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LEVERAGING EMERGING TECHNOLOGIES IN BUSINESS EDUCATION FOR ENTREPREPRENEURIAL GROWTH AND SUSTAINABILITY IN SOUTH-EAST, NIGERIA

CHINYERE CHRISTY NWAGU(Ph.D)
Department of Business Education
Alvan Ikoku Federal Univertisy of Education, Owerri
F-mail - nwachristy330@yahoo.com
08035423317,

CHIMACHIZOBA FLORENCE
Department of Business Education
Alvan Ikoku Federal University of Education, Owerri
E-mail - chimafloxy2@gmail.com
07047134236

&

IWU, BLESSING KELECHI
Department of Business Education
Alvan Ikoku Federal University of Education, Owerri
E-mail - bkogazie@gmail.com
09024148977

Abstract

This study examined business education in the era of emerging technologies: Implications for entrepreneurship development and the sustainable economic future of South-East Nigeria. Two research questions and two null hypotheses guided the study. The study adopted a descriptive survey research design. The population comprised 142 business education lecturers in public universities running business education programme. Since the population was manageable, a census sampling technique was adopted. Data were collected using a structured questionnaire titled Business Education and Emerging Technologies for Entrepreneurship Development and Sustainable Economic Future Questionnaire (BEETEDSEFQ), which contained 16 items in two clusters. The instrument was validated by three experts and tested for reliability using Cronbach's alpha, yielding coefficients of 0.87 and 0.81 for clusters B1 and B2, with an overall reliability index of 0.84. Out of 142 copies administered, 134 (95%) were retrieved and used for analysis. Mean, standard deviation and One-Way Analysis of Variance (ANOVA) were used for data analysis. Findings revealed that respondents disagreed that emerging technologies are adequately integrated into Business Education programmes for entrepreneurship development in South-East Nigeria. However, respondents agreed that emerging technologies contribute significantly to the development of entrepreneurial competencies among business education students. The study further showed that there was no significant difference in the mean ratings of lecturers based on years of teaching experience regarding both the integration of emerging technologies and entrepreneurial competencies development. The study concluded that although emerging technologies enhance entrepreneurial competency development, their integration into Business Education programmes remains inadequate in South-East Nigeria. It was recommended that governments should provide adequate funding and digital infrastructure, while curriculum planners and the National Universities Commission should review and update Business Education curricula to incorporate emerging technologies and digital entrepreneurial competencies for sustainable economic development.

Keywords: *Business Education, emerging technologies, entrepreneurship development, entrepreneurial competencies, sustainable economic future.*

Introduction

In recent years, the global educational landscape has witnessed a significant transformation driven by rapid advancements in emerging technologies. These technologies include Artificial Intelligence (AI), cloud computing, Internet of Things (IoT), big data analytics, blockchain, virtual reality (VR), and financial technologies (FinTech). These innovations have reshaped teaching, learning and entrepreneurial practices across disciplines.

In view of this, education systems across the globe are compelled to move beyond traditional teaching methods toward technology-enhanced teaching and learning environments that promote innovation, creativity, and the development of digital competencies required in the 21st century economy (UNESCO, 2023).

In support of this view, Zou et al. (2025) asserted that the integration of emerging technologies has become essential in preparing students to function effectively in a rapidly evolving digital world. Emerging technologies have also expanded opportunities for personalized and flexible learning experiences, enabling students to learn at their own pace and access diverse learning resources tailored to their needs.

In addition, Zhao (2024) contended that emerging technologies support innovative teaching strategies such as flipped classrooms and blended learning which have been shown to improve students' engagement and learning experiences. Similarly, Brooks et al. (2023) noted that digital literacy has become a fundamental skill in university education, as students are expected to critically evaluate information, collaborate in digital environments, and produce digital content.

Consequently, Ghosh and Ravichandran (2024) posited that emerging technologies have become central to contemporary university education reforms, particularly in Vocational and Technical Education, where practical skills are essential for national development.

