

Safe Supportive-Learning Environment and Business Education Students' Learning Outcomes: Implications for Nigerian Tertiary Institutions

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Abstract: The evolving demands of the 21st-century labour market require business education graduates to possess digital competence, entrepreneurial orientation, and self-directed learning skills. Nigerian tertiary institutions face structural and policy challenges in cultivating these competencies, particularly within business education programs. This study examines the role of a Safe Supportive-Learning Environment (SSLE) which is defined as a holistic ecosystem integrating physical and digital infrastructure, cyber-security, digital literacy, psychological safety, and supportive institutional policies in enhancing students' learning outcomes. Drawing on the self-regulated learning framework, psychological safety theory, national e-learning guidelines, and recent empirical studies from Nigeria, the study investigates how SSLE dimensions such as psychological safety, digital accessibility, instructional clarity, and self-regulated learning support impacts on academic performance, engagement, digital skills, and employability. Using a descriptive survey design, data were collected from 300 business education students across three Nigerian tertiary institutions. Descriptive statistics revealed that students perceived high psychological safety and instructional clarity, alongside moderate-high digital accessibility and self-regulated learning support. Inferential analyses showed a strong, positive correlation ($r = 0.68$, $p < 0.01$) between SSLE and learning outcomes, with multiple regression indicating that the four SSLE dimensions collectively explained 62% of the variance in learning outcomes, and psychological safety emerged as the strongest predictor. The findings underscore the importance of fostering safe, supportive, and technologically enabled learning environments to optimize student performance and engagement. The paper offers actionable institutional and policy implications, including: aligning e-learning investments with NUC 2023 guidelines, strategic ICT infrastructure development, embedding digital safety and literacy in curricula, continuous lecturer professional development, and equitable student support mechanisms. The study concludes with recommendations for Nigerian tertiary institutions to design context-sensitive SSLEs that strengthen self-regulated learning, digital competence, and 21st-century employability, while highlighting directions for future empirical research.

Keywords: safe self-learning environment, self-regulated learning, psychological safety, blended learning, digital skills

Introduction

In the 21st century, business education is expected to go beyond the transmission of technical knowledge; it must cultivate graduates who are independent, ethically responsible, digitally fluent, and capable of navigating increasingly complex professional environments. As a teacher-scholar or researcher, you will appreciate that student autonomy and safety within the learning space have become central to achieving these outcomes. Recent evidence shows that a safe self-learning environment is characterized by psychological safety, dependable digital access, clear pedagogical structure, and opportunities for self-regulated engagement which significantly enhances students' motivation, participation, and overall academic performance in higher education (Getenet, Cattle, Redmond & Albion2024; El-Sabagh, 2021).

Nigeria's tertiary education system stands at a particularly critical moment. The National Universities Commission (NUC) continues to emphasize e-learning readiness and blended delivery as core pillars of university education, especially in the aftermath of COVID-19 disruptions. These developments underscore that digital and self-directed learning are no longer supplementary options but essential institutional strategies. However, effective implementation depends on the creation of learning environments that are safe, inclusive, and supportive of autonomous learner behaviour. Studies conducted in Nigerian universities during and after the pandemic highlight both the strengths of online and self-guided learning modalities and the persistent challenges such as infrastructural deficits, inconsistent digital access, lecturer preparedness, and limited student support,

that influence learning outcomes (Ebekozen, Hafez, Aigbavboa, Samsurijan, Al-Hasan & Nwaole 2024; Anonymous, 2025).

Globally, research continues to affirm that adaptive, personalized, and AI-supported learning systems can significantly improve academic outcomes, engagement, and student satisfaction when embedded within well-structured self-learning environments (Murillo Noriega, 2025; Abouelenein, Selim & Aldosemani, 2025). This trend is highly relevant for business education in Nigeria, where practical learning, reflective practice, and digital competence are increasingly essential. For Nigerian tertiary institutions, the evidence points to a dual mandate: strengthening institutional capacity and policy alignment with national standards while intentionally designing self-learning supports that enhance self-regulated learning, promote equitable access, and align assessment with 21st-century competencies.

