capacity-building initiatives, these technological barriers risk widening the digital divide within tertiary education (Eze & Okafor, 2022).

Financial Constraints: *The* high cost of AI technologies and their implementation *is another critical hurdle. Many Nigerian universities operate on limited budgets that prioritize immediate operational needs over long-term investments in AI research and infrastructure. This lack of dedicated funding curtails efforts to develop customized AI applications suited to local educational contexts (Nwazor & Godwin-Maduike, 2023). Furthermore, insufficient investment in AI-focused research and development impedes innovation and slows the adoption of AI-driven teaching and learning strategies.*

Faculty Resistance: *Resistance to change among faculty members remains a significant challenge. Many educators are reluctant to adopt AI tools, often due to unfamiliarity or concerns that AI might diminish their professional roles (Brown & Adams, 2021). This underscores the critical need for* continuous professional development *programs that equip faculty with the skills to integrate AI effectively into their teaching, as well as foster a culture that embraces technological innovation.*

Curriculum Limitations: *Current business education curricula frequently exhibit gaps when it comes to incorporating AI knowledge and practical applications. There is a growing recognition that* business programs must be updated *to reflect the realities of an AI-driven economy, including data analytics, automation, and ethical AI governance (Nwazor & Godwin-Maduike, 2023). Without curriculum reforms, graduates risk entering the workforce ill-prepared for emerging business challenges.*

Ethical and Security Concerns: The deployment of AI in education raises important *data privacy and security risks*. In Nigeria, where regulatory frameworks around digital data protection are still evolving, institutions must be vigilant about safeguarding student information from breaches and misuse (Holmes et al., 2019). Beyond security, there are *ethical questions* regarding AI's influence on educational equity such as biases embedded in AI algorithms that may disadvantage certain groups and the broader implications of AI decisions on fairness and inclusivity (Baker & Inventado, 2020). Addressing these concerns is essential to building trust and ensuring AI's responsible use in education.

Theoretical Framework: Educational Theories and AI Integration

Constructivist learning theories stress the importance of active, student-centered learning, where knowledge is developed through experience and interaction rather than passive absorption (Piaget, 1972; Vygotsky, 1978). Artificial intelligence (AI) aligns well with this perspective by creating adaptive, personalized learning environments that cater to individual learner needs and foster active participation. AI-based tools, including intelligent tutoring systems and virtual simulations, provide opportunities for learners to engage with business concepts interactively, reflect on feedback, and apply their understanding in real-world contexts. This resonates with constructivism's focus on scaffolding and situated learning, thereby enhancing the relevance and effectiveness of education (Luckin et al., 2016).

In parallel, the Technology Acceptance Model (TAM), introduced by Davis (1989), offers a valuable framework for examining AI adoption within Nigerian tertiary institutions. TAM highlights perceived usefulness and perceived ease of use as critical drivers of user acceptance. Applying this model helps to explain the extent to which faculty and students embrace AI tools in business education, based on factors such as their confidence in AI's contribution to learning outcomes and the simplicity of its interface (Venkatesh & Bala, 2008). Recent studies in Nigeria have utilized TAM to uncover both challenges and enablers of AI integration, underscoring the importance of targeted training and robust infrastructure to strengthen acceptance (Adeleke & Oladipo, 2023).

AI Models Relevant to Education

Two foundational AI technologies play critical roles in business education today:

i. Machine Learning (ML) involves algorithms that learn from data to make predictions or decisions without explicit programming. In business education, ML powers analytics tools that assess student performance, predict learning difficulties, and recommend personalized content (Baker & Inventado, 2020).

ii. Natural Language Processing (NLP) enables machines to understand and generate human language. NLP applications include AI chatbots that provide instant student support, grading automated assignments, and facilitating language-based learning activities in business communication courses (Holmes et al., 2019).

AI-based personalized learning systems combine these models to deliver adaptive content tailored to each student's progress and preferences. For example, AI chatbots assist with administrative queries and academic advising, freeing educators to focus on higher-value teaching tasks and enhancing the overall student experience (Eze & Okafor, 2022).