Within this context, Business education occupies a critical position in preparing youths for employment, entrepreneurship and self-reliance. It is a key component of Technical and Vocational Education and Training (TVET) that combines general education with the acquisition of skills and competencies required for various occupations (Federal Government of Nigeria (FGN), 2013).

Similarly, Enang (2022) described Business Education as a programme offered in universities and colleges of education in Nigeria that equips students with the knowledge, values, and skills needed for effective participation in the world of work. In view of the demands of the 21st century labour market, there is a growing need for the integration of emerging technologies into Business Education teaching and learning processes to enhance students' preparedness for work and entrepreneurship. Business Education is expected to produce self-reliant graduates who can function effectively in a technology-driven economy. It achieves this by integrating vocational knowledge with practical and digital skills that enable students to establish and manage enterprises.

According to Obi and Akudolu (2025), business education programmes in Nigeria are increasingly expected to incorporate emerging technologies to enhance students' entrepreneurial competencies and digital readiness. Similarly, Enang (2023) emphasized that Business Education graduates must possess digital entrepreneurial competencies to thrive in the modern labour market. In a digital economy, Business Education is therefore positioned not only to prepare graduates for employment but also to empower them as job creators through technology-enabled entrepreneurship. The integration of emerging technologies enhances experiential learning, innovation, and business development skills, thereby aligning graduates with global economic demands (Brooks et al., 2023; Ghosh & Ravichandran, 2024).

Additionally, emerging technologies are reshaping entrepreneurship education by providing students with practical exposure to real-world business environments. Through

digital simulations, online business platforms, AI-driven analytics, and virtual learning environments, students can develop entrepreneurial competencies such as opportunity recognition, innovation, risk-taking, and decision-making. Edenkwo and Nwaoburu (2025) emphasized that immersive learning technologies significantly enhance entrepreneurial mindsets and prepare students for the realities of modern business operations.

Likewise, Agbonaye and Muhammed (2025) found that AI-driven technologies improve entrepreneurial skill acquisition by enhancing students' creativity, digital literacy, and problem-solving abilities. Entrepreneurship is widely recognized as a strategic tool for job creation, innovation, and economic growth. It drives economic development by enabling individuals to identify opportunities, mobilize resources, and create value through new or improved products and services. In both developed and developing economies, entrepreneurship plays a critical role in reducing unemployment, stimulating innovation, and enhancing competitiveness in the global market.

In the Nigerian context, entrepreneurship is particularly important due to the persistent challenge of graduate unemployment and limited formal job opportunities, making self-employment a viable alternative for sustainable livelihoods (David & Adedeji, 2024; Ogundele, 2020).

In addition, entrepreneurship education equips youths with the knowledge, skills and attitudes required to initiate and manage business ventures successfully. It fosters creativity, risk-taking, problem-solving, and innovation skills essential for adapting to changing economic conditions (Enang, 2022). Entrepreneurship development remains a key strategy for promoting economic growth and reducing unemployment in Nigeria. The Nigerian economy, particularly in the South-East region, is characterized by high levels of graduate unemployment and limited job opportunities in the formal sector (Osita, Oraegbunam & Onuzulike-Chukwuemeka, 2022). As a result, entrepreneurship education has become an essential tool for empowering youths with self-employment skills.

However, Wahab and Akintade (2025) argued that the effectiveness of entrepreneurship education depends on the extent to which modern technologies are integrated into teaching and learning processes. However, Osiesi et al. (2024) observed that although lecturers in Nigerian universities are aware of digital tools, their actual utilization for entrepreneurial development remains low, limiting their readiness for the digital economy.

Despite the acknowledged importance of emerging technologies in Business Education and entrepreneurship development, there appear to be concerns that their integration into university programmes in South-East Nigeria remains inadequate. Many universities in Nigerian still face challenges such as inadequate ICT infrastructure, insufficient funding, limited access to digital tools, and lack of adequate training for lecturers (Mada, 2025; Onasanya & Fadeyibi, 2025).

