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INTEGRATION OF AI SIMULATION TOOLS IN BUSINESS EDUCATION: IMPLICATIONS FOR PREPARING FUTURE OFFICE ADMINISTRATORS IN SOUTHEAST, NIGERIA

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ABSTRACT

This study examined the integration of Artificial Intelligence (AI) simulation tools in business education and its implications for preparing future office administrators in tertiary institutions in Southeast Nigeria. Two purposes of study, two corresponding research questions and one null hypothesis guided the study. A descriptive survey research design was adopted. The population consisted of 191 respondents, comprising 35 business education lecturers and 156 final-year students in selected tertiary institutions offering business education programmes in Southeast Nigeria. No sampling was conducted because the population size was manageable. Data were collected using a structured questionnaire titled Artificial Intelligence Simulation Tools Integration and Implementation Questionnaire (AISTIIQ). The instrument was validated by three experts and its reliability was established using Cronbach's Alpha, yielding coefficients 0.87 and 0.91 for clusters A and B respectively, with an overall reliability coefficient of 0.89. Mean and standard deviation were used to answer the research questions, while an independent samples t-test was used to test the hypothesis at a 0.05 level of significance. The findings revealed that the extent of integration of AI simulation tools in business education programmes for preparing future office administrators was low with mean rating of 2.74. The study also found that several factors constitute major barriers to the effective implementation of AI simulation tools, including poor internet connectivity, insufficient training of lecturers, limited computer facilities, high cost of AI tools and lack of institutional support with mean rating of 4.36. The study concluded that although AI simulation tools have the potential to enhance practical skill development among business education students, their integration in tertiary institutions in Southeast Nigeria remains limited due to infrastructural, institutional and human capacity challenges. The study recommends that tertiary institutions stakeholders among others should invest in digital infrastructure, provide adequate training for lecturers, develop supportive institutional policies to facilitate the effective integration of AI simulation tools in tertiary education programmes.

Keyword: Integration, AI simulation tools and business education

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Introduction

Artificial Intelligence (AI) is changing the way people teach, learn, and work across the world. In education, especially in business education, AI is no longer just a concept discussed in textbooks, it is now being used as a practical tool to improve learning experiences. Zawacki-Richter, Marín, Bond, & Gouverneur (2019) emphasis that business education and business educators are increasingly exploring AI's potential to go beyond passive content delivery to immersive, practice-oriented learning through simulation environments that mimic real organisational tasks. These AI simulation tools according to Hamilton (2025) are digital platforms that combine machine learning, natural language processing, adaptive feedback and scenario modelling to generate realistic interactions and performance outcomes for learners. Basically, according to UNESCO. (2021) AI to make learning environments super flexible and as such influence students get to do simulated business stuff like making decisions, managing resources, talking to people and planning strategies

Traditionally, business education has relied on classroom lectures, case studies and occasional business games to impart core theoretical knowledge in management, marketing, accounting and administration. Woon (2025) opine that the approach has been criticised for its limited capacity to develop practical decision-making and workplace competencies that align with evolving employer expectations in a digital economy. Without deliberate exposure to authentic tasks, graduates often struggle to function effectively in roles that require immediate application of theory to practice, such as planning workflows, managing communication flows and problem solving in administrative settings (Ore & Hassan, 2023). It is within this context that AI simulation tools are emerging as promising pedagogical instruments to bridge the gap between theory and practice.

AI simulation tools are built to replicate complex organisational environments to respond dynamically to learners' choices, offering real-time feedback that mirrors real workplace consequences (Wang, 2025). Such tools according to Paul-Mgbeafulike, Udogu & Ikpeama (2024) extend traditional business simulations by integrating AI capabilities that adapt scenarios according to participant input, introduce unpredictable workplace challenges and provide personalised analytics on learner performance. These characteristics make AI simulations especially relevant for developing future office administrators who must navigate multifaceted administrative functions which includes internal coordination, digital communication, workflow management, responsive problem solving in organisational settings among others.