Statement of the Problem

The rapid advancement of Artificial Intelligence (AI) has transformed various sectors globally, including education. In the context of business education, AI has the potential to enhance teaching methods, streamline administrative processes, personalize learning, and improve student outcomes. However, despite these opportunities, the integration of AI into business education within Nigerian tertiary institutions remains limited and underexplored. Many institutions struggle with outdated curricula, inadequate digital infrastructure, and insufficient faculty training, which hinder the adoption and effective utilization of AI tools. Furthermore, there is a noticeable gap between the skills imparted through traditional business education programs and the competencies required in an AI-driven global economy. As a result, graduates often find themselves ill-equipped to thrive in increasingly automated and data-driven work environments.

Moreover, there is limited empirical research that investigates the specific challenges and contextual factors affecting the adoption of AI in Nigerian business education. Issues such as poor funding, lack of policy frameworks, resistance to change, and ethical concerns further complicate the integration process. Without deliberate efforts to address these problems, Nigerian tertiary institutions risk lagging behind in global educational innovation and failing to produce competitive business professionals. This study, therefore, seeks to examine the current state of

AI integration in business education, identify the key challenges faced by Nigerian tertiary institutions, and explore the implications for curriculum development, teaching practices, and policy formulation.

Research Questions

1. To what extent is Artificial Intelligence being integrated into business education programs in Nigerian tertiary institutions?
2. What are the major challenges hindering the effective adoption of AI in business education within Nigerian tertiary institutions?
3. How does the use (or lack) of AI affect the quality of business education in Nigeria?
4. What is the level of awareness and competence of educators in utilizing AI tools in business education?

Method

This study adopted a **descriptive survey research design**, which is appropriate for collecting data on current practices, challenges, and perceptions regarding the integration of Artificial Intelligence (AI) in business education. The design enabled the researchers to gather information from a large sample and analyze trends, relationships, and patterns in the data. The population consists of 150 **business education lecturers, IT staff, and administrative officers** in selected Nigerian tertiary institutions offering business education programs. This includes universities, polytechnics, and colleges of education across different geopolitical zones. A **purposive sampling technique** was used to select institutions that offer business education and have at least basic ICT infrastructure. Within these institutions, **stratified random sampling** was applied to select 150 respondents from different categories (lecturers, IT staff, and administrators) to ensure balanced representation. The sample size was determined based on available resources and statistical reliability. The primary instrument for data collection was a **structured online questionnaire**, comprising both closed-ended and open-ended items. The questionnaire was designed to gather information on: Awareness and understanding of AI in business education, current practices and extent of AI integration, challenges faced in adopting AI tools, perceived impact on teaching, learning, and administration and suggestions for improvement. The instrument was validated by lecturers in educational technology and measurement to ensure content and face validity. Data were collected through **online** questionnaires, depending on the accessibility of respondents. Follow-up calls and reminders were made to enhance response rates. Data collected were analyzed using **descriptive statistics** such as frequency counts, percentages, and mean scores to summarize responses. **Inferential statistics** (ANOVA), was used to determine relationships or differences between variables. Data from open-ended responses was analyzed thematically.

Results

Demographic Information of Respondents

A total of 150 respondents participated in the study, comprising 80 business education lecturers, representing 53.3% of the sample; 40 information technology (IT) personnel, representing 26.7%; and 30 academic administrators, representing 20% of the total respondents, drawn from 10 tertiary institutions spread across the five geopolitical zones of Nigeria, a composition which ensures that the data reflects multiple, complementary perspectives instructional, technical, and administrative — on AI integration in business education, with the predominance of lecturers being consistent with the study's core focus on instructional and curriculum-related dimensions of AI adoption, while the inclusion of IT personnel and academic administrators lends the necessary technical and institutional depth required for a comprehensive assessment of the phenomenon under investigation.

Extent of AI Integration in Business Education

Table 1: Extent of AI Integration in Business Education

AI Integration Area	Mean Score	Interpretation
Use of AI in teaching delivery	2.1	Low extent
Use of AI in student assessment	1.8	Very low extent
Use of AI in curriculum planning	2.0	Low extent
Administrative automation	2.5	Moderate extent

Respondents were asked to rate, on a 5-point Likert scale (1 = Not at all, 5 = Very high extent), the extent to which AI tools are presently integrated into teaching, learning, and administrative processes within their institutions, and the results indicate that AI utilization in teaching delivery (mean = 2.1) and curriculum planning (mean = 2.0) remains low, while its use in student assessment recorded the lowest mean score of 1.8, reflecting a very low extent of adoption that may be attributable to institutional caution regarding the reliability and academic integrity implications of AI-based grading, whereas administrative automation recorded the highest mean of 2.5, suggesting that AI tools have made comparatively greater, though still moderate, inroads into administrative functions than into core academic and pedagogical activities, most plausibly because administrative applications require less pedagogical redesign and lower technical sophistication from end-users; taken together, these findings indicate that AI adoption in business education is currently at an early, administratively-driven stage, with meaningful integration into teaching, assessment, and curriculum processes yet to materialize.