Against this backdrop, this paper investigates how safe self-learning environments shape the learning outcomes of business education students in Nigeria. It identifies the structural and pedagogical barriers that hinder safe, autonomous learning as well as the institutional practices that enable it. Ultimately, the study aims to contribute both scholarly insight and practical guidance; offering Nigerian universities context-sensitive, evidence-informed strategies to enhance student wellbeing and support the development of the professional competencies demanded by contemporary workplaces.

Business education must evolve from traditional, teacher-centered delivery toward models that cultivate autonomy, adaptability, and digital proficiency. A safe self-learning environment (SSLE) supports learners to pursue inquiry-driven study, experiment with digital tools, and practice workplace tasks while minimizing physical, digital, academic, and psychological barriers. Nigerian universities can accelerate graduate readiness for contemporary workplaces by intentionally designing SSLEs that couple infrastructure investments with pedagogical reform and policy alignment. This paper develops a conceptual framework linking SSLE components to measurable student learning outcomes and offers practical institutional and policy steps for Nigerian tertiary institutions.

The 21st-century learning landscape is shaped by rapid digital transformation, knowledge automation, and the growing need for independent learning capabilities. A Safe Self-Learning Environment (SSLE) encompasses the physical, digital, psychological, and academic conditions that support learners to engage in autonomous and technology-supported learning without fear, barriers, or risks. Studies increasingly show that higher education must adopt SSLE-centered approaches to improve learning outcomes, particularly in developing economies like Nigeria where infrastructural and pedagogical deficits persist. A SSLE integrates four interdependent domains:

i. Physical infrastructure: functional classrooms, ICT labs, reliable campus networks, and power alternatives to reduce downtime. Digital transformation in education requires robust ICT infrastructure, including functional e-learning platforms, stable internet connectivity, digital libraries, and reliable power supply. UNESCO (2023) identifies digital readiness as a prerequisite for quality higher education, emphasizing equitable access and the need for policies that protect learners online. In Nigeria, inadequate infrastructure remains a leading constraint to effective digital learning (Ilori & Oduroye, 2025), with unreliable networks, limited broadband capacity, and insufficient digital devices affecting students' ability to learn independently.

ii. Cyber-security and Digital Safety: secure platforms, data protection, reliable broadband, and access to authentic digital resources. As institutions integrate digital tools, cyber risks such as phishing, data breaches, and exposure to misinformation have become prominent threats. Safe digital learning environments must incorporate cyber-security policies, digital literacy training, and ethical use guidelines. Students lacking digital safety knowledge may experience anxiety, confusion, and misuse of digital platforms, impairing learning outcomes (UNESCO, 2023). Incorporating digital ethics and cyber-hygiene modules into business education curricula can mitigate these risks.

iii. Psychological Safety in Learning:

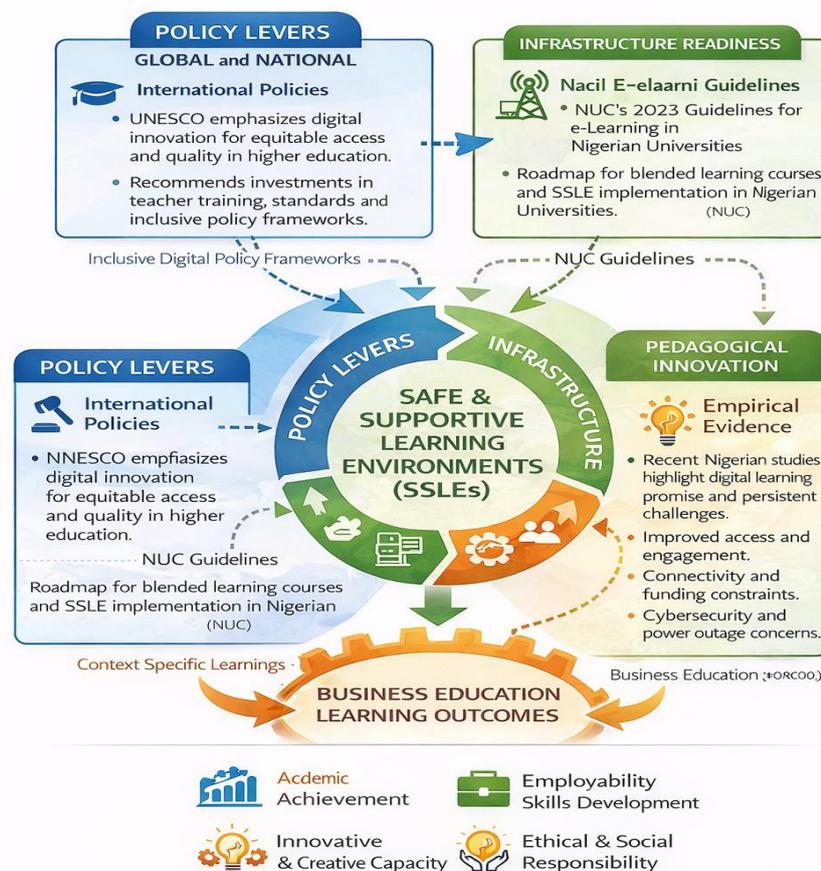
Psychological and Academic Safety: inclusive pedagogy, formative feedback, and assessment practices that reward experimentation.

Psychological safety plays a fundamental role in students' motivation and willingness to experiment, ask questions, and engage in group tasks. Edmondson's (1999) seminal work shows that higher psychological safety correlates with deeper learning, reduced fear of failure, and increased creativity. In Nigerian classrooms, often hierarchical, teacher-dominated, and large—the absence of psychological safety limits student participation and independent learning. The transition to blended and self-directed learning environments requires pedagogical reforms that reduce intimidation and enhance student autonomy.

Institutional Policy & Capacity: e-learning governance, lecturer CPD, student support, and equity-focused resource allocation.

iv. Self-Regulated Learning (SRL) Processes: According to Zimmerman’s (2002) SRL framework explains how students take ownership of their learning through goal-setting, self-monitoring, strategic planning, and reflection. In a self-learning environment, SRL skills become essential for navigating online resources, managing time, and evaluating progress. Research shows that SRL predicts academic achievement, persistence, and adaptability in blended formats (Broadbent & Fuller-Tyszkiewicz, 2018). However, many Nigerian students have limited exposure to SRL-based instruction, making formal integration into business education necessary. When these domains interact effectively, students are more able to self-regulate their learning, practice digital tasks safely, and translate classroom learning into employable skills.

Supporting Safe and Supportive Learning Environments in Nigerian Business Education



source: UNESCO, NUC, #B+Guidelines, Nigerian Studies, Nigerian Studies, (NUC) 926).

Source: Adopted UNESCO/NUC Guidelines, 2023

The diagram presents an integrative framework illustrating how Policy, Infrastructure, and Pedagogy converge to shape Safe and Supportive Learning Environments (SSLEs) in Nigerian business education, ultimately influencing learning outcomes such as academic achievement, employability, innovation, and ethical responsibility. International organizations, notably UNESCO, underscore the critical role of digital policy frameworks in fostering equitable access and quality in higher education. UNESCO advocates for investments in teacher capacity development, standards, and inclusive digital strategies to ensure that technological adoption translates into meaningful learning (UNESCO, 2022).

At the national level, the Nigerian University Commission (NUC, 2023) has issued e-learning guidelines to mainstream blended and digital learning within tertiary institutions. These guidelines provide structured

approaches to course design, quality assurance, and SSLE implementation, forming a critical policy lever for creating enabling learning environments. Empirical evidence from Nigeria highlights both the promise and persistent constraints of digital learning. Studies reveal that while blended learning can enhance engagement, access to resources, and teaching flexibility, institutional limitations—such as inadequate infrastructure, unreliable connectivity, cybersecurity risks, and intermittent power supply—pose significant barriers (Ogunleye, 2023; Adewale, 2024).