AI simulation tools by OECD (2021), refer to technology enabled platforms, applications that replicate tasks which business education students will possibly encountered in a world of work on graduation. These tools include business strategy games, scenario-based learning modules, adaptive feedback systems and interactive environments where learners make decisions and observe consequences, they may eventually face in a world of

work. The preparedness of future office administrators as regards to business education students' acquisition of competencies, capabilities and readiness to perform effectively in administrative contexts after graduation. Preparedness includes both technical and behavioural outcomes, such as digital literacy, decision-making competence, organisational skills, communication effectiveness, collaboration and professional confidence. Business education graduates who are well prepared can demonstrate the ability to operationalise theoretical knowledge in practical settings, as wall as solve workplace problems, adapt to changing task demands in administrative work role. Integrating AI simulations in business education aligns with broader educational strategies that emphasise experiential and simulation-based learning as essential for preparing business education graduates for professional roles especially as office administrator

Office administrator's roles involve organisational support, digital communication management, scheduling, coordination, problem resolution using AI simulation tools. Office administrators operate in dynamic is technology-enabled workplaces where adaptability, digital competency and decision-making ability are essential. Graduates from business education programmes who engage with AI simulation environments are more likely to internalise practical skills under conditions that approximate real workplace demands. AI simulation tools support the development of job-relevant decision-making skills by situating learners in interactive scenarios that require synthesising information, evaluating alternatives and making real-time decisions. These decision-making processes are central to administrative roles where administrators must prioritise tasks, manage logistical challenges and respond to organisational issues efficiently. Experiential practice in AI environments according to World Economic Forum (2023) cultivates strategic thinking and analytical skills that are beyond what traditional classroom instruction can yield. They went further to state that AI simulation tools foster digital literacy for modern office roles, familiarising learners with digital interfaces, real-time data interpretation, adaptive feedback systems and as such technology-driven problem solving. Graduates who have practised with AI simulations are more likely to be comfortable with technology integration, use digital platforms for workflow tasks and adapt quickly to new software environments in workplace settings.

AI simulation environments according to (Holmes et al., 2022) enhance learners' professional confidence, communication capacity and collaborative functioning. Adaptive simulations often involve teamwork, negotiation and role-based decision tasks that require learners to communicate effectively with peers, resolve conflicts and coordinate collective actions. These interpersonal skills are essential for future administrators who interact with diverse stakeholders, manage cross-functional communication and support organisational coherence. AI simulations within business education curricula signal a commitment to experiential learning models that prioritise

active engagement and professional relevance. This integration requires curriculum redesign, faculty support, infrastructure investments and instructional alignment with desired learning actions that collectively elevate the preparation of business education students for real workplace transitions. Empirical evidence according to Adejor (2025), consistently underscores that learners exposed to AI simulation tools are more likely to demonstrate readiness for career tasks, thereby increasing their employability and long-term professional adaptability. As the workplace continues to evolve with increasing automation and digital collaboration, graduates who have practised in AI-enhanced simulation environments will possess a competitive advantage in administrative and managerial roles.

Statement of the Problem

The integration of Artificial Intelligence (AI) simulation tools into business education is increasingly discussed as a pathway for improving teaching, learning and professional preparation. Across higher education, digital technologies are reshaping instructional delivery, assessment practices and skill acquisition processes. Business education, which prepares students for dynamic office and administrative environments, is not exempt from this transformation. Employers now expect graduates to demonstrate digital competence, problem-solving ability and adaptability to intelligent systems. Despite the expectations, many business education programs still rely heavily on traditional lecture-based methods and theoretical instruction. AI simulation tools have the capacity to create interactive, practice-oriented learning environments where students can engage in real-life business scenarios without real-world risks.