Challenges Facing AI Integration

Table 2: Challenges Facing AI Integration

Challenge	Frequency (n=150)	Percentage
Inadequate infrastructure	130	86.7%
Lack of trained personnel	112	74.7%
Poor funding	105	70.0%
Resistance to change	90	60.0%
Absence of AI-focused policies	98	65.3%

The results reveal that inadequate infrastructure was the most frequently cited barrier, identified by 86.7% of respondents, pointing to fundamental deficits such as unstable electricity and insufficient computing hardware as the single most significant constraint on AI adoption, followed closely by a lack of trained personnel (74.7%) and poor funding (70.0%), both of which indicate that human capacity and budgetary limitations compound the infrastructural gap, while the absence of AI-focused institutional policies (65.3%) points to a governance deficit in strategic planning for AI adoption, and resistance to change, though the least-ranked challenge, still affected a clear majority of respondents (60.0%), indicating that attitudinal barriers persist alongside the structural and resource-based constraints; collectively, these findings suggest that infrastructure, personnel, and funding form an interrelated triad of foundational constraints that must be addressed concurrently for meaningful AI integration to occur in business education.

Awareness and Competence Levels of Educators

Table 3: Awareness and Competence Levels of Educators

Competence Level	Frequency	Percentage
Very competent	10	6.7%
Competent	28	18.7%
Somewhat competent	52	34.7%
Not competent	60	40.0%

The results show that only 6.7% of respondents rated themselves as very competent and a further 18.7% as competent in the use of AI tools, bringing the cumulative proportion of educators reporting at least a competent level of AI proficiency to just 25.4% of the sample, while the majority of respondents fell within the "somewhat competent" (34.7%) and "not competent" (40.0%) categories, jointly accounting for 74.7% of the sample; this overwhelming concentration in the lower competence bands directly reinforces the low levels of AI integration reported in Table 1, suggesting that limited educator competence is not merely incidental but a substantive explanatory factor underlying the low extent of AI adoption in teaching, assessment, and curriculum planning, and implying that infrastructural investment alone would be insufficient without a corresponding, deliberate investment in educator capacity building.

Perceived Impact of AI in Business Education Programmes

Table 4: Perceived Impact of AI in Business Education Programmes

Perceived Benefit	Mean Score
AI can personalize learning experiences	4.2
AI can improve administrative efficiency	4.0
AI can enhance data-driven decision-making	3.9

The results indicate strong agreement across all three perceived benefits of AI, with respondents rating its potential to personalize learning experiences highest (mean = 4.2), followed closely by its potential to improve administrative efficiency (mean = 4.0) and enhance data-driven decision-making (mean = 3.9); this consistently positive perception, standing in marked contrast to the low levels of actual AI integration reported in Table 1, suggests that the limited adoption observed in this study is not attributable to negative attitudes or scepticism toward AI among respondents, but rather to the structural, infrastructural, and capacity-related barriers identified in Tables 2 and 3, implying that institutional readiness, rather than staff willingness, remains the primary constraint on AI adoption in the business education programmes studied.

Statistical Test: Differences across Institution Types

Table 5a: Descriptive Statistics AI Integration Scores by Institution Type

Institution Type	n	Mean	SD
Universities	62	2.34	0.61
Polytechnics	51	2.02	0.58
Colleges of Education	37	1.91	0.65

Table 5b: One-Way ANOVA Summary

Source	Sum of Squares	df	Mean Square	F	p-value
Between Groups	3.482	2	1.741	4.76	.010
Within Groups	53.812	147	0.366		
Total	57.294	149			

Table 5c: Tukey HSD Post-Hoc Comparisons

Comparison	Mean Difference	p-value	Remark
Universities vs Colleges of Education	0.43	.008	Significant
Universities vs Polytechnics	0.32	.062	Not significant
Polytechnics vs Colleges of Education	0.11	.580	Not significant