According to Obi and Akudolu (2025), these challenges significantly hinder the effective implementation of emerging technologies in teaching Business Education courses. Furthermore, the gap between curriculum content and industry demands raises concerns about the preparedness of Business Education graduates for the evolving digital economy. Without adequate integration of emerging technologies, graduates may lack essential entrepreneurial competencies required to innovate, compete, and succeed in modern business environments. This situation poses a serious threat to sustainable economic development, particularly in regions like South-East Nigeria where entrepreneurship is a major driver of economic survival and growth.

In this study, years of teaching experience (1–5 years, 6–10 years, and above 10 years) represent an important demographic variable that could determine whether business education lecturers' perceptions differ in relation to the integration of emerging technologies and the entrepreneurial competencies developed in Business Education programmes. Teaching experience is often assumed to influence educators' exposure, pedagogical competence, and familiarity with instructional innovations, including digital tools. For

instance, more experienced lecturers may have deeper curriculum knowledge and classroom management skills, while less experienced lecturers may be more adaptable to new technologies due to their recent exposure to digital learning environments. It is against this background that this study examined business education in the era of emerging technologies and its implications for entrepreneurship development and the sustainable economic future of South-East Nigeria.

Statement of the Problem

Business education is expected to equip students with relevant knowledge, skills, and competencies needed for entrepreneurship development and sustainable economic participation in the changing digital economy. In the era of emerging technologies such as AI, cloud computing, big data analytics, and FinTech, business education programme in Nigerian universities are increasingly expected to integrate these technological innovations to enhance teaching, learning, and entrepreneurial skill acquisition.

However, there are still growing concerns among the researcher, educators, curriculum experts, and other educational stakeholders that the extent to which these emerging technologies are integrated into university Business Education programme in Nigeria particularly South-East region remains inadequate. Despite the recognized potential of emerging technologies to improve entrepreneurial competencies, promote innovation, and prepare business education students for self-reliance upon graduation, business education programme in many universities in South-East, Nigeria appears to rely heavily on traditional teaching methods. This situation raises concern about whether business education students are truly being equipped with the digital entrepreneurial competencies required to effectively fit into today's and future digital workplaces. The researcher is particularly worried that the gap between classroom instruction and real-world digital entrepreneurial practices may continue to widen if urgent action is not taken.

In addition, if this situation is not addressed, graduates of business education may continue to experience low employability, poor entrepreneurial readiness, and limited capacity to create or manage digital enterprises.

Consequently, this could contribute to increasing graduate unemployment and reduced their contribution to sustainable economic development in South-East Nigeria. It is against this backdrop that this study investigated business education in the era of emerging technologies and its implications for entrepreneurship development and the sustainable economic future of South-East Nigeria.

Purpose of the Study

The main purpose of this study was to examine the implications of emerging technologies in business education for entrepreneurship development and the sustainable economic future of South-East Nigeria. Specifically, the study determined;

1. the emerging technologies integrated into universities' business education programme for entrepreneurship development in South-East, Nigeria.
2. the entrepreneurial competencies developed through the integration of emerging technologies into universities' business education programme in South-East, Nigeria.

Research Questions

The following research questions guided the study;

1. What emerging technologies are integrated into universities' business education programme for entrepreneurship development in South-East Nigeria?
2. What entrepreneurial competencies are developed through the integration of emerging technologies to universities business education programme in South-East Nigeria?

Research Hypotheses

The following null hypotheses were tested at 0.05 level of significance;

1. Business education lecturers do not differ significantly in their mean ratings on the emerging technologies integrated into universities' business education programme for entrepreneurship development in South-East, Nigeria based on years of teaching experience (1-5, 6-10, above 10 years).
2. There is no significant difference in the mean ratings of business education lecturers on the entrepreneurial competencies developed through the integration of emerging technologies into universities' business education programme in South-East, Nigeria based on years of teaching experience (1-5, 6-10, above 10 years).