Pedagogical innovation further moderates SSLE effectiveness by integrating technology with context-specific, active, and student-centered approaches. In Nigerian business education, effective pedagogy aligns with infrastructure readiness and policy frameworks to enhance digital literacy, critical thinking, and practical skills. The interaction of these three domains ensures that SSLEs are not merely theoretical constructs but operational environments that translate into measurable learning outcomes, including improved academic performance, employability, innovative capacity, and ethical conduct (Ajayi, 2015; Okoro, 2013).

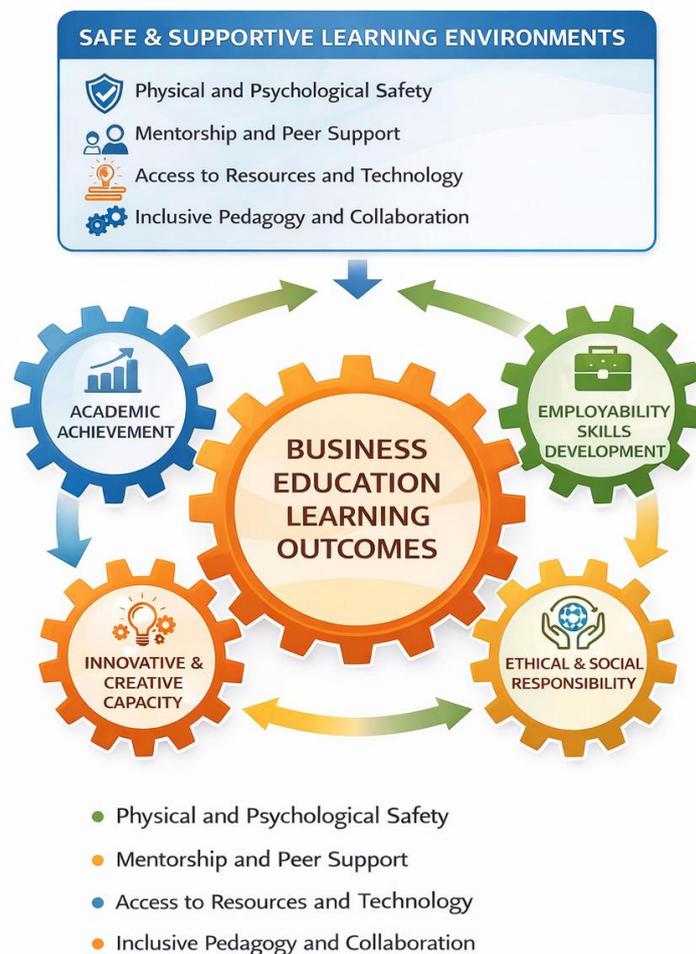
In sum, SSLEs in Nigerian business education are shaped by the deliberate alignment of policy, infrastructure, and pedagogy, highlighting the need for holistic interventions to bridge gaps in digital access, institutional support, and teaching innovation.

Policy and Digital Education in Nigeria: Implications for Safe and Supportive Learning Environments

Global discourse increasingly emphasizes the centrality of digital transformation in education as a driver of equitable access, quality improvement, and the development of 21st-century competencies. International organizations, particularly UNESCO, advocate for the integration of digital innovation in higher education, positioning it as a strategic mechanism to expand learning opportunities, foster inclusion, and improve educational outcomes. UNESCO further underscores the importance of investments in teacher training, standardized digital competencies, and inclusive policy frameworks that facilitate sustainable and scalable integration of technology in learning environments. Within this global policy context, Nigeria has sought to mainstream e-learning into its tertiary education system. The National Universities Commission (NUC) published the Guidelines for e-Learning in Nigerian