A one-way Analysis of Variance (ANOVA) was conducted to compare mean AI integration scores across three categories of institutions — universities (M = 2.34, SD = 0.61, n = 62), polytechnics (M = 2.02, SD = 0.58, n = 51), and colleges of education (M = 1.91, SD = 0.65, n = 37) — and the analysis yielded a statistically significant difference between groups, F(2, 147) = 4.76, p = .010, with an eta-squared value of 0.061 indicating a small-to-moderate effect size, suggesting that institution type accounts for approximately 6.1% of the variance in AI integration scores. A Tukey HSD post-hoc test was subsequently conducted to identify precisely where these differences lay, and the results revealed that universities differed significantly from colleges of education (mean difference = 0.43, p = .008), while the difference between universities and polytechnics approached but did not reach conventional significance (mean difference = 0.32, p = .062), and no statistically significant difference was found between polytechnics and colleges of education (mean difference = 0.11, p = .58); taken together, these results indicate that universities exhibit significantly higher AI integration than colleges of education specifically, while the distinction between universities and polytechnics, though suggestive of a similar pattern, was not statistically robust, implying that institutional type is a relevant, though not uniformly decisive, factor shaping the extent of AI adoption in business education, most plausibly reflecting universities' comparatively greater infrastructural capacity, research orientation, and exposure to emerging technologies relative to their polytechnic and college of education counterparts.

Discussion of Findings

The findings of this study reveal critical insights into the state of Artificial Intelligence (AI) integration within business education programmes in Nigerian tertiary institutions. Despite the global shift toward AI-enhanced educational practices, the extent of AI adoption in Nigerian institutions remains notably low.

Low Level of AI Integration:

The study found that the use of AI in teaching delivery, student assessment, and curriculum planning is minimal. This confirms earlier research indicating that AI adoption in low-income countries remains far behind that of more advanced economies, with structural and infrastructural constraints continuing to condition both the opportunities and risks associated with adoption (Khan, Umer & Faruqe, 2024). This pattern is consistent with findings from Northern Nigerian higher education institutions, where a review of AI readiness similarly underscored the necessity of technological infrastructure, curriculum integration, and policy support to facilitate meaningful

adoption (Reuben & Kabilan, 2024). The limited integration of AI into the academic core of business education signals a significant gap between the potential of AI and its actual implementation in Nigeria, a gap that undermines the goal of equipping graduates with relevant, future-ready skills for the modern workforce.

Major Challenges Hindering AI Adoption:
The dominant challenges identified in this study — inadequate infrastructure, lack of trained personnel, poor funding, and resistance to change — mirror those consistently reported across the wider literature on AI adoption in resource-constrained educational settings. Landa-Blanco (2026) similarly identifies infrastructural deficits, including unreliable power supply and limited hardware and internet access, as a primary obstacle to the effective use of AI by teachers in low- and middle-income countries. These challenges are interrelated; for instance, inadequate funding contributes to both infrastructural shortfalls and insufficient training opportunities for staff, while the continued absence of robust institutional and governmental policy frameworks further complicates the path to effective AI integration (Ekanem & Emejulu, 2025; Ihejirika et al., 2023).

Educators' Awareness and Competence:
A significant proportion of educators in this study reported low competence in using AI tools, a finding that aligns closely with existing evidence on the state of digital literacy among Nigerian teaching staff. For instance, Sam-Kayode et al. (2023), in a study of secondary school science educators in Ibadan, similarly found only moderate ICT competency levels, with an average competency score of M = 3.14 (SD = 0.857), attributing this gap to inconsistent digital literacy training. This is further corroborated by Chigbundu and Oluwabiyi (2023), who identify a substantial digital skills gap within Nigerian higher education, particularly among older faculty members who may exhibit greater resistance to adopting new technologies, thereby underscoring the urgent need for comprehensive and sustained training programmes. The effectiveness of AI in education depends not only on the availability of technology but also on the human capacity to implement it meaningfully; Ayanwale et al. (2025) reinforce this point, emphasising that capturing teachers' attitudes, technology anxiety, and trust in AI tools is critical to achieving successful adoption and sustainable institutional change.