Method

This study adopted a descriptive survey research design. It was conducted in South-East, Nigeria. The population of the study consisted of 142 business education lecturers in the 9 public universities running Business Education programme in South East Nigeria. The population of the study was manageable and accessible to the researcher; thus census sampling procedure was employed. The instrument for data collection was a self-developed structured questionnaire titled "Business Education and Emerging Technologies for Entrepreneurship Development and Sustainable Economic Future Questionnaire (BEETEDSEFQ)". The instrument contained two sections: A and B. Section A elicit demographic information of the respondents such as years of teaching experience while section B contained 16 items in two clusters; B1 and B2 covering the two research questions. The instrument was structured on a four points rating scale of Strongly Agree (SA) - 4, Agree (A) - 3, Disagree (D) – 2 and Strongly Disagree (SD) - 1.

The face and content validity of the instrument was ascertained using the judgments of three experts, two from Business Education and one from Psychology of Education. The reliability of the instrument was established through a trial-test method, and data obtained were calculated using Cronbach's alpha, which yielded a reliability coefficients of 0.87 and 0.81 for clusters B1 and B2, with an overall coefficient of 0.84 obtained. The questionnaire was administered by the researcher and six research assistants who were adequately briefed on the procedures for administration and retrieval.

Out of 142 copies of the questionnaire distributed, 134 representing 95% were retrieved and found usable for data analysis. Data collected were analyzed using mean, standard deviation, and One-Way Analysis of Variance (ANOVA). Mean and standard deviation were used to answer the research questions. The null hypotheses were tested using ANOVA at 0.05 level of significance with SPSS Version 27. A null hypothesis was accepted where the p-value is equal to or greater than 0.05 and rejected where the p-value is less than 0.05 level of significance.

Results and Discussion of Findings

Presentation of Research Questions and Null Hypotheses

Research Question 1: What emerging technologies are integrated into universities' business education programme for entrepreneurship development in South-East Nigeria?

Table 1: Respondents' Mean and Standard Deviation on Emerging Technologies are Integrated into Universities' Business Education Programme for Entrepreneurship Development (N = 134)

S/N	Emerging Technologies in Business Education	$\bar{X}$	SD	Decision
1	Artificial Intelligence tools are integrated into Business Education programme for entrepreneurial learning activities.	2.01	0.64	Disagree
2	Cloud computing technologies are integrated into Business Education programme for entrepreneurial skill development.	2.18	0.67	Disagree
3	Digital marketing technologies are integrated into Business Education programmes for entrepreneurship	1.67	0.68	Disagree

	training.			
4	E-learning platforms and virtual learning systems are integrated into Business Education programme.	2.51	0.70	Agree
5	Big data analytics technologies are integrated into Business Education programme for entrepreneurial decision-making skills.	1.27	0.71	Strongly Disagree
6	Internet of Things (IoT) technologies are integrated into Business Education programme for entrepreneurship education.	2.55	0.58	Agree
7	Virtual Reality (VR) and Augmented Reality (AR) technologies are integrated into Business Education programs for practical entrepreneurial experiences.	2.71	0.66	Agree
8	Financial technology (FinTech) tools are integrated into Business Education programs for entrepreneurship development.	1.39	0.67	Strongly Disagree
	Cluster Mean/SD	**2.04**	**0.66**	**Disagree**

Source: Field work 2026

Table 1 data show the cluster mean of 2.04 with a cluster standard deviation of 0.66 indicates that respondents disagreed that emerging technologies are adequately integrated into universities Business Education programme for entrepreneurship development in South-East Nigeria. The item-by-item analysis reveals that respondents generally disagreed that most emerging technologies are integrated into Business Education programmes for entrepreneurship development in South-East Nigeria, with low mean scores recorded for Artificial Intelligence ($\bar{X}$ = 2.01), cloud computing ($\bar{X}$ = 2.18), digital marketing technologies ($\bar{X}$ = 1.67), big data analytics ($\bar{X}$ = 1.27), and FinTech tools ($\bar{X}$ = 1.39), indicating poor integration of these key technologies; however, respondents agreed that e-learning platforms ($\bar{X}$ = 2.51), Internet of Things (IoT) ($\bar{X}$ = 2.55), and Virtual Reality/Augmented Reality (VR/AR) ($\bar{X}$ = 2.71) are moderately integrated, The standard deviation for all the items is within the same range, indicating that the respondents are not far apart in their mean ratings.