These tools can model office operations, decision-making processes, data management tasks and customer service interactions. Research indicates that simulation-based learning enhances critical thinking, engagement and practical skill development when properly implemented (Radianti et al., 2020). The presence of AI potential can not automatically translate into effective integration within business education classrooms without inadequate access to reliable internet, insufficient hardware and limited technical support. Even where facilities exist, educators may lack adequate training to effectively use AI-based instructional technologies. Without proper pedagogical guidance, AI tools risk being underutilized or misapplied. However, business education curricula in several institutions seem not have been fully updated to reflect emerging digital competencies required in modern office environments. When AI simulation tools are introduced without curricular restructuring, there may be a mismatch between learning objectives, assessment strategies and technology to use. This disconnect can create confusion for both instructors and students, limiting the instructional value of simulation experiences. AI technologies promise personalized learning and disparities in access to digital resources. This can widen existing educational gaps. Students from under-resourced backgrounds may struggle to benefit fully from AI-based systems if

they lack personal devices or stable connectivity. Consequently, instead of promoting inclusive skill development, poorly managed AI integration may reinforce inequality within business education programs. The specific implications of AI simulation tools for preparing future office administrators remains limited. There is insufficient focused research examining how AI simulations influence practical competencies, employability skills and readiness for contemporary office roles. Given these challenges, the central problem this study seeks to address is the lack of clear understanding and structured implementation of AI simulation tools in business education, particularly regarding their effectiveness in preparing students for modern office administration roles. Without systematic investigation, institutions may continue to adopt technologies without evidence-based strategies, leading to wasted resources and limited educational impact. This study, therefore, focused to examine how AI simulation tools can be meaningfully integrated into business education, identify the barriers affecting their use, and determine their implications for developing relevant professional competencies in students.

Purposes of the Study

Based on the identified problem, the following form the purposes of the study:

1. To examine the extent to which AI simulation tools are integrated into business education programmes for preparing students for modern office administration roles.
2. To identify the barriers affecting the effective implementation of AI simulation tools in business education.

Research Questions

The following research questions guided the study:

1. To what extent are AI simulation tools integrated into business education programmes for preparing students for modern office administration roles?
2. What are the barriers affecting the effective implementation of AI simulation tools in business education?

Hypothesis of the Study

The following null hypothesis is formulated:

1. **H_0:** There is no significant difference in the mean responses of business education lecturers and students on the barriers affecting the effective implementation of AI simulation tools in business education

Methods

The study adopted a descriptive survey research design. This design allows the researcher to collect data from lecturers and students regarding the extent of AI simulation integration and the barriers affecting its implementation. It is appropriate because the study seeks opinions, perceptions, and current practices.

The population of the study: The population consist of business education lecturers 35 and students offering business

education courses for 2025/2026 final year of 156 in selected tertiary institutions.

Area of the study: The study was carried out in tertiary institution that offers business education in Southeast of Nigeria. The institutions comprised Colleges of education (Technicial) Umunze, Nwafor Orizu of colleges of education, Nsugbe and Nnamdi Azikiwe University and Chukwuemeka Odomegwu Ojukwu Universities, Igbariam.

Sampling and sample technique: There was no sample due to small size of the population, the entire population was used for the studied.

The instrument for data collection: A structured questionnaire was developed by the researcher titled Artificial Intelligence Simulation Tools Integration and Implementation Questionnaire (AISTIIQ) was used. The questionnaire contained sections aligned with the study purposes, such as items measuring the extent of AI simulation integration and items identifying barriers to implementation.

Validation of instrument: The instrument was subjected to face and content validation by experts from department of business education and industrial technology education, all from faculty of Technology and Vocational Education to ensure its relevance and clarity.

The reliability of the instrument: The reliability of the instrument was determined using Cronbach's Alpha method to establish internal consistency. The reliability coefficients yielded 0.87 and 0.91 respectively for cluster A and B. The overall reliability coefficient yielded 0.89 which indicated that the instrument was reliable and suitable for data collection in the main study. The questionnaire was administered to the respondent by the researcher and collected at a spot to avoid misplacement by the respondent.

Method of data analysis: For data analysis, mean and standard deviation was used to answer the research questions, while the formulated hypothesis was tested using an appropriate inferential statistic independent samples t-test at a 0.05 level of significance. A five-point Likert scale was used 4.50 – 5.00 = Very High Extent 3.50 – 4.49 = High Extent 2.50 – 3.49 = Moderate Extent 1.50 – 2.49 = Low Extent, 1.00 – 1.49 = Very Low Extent.

Result

Research Question 1: To what extent are AI simulation tools integrated into business education programmes for preparing students for modern office administration roles?