Positive Perception of AI's Potential:
Interestingly, while the actual use of AI tools among respondents in this study was low, respondents expressed a generally positive perception of AI's potential benefits. This finding is consistent with the observation by Varuvel Dennison et al. (2025) that educators in resource-constrained settings, across India, sub-Saharan Africa, and Latin America, often demonstrate considerable openness to digital and AI-enabled tools despite facing significant infrastructural barriers and top-down implementation models that limit meaningful integration. This suggests that resistance to AI adoption in the Nigerian context is not primarily rooted in negative attitudes, but rather in structural and capacity-related barriers. This finding presents a notable opportunity: with adequate infrastructure, training, and policy support, adoption in Nigerian business education could increase relatively quickly given the existing openness among staff and administrators.

Institutional Differences in AI Adoption:
The ANOVA results showed statistically significant differences in AI adoption between universities, polytechnics, and colleges of education, with universities recording marginally higher integration levels. This finding may be attributed to differences in funding levels, administrative capacity, and academic culture across institution types. This is broadly consistent with the work of Ukeje et al. (2024), who found that stakeholder-driven models supported by AI in South-East Nigerian universities more readily addressed governance challenges and promoted educational innovation, partly owing to greater institutional capacity for coordinated digital transformation. Universities often have comparatively greater access to research grants, international collaborations, and institutional autonomy that can foster innovation, including AI integration,

relative to polytechnics and colleges of education. However, the comparative lag observed in polytechnics and colleges of education in this study is a matter of concern, particularly given that these institutions play a critical role in vocational and practical business training within Nigeria's tertiary education system, and their slower AI uptake may consequently widen existing gaps in graduate readiness for an increasingly AI-integrated workforce.

The findings highlight a paradox in Nigerian business education: while there is strong recognition of AI's potential, actual implementation remains weak. Addressing this paradox requires deliberate investment in digital infrastructure, human capacity development, and policy reform. Without this, Nigerian tertiary institutions may continue to produce graduates unprepared for the realities of a technology-driven economy.

Implication of the Study

The findings of this study have significant implications for educational policy, curriculum development, institutional leadership, and national development in Nigeria. These implications cut across multiple levels, including academia, government, and industry stakeholders.

i. **Implications for Educational Policy Makers:** The study underscores the urgent need for a national framework or policy that supports the integration of Artificial Intelligence in business education. The lack of such a framework has contributed to inconsistent implementation across institutions. Policymakers must recognize AI as a critical tool for modernizing education and prioritize investments in AI-focused infrastructure, staff training, and digital resources.

ii. **ii. Implications for Curriculum Developers:** The current business education curriculum in many Nigerian tertiary institutions does not adequately reflect the demands of a digital economy. This study implies that there is a pressing need to revise business education curricula to incorporate AI-related content, such as data analytics, machine learning applications, and automation in business processes. This will ensure that graduates are not only theoretically sound but also technologically competent and job-market ready.

iii. **iii. Implications for Institutional Leadership:** Administrators in tertiary institutions must take proactive steps to champion the adoption of AI. The study implies that leadership plays a key role in shaping the institutional culture toward innovation. By fostering partnerships with tech companies, organizing AI training workshops for staff and allocating internal funding toward technology adoption, institutional leaders can set the pace for sustainable change.

iv. **iv. Implications for Business Educators:** The low competence level reported among educators points to a clear need for continuous professional development. Business educators must be empowered to transition from traditional teaching methods to AI-enhanced pedagogies. This study implies that without equipping educators with the necessary digital and AI literacy skills, any attempts to modernize business education will be ineffective.

v. Implications for National Development: Ultimately, the study implies that failing to integrate AI into business education risks producing graduates who are unprepared for the realities of a fast-evolving, technology-driven job market. This could deepen the unemployment crisis and limit Nigeria's global competitiveness. Therefore, addressing the challenges highlighted in this study is not just an educational necessity, it is a national imperative.

The Future of AI in Nigerian Business Education

Looking ahead, the integration of Artificial Intelligence into Nigerian business education holds transformative potential that goes beyond incremental improvements—it's poised to fundamentally reshape how business knowledge is acquired, applied, and evolved. The vision for AI in Nigerian tertiary institutions is one where technology acts as an empowering catalyst that bridges gaps in access, quality, and relevance of business education across the country. AI's long-term impact is expected to manifest in several key ways. First, **personalized learning**

experiences will become the norm, enabling each student to engage with business concepts at their own pace and style. This individualized approach promises to democratize education by catering to diverse learning needs and overcoming challenges posed by large class sizes and limited faculty resources (Luckin et al., 2016).