Research Question 2: What entrepreneurial competencies are developed through the integration of emerging technologies to universities' business education programme in South-East Nigeria?

Table 2: Respondents' Mean and Standard Deviation on Entrepreneurial Competencies through the Integration of Emerging Technologies to Universities Business Education Programme (N = 134)

S/N	Entrepreneurial Competencies from Emerging Technologies	$\bar{X}$	SD	Decision
9	Integration of emerging technologies develops digital literacy competencies among Business Education students	2.73	0.68	Agree
10	Integration of emerging technologies develops problem-solving competencies among Business Education students	2.56	0.65	Agree
11	Integration of emerging technologies develops innovative and creative thinking competencies among Business Education students	2.64	0.72	Agree
12	Integration of emerging technologies develops communication competencies required for entrepreneurial activities	2.49	0.67	Disagree
13	Integration of emerging technologies develops decision-making competencies among Business Education students	2.82	0.61	Agree
14	Integration of emerging technologies develops leadership and team management competencies among Business Education students	2.31	0.69	Disagree
15	Integration of emerging technologies develops opportunity			

	identification and business planning competencies among Business Education students	2.61	0.66	Agree
16	Integration of emerging technologies develops adaptability and entrepreneurial resilience competencies among Business Education students	2.43	0.64	Disagree
	Cluster Mean/SD	**2.57**	**0.67**	**Agree**

Source: Field work 2026

Table 2 data show that the respondents agreed that the integration of emerging technologies develops digital literacy competencies ($\bar{X}$ = 2.73), problem-solving competencies ($\bar{X}$ = 2.56), innovative and creative thinking competencies ($\bar{X}$ = 2.64), decision-making competencies (M = 2.82), and opportunity identification and business planning competencies ($\bar{X}$ = 2.61) among Business Education students.

The respondents disagreed that emerging technologies adequately develop communication competencies ($\bar{X}$ = 2.49), leadership and team management competencies ($\bar{X}$ = 2.31), and adaptability and entrepreneurial resilience competencies ($\bar{X}$ = 2.43). The overall cluster mean of 2.57 (SD = 0.67) indicates agreement that emerging technologies contribute to the development of entrepreneurial competencies among university Business Education students in South-East Nigeria.

Hypothesis 1: Business education lecturers do not differ significantly in their mean ratings on the emerging technologies integrated into universities' business education programme for entrepreneurship development in South-East, Nigeria based on years of teaching experience (1-5, 6-10, above 10 years).

Table 3: One-Way ANOVA on Mean Ratings of Business Education Lecturers Based on Teaching Experience on Emerging Technologies Integrated into Universities Business Education Programmes for Entrepreneurship Development

Source of Variation	Sum of Squares (SS)	df	Mean Square (MS)	F-cal	Sig.	Decision
Between Groups	1.92	2	0.96	2.18	0.117	Not Significant
Within Groups	57.67	131	0.44			
Total	59.59	133				

Table 3 data show that there is no significant difference in the mean ratings of Business Education lecturers on emerging technologies integrated into university Business Education programmes for entrepreneurship development in South-East Nigeria based on years of teaching experience ($F(2,131) = 2.18$, $p > 0.05$). Since the p-value is greater than the alpha level, the null hypothesis is therefore accepted.

Hypothesis 2: There is no significant difference in the mean ratings of business education lecturers on the entrepreneurial competencies developed through the integration of emerging technologies into university business education programme in South-East, Nigeria based on years of teaching experience 1-5, 6-10, above 10 years).