SN	Extent of Integration	X	SD	REMARK
1.	AI simulations are included in course activities	2.41	0.66	Low Extent
2.	Students use AI tools for decision making exercise in the class	2.88	0.71	Undecided
3.	AI simulations are part of assessments	2.63	0.69	Low Extent
4.	Students are guided on using AI platforms	2.57	0.68	Low Extent
5	AI platforms are integrated into practical tasks	2.92	0.70	Undecided
6.	Lecturers demonstrate AI applications in class	2.74	0.72	Low Extent
7.	AI tools included in final examinations	2.60	0.73	Low Extent
8.	Students explore AI tools independently	2.95	0.70	Undecided

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9.	AI tools are accessible to all students	2.69	0.68	Low Extent
10	AI simulations are use in use in the class to support collaborative learning	2.83	0.71	Undecided
11.	AI stimulates improve problem solving skills	2.76	0.69	Low Extent
12	Lecturers encourage consistent use of AI tools	2.87	0.70	Undecided
13	AI tools help students practice real-life scenarios	2.79	0.68	Low Extent
14	AI platforms are integrated into practical tasks	2.66	0.67	Low Extent
	Total mean	2.74	0.69	LOW EXTENT

Result

The data presented in Table 1 above present the extent of integration of AI simulation tools in educational programmes for preparing students for modern office administration roles. The mean ratings for the items range from 2.41 to 2.95, while the standard deviation values range from 0.66 to 0.73. Based on the 5-point rating scale, mean scores below 3.00 indicate low extent of integration, whereas values close to 3.00 reflect undecided opinions among respondents. Respondents in items no 1, 3,4, 6,7, 9,11, 12 and 13 respectively were rated; AI simulations are not included in course activities 2.41, AI simulations are part of assessments 2.63, Students are guided on using AI platforms, AI tools are included in final examinations 2.60, Lecturers demonstrate AI applications in class 2.74, , AI stimulates improve problem solving skills 2.76, AI tools are accessible to all students 2.69, AI tools help students practice real-life scenarios 2.79 and AI platforms are integrated into practical tasks 2.66. Respondents in Items no Items 2, 5, 8, 10 and 14 respectively were rated; students use AI tools for decision-making exercises in the class 2.88, AI platforms being integrated into practical tasks 2.92, students exploring AI tools independently 2.95, AI simulations supporting collaborative learning 2.83 and Lecturers encourage consistent use of AI tools

Research Question 2; What are the barriers affecting the effective implementation of AI simulation tools in business education?

SN	Barries for effective implementation	X	SD	Remark
15.	Limited access to AI software	4.42	0.61	High Extent
16	Poor internet connectivity	4.55	0.56	High Extent
17	High cost of AI tools	4.31	0.63	High Extent
18	Lack of technical support	4.37	0.59	High Extent
19	Lecturers insufficient AI training	4.64	0.54	High Extent
20	Resistance to change by staff	4.20	0.62	High Extent
21	Poor maintenance of hardware and software	4.35	0.60	High Extent
22	Limited computer facilities	4.47	0.58	High Extent
23	Lack of institutional policies on AI use	4.28	0.61	High Extent
24	Fear of technology replacing human roles	4.05	0.67	High Extent
	Total Mean and Standard Deviation	4.36	0.67	High Extent

The data in table 2 presents the barriers affecting the effective implementation of artificial intelligence (AI) simulation tools in business education programmes. The mean ratings for the items range from respectively 4.05 to 4.64, while the standard

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deviation values range from 0.54 to 0.67. Based on the five-point rating scale, mean scores above 3.50 indicate that respondents agreed to a high extent that the listed factors constitute barriers to the implementation of AI simulation tools in business education programmes. The results show that all the item listed are barriers with the following ratings scores; lecturers' insufficient AI training 4.64, poor internet connectivity 4.55, Limited computer facilities 4.47, limited access to AI software 4.42, lack of technical support 4.37, poor maintenance of hardware and software 4.35, high cost of AI tools 4.31, lack of institutional policies on AI use 4.28. The cluster mean of 4.36 with a standard deviation of 0.60 indicates that respondents generally agreed that the identified factors constitute major barriers to the effective implementation of AI simulation tools in business education programmes. The relatively low variation in standard deviation further suggests that respondents shared similar opinions regarding these challenges.