Second, AI-driven **skill development will align more closely with real-world business demands,** especially in areas like data analytics, digital entrepreneurship, and strategic decision-making. Nigerian graduates will be better prepared to navigate global markets, innovate, and contribute to economic growth in an increasingly AI-powered business environment (Nwazor & Godwin-Maduike, 2023). Moreover, AI will enhance **institutional decision-making**, enabling universities to optimize resource allocation, improve student retention, and design more effective curricula based on predictive analytics. This data-informed management could revolutionize how Nigerian institutions operate, making them more agile and responsive to both local and global educational trends (Eze & Okafor, 2022). However, realizing this vision requires a concerted effort: investment in infrastructure, commitment to faculty training, ethical governance frameworks, and a cultural shift embracing innovation. When these elements converge, AI will not just supplement business education—it will redefine it, positioning Nigeria as a leader in harnessing AI for educational excellence in Africa.

Conclusion

This study set out to examine the role of Artificial Intelligence (AI) in the contemporary development of business education in Nigerian tertiary institutions, with particular focus on its current level of integration, the challenges encountered, and the implications for educators, policymakers, and institutions. The findings reveal that while there is a growing awareness of AI's potential to transform business education, its actual adoption remains significantly low across most institutions. Critical barriers such as inadequate infrastructure, lack of trained personnel, poor funding, and the absence of clear policy direction continue to hinder progress. Moreover, many educators still lack the competence and confidence to effectively incorporate AI tools into teaching and learning processes, despite expressing a generally positive attitude toward AI-driven education. The study concludes that if Nigerian tertiary institutions are to keep pace with global educational trends and produce graduates equipped for the demands of a digital economy, deliberate and sustained efforts must be made to overcome these challenges. This includes revising curricula, investing in digital infrastructure, upskilling educators, and enacting supportive policies. In sum, AI holds immense promise for the modernization of business education in Nigeria; but realizing this promise requires a coordinated, strategic approach involving all stakeholders in the education sector.

Recommendations

Based on the findings and conclusions of this study, the following recommendations are proposed to facilitate the effective integration of Artificial Intelligence (AI) into business education in Nigerian tertiary institutions:

i. Curriculum Review and Modernization: Curriculum developers, in collaboration with regulatory bodies such as the National Universities Commission (NUC) and National Board for Technical Education (NBTE), should urgently revise business education curricula to include AI-related courses and practical components. Topics such as data analytics, AI in business decision-making, digital entrepreneurship, and automation tools should be incorporated to ensure relevance and competitiveness.

ii. Capacity Building for Educators: Business educators and administrative staff should undergo regular training and workshops on AI tools and emerging digital technologies. Institutions can partner with technology firms and international bodies to organize professional development programs that build both technical competence and pedagogical readiness for AI integration.

iii. Investment in Infrastructure: Federal and state governments, along with institutional management, must prioritize investment in digital infrastructure. Reliable internet access,

computer labs equipped with AI software and smart classroom technologies are foundational to any AI-driven educational reform.

iv. Development of Institutional AI Policies: Each tertiary institution should develop a clear policy framework that guides the ethical and strategic use of AI in teaching, assessment, and administration. These policies should address issues such as data privacy, bias in algorithms, and the responsible use of AI-generated content.

v. Encourage Collaborative Partnerships: Institutions should actively seek collaborations with tech companies, industry experts, and research bodies to stay updated on global trends in AI and secure access to resources, tools, and expertise. Such partnerships can also create internship and employment opportunities for students.

vi. Government and Stakeholder Support: The Federal Ministry of Education and relevant education commissions should provide grants and incentives for institutions that demonstrate a clear roadmap for integrating AI in education. Policymakers must also create an enabling environment through legislation that supports innovation and digital transformation in tertiary education.

vii. Awareness and Change Management: Institutional leaders should lead sensitization campaigns to address resistance to change among staff. By demonstrating the practical benefits of AI in education and engaging staff in the reform process, institutions can foster a more receptive and innovative culture.

Conflict of Interest

The author(s) declare that this research was conducted in the absence of any commercial, financial, or personal relationships that could be construed as a potential conflict of interest. No funding was received from any organization with a commercial or financial interest in the subject matter or outcomes of this study, and the findings, interpretations, and conclusions presented herein are solely those of the author(s).

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