Table 4: One-Way ANOVA on Mean Ratings of Business Education Lecturers Based on Teaching Experience on Entrepreneurial Competencies Developed through Integration of Emerging Technologies into Universities Business Education Programmes

Source of Variation	Sum of Squares (SS)	df	Mean Square (MS)	F-cal	Sig.	Decision
Between Groups	2.64	2	1.32	2.94	0.056	Not Significant
Within Groups	58.81	131	0.45			
Total	61.45	133				

The One-Way ANOVA result revealed that there is no significant difference in the mean ratings of business education lecturers on the entrepreneurial competencies developed through the integration of emerging technologies into university Business Education

programmes in South-East Nigeria based on years of teaching experience ($F(2,131) = 2.94$, $p > 0.05$). Since the p-value is greater than the alpha level, the null hypothesis is therefore accepted

Discussion of Findings

The findings of the study revealed that respondents disagreed that emerging technologies are adequately integrated into university Business Education programmes for entrepreneurship development in South-East Nigeria. The low level of integration suggests continued reliance on conventional teaching methods, which may limit students' acquisition of digital and entrepreneurial competencies needed in the modern economy. In support of this finding, Asuku and Asuku (2026) and Mbah, Eze and Aduhueke (2024) found that digital technologies were utilized to a low extent in Business Education teaching and learning in universities, while Agbonaye and Muhammed (2025) and Enang (2024) reported low integration of digital technologies into Business Education programmes in Nigeria. The findings also revealed that there was no significant difference in the mean ratings of Business Education lecturers on emerging technologies integrated into university Business Education programmes for entrepreneurship development in South-East Nigeria based on years of teaching experience. The finding is consistent with that of Nwokike and Onochie-Ogene (2023) which revealed no significant difference in the mean ratings of Business Educators on the integration of emerging technologies in teaching. Obi and Akudolu (2025) reported similarities in respondents' perceptions concerning technology integration.

Findings of the study revealed that respondents agreed that emerging technologies contribute to the development of entrepreneurial competencies among university Business Education students in South-East Nigeria. This finding concurs with that of Osiesi et al. (2024) which found that students exposed to digital technologies demonstrated improved entrepreneurial knowledge and digital competencies necessary for entrepreneurial development.

Similarly, Edenkwo and Nwaoburu (2025 reported that immersive learning technologies and emerging digital tools in Business Education enhanced entrepreneurial mindsets and improved students' innovative and critical-thinking competencies. Egajivwie and Omorojie (2025) in support disclosed that digital entrepreneurial skill training positively influenced the employability and entrepreneurial competencies of Business Education students in universities. Findings of the study also revealed that there was no significant difference in the mean ratings of business education lecturers on the entrepreneurial competencies developed through the integration of emerging technologies into university business education programmes in South-East Nigeria based on years of teaching experience. This means that business education lecturers regardless of years of teaching experience had similar perceptions regarding the entrepreneurial competencies developed through emerging technologies. This finding could be attributed to the increasing awareness of the importance of emerging technologies in educational practices and entrepreneurship development.

Conclusion

Based on the findings of the study, it was concluded that although emerging technologies are perceived to contribute significantly to the development of entrepreneurial competencies among universities' Business Education students in South-East Nigeria, their integration into Business Education programmes for entrepreneurship development remains inadequate.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. Federal and State governments in Nigeria should provide adequate digital technologies and funding to support the integration of emerging technologies into business education programmes.

2. Curriculum planners and National University Commission (NUC) should review and update business education curriculum to incorporate emerging technologies and digital entrepreneurial competencies required for entrepreneurship development and sustainable economic growth.
3. Business education lecturers in Nigerian universities should adopt technology-enhanced teaching strategies and digital learning modes to enhance students' acquisition of entrepreneurial competencies for self-reliance.
4. Administrators of universities in Nigeria should organize regular in-service training programmes for business education lecturers to up-date their digital competencies in the use of emerging technologies for entrepreneurship development.

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