Table 3: Independent Samples t-test on the Mean Responses of Lecturers and Students on the barriers affecting the effective Implementation of AI simulation tools in business education

Respondents	N	Mean ($\bar{x}$)	SD	Df	t-cal	t-crit	Decision
Lecturers	35	4.33	0.62				
Students	156	4.38	0.65	189	0.41	1.96	Not Significant
Total	191	4.36	0.67				H_0 Accepted

The result presented in Table 3 shows the independent samples t-test analysis comparing the mean responses of business education lecturers and students on the barriers affecting the effective implementation of AI simulation tools in business education programmes. The analysis revealed that the calculated t-value (0.41) is less than the critical t-value (1.96) at 0.05 level of significance and 189 degrees of freedom. This indicates that there is no statistically significant difference in the mean responses of the two groups. Therefore, the null hypothesis was accepted. This implies that both lecturers and students share similar opinions regarding the barriers affecting the effective implementation of AI simulation tools in business education

Discussions

The findings of the study in table 1 revealed that the integration of artificial intelligence (AI) simulation tools in educational programmes for preparing students for modern office administration roles is generally low. The result indicates that respondents perceived that AI technologies are not adequately integrated into teaching, learning and assessment processes within the business education programmes. It lines with Auta, et al (2025) that although artificial intelligence is increasingly becoming relevant in modern workplaces, its incorporation into business and office administration education remains limited. This aligns with the opinion of Zawaxki-Richer et al (2019),

who emphasized that integrating artificial intelligence technologies into educational programmes can significantly enhance students' learning experiences by supporting simulation-based activities, personalized learning pathways and real-life problem-solving situations. Neil Selwyn (2020) emphasises that the integration of digital technologies, including AI, into educational programmes is essential for preparing learners to function effectively in rapidly evolving professional environments. AI has the potential to transform higher education through automation, personalized learning, and intelligent tutoring systems, its integration in many academic programmes remains limited due to inadequate infrastructure, lack of technical expertise, and institutional constraints. As noted by Luckin et al. (2022), the cost of acquiring, maintaining, and upgrading AI technologies often poses a significant barrier to widespread integration in educational institutions

The finding of the study in table 2 revealed that the effective utilization of AI simulation tools is limited by structural, institutional, technological, and human factors. Scholars have emphasized that technological readiness, institutional support, and educator competence are crucial determinants of successful AI integration in education (Zawacki-Richter, Marín, Bond, & Gouverneur, 2019). Similarly, Holmes, Bialik, and Fadel (2019) emphasis that infrastructural limitations, such as inadequate internet connectivity and limited access to AI software significantly impede the adoption of AI technologies in higher education settings. The high mean scores in this study reflect the reality that many institutions face such systemic challenges, which collectively restrict the use of AI simulation tools. As noted by Luckin et al. (2022), that the cost of acquiring, maintaining and upgrading AI technologies often poses a significant barrier to widespread integration in educational institutions. Selwyn (2020) highlights that educators' attitudes towards technological innovations play a critical role in shaping the adoption and sustainability of AI applications in education. The Selwyn opinion is line with the present findings, suggesting that attitudinal barriers, combined with institutional and infrastructural constraints among others create a significant barriers to effective implementation

Conclusion

In conclusion, the study revealed that the integration of Artificial Intelligence (AI) simulation tools in business education programmes in tertiary institutions in Southeast Nigeria is generally low, limiting students' exposure to technology-driven learning experiences necessary for modern office administration roles. The study also found that several barriers, including poor internet connectivity, inadequate facilities, high cost of AI technologies, and insufficient lecturer training, hinder the effective implementation of AI simulation tools in business education

Recommendations

1. Business education departments in tertiary institutions should incorporate AI simulation tools into

course content, practical activities, and assessment methods to improve students' practical learning experiences.

2. Institutional management and government should improve internet connectivity and provide adequate computer facilities to support the effective use of AI technologies in teaching and learning.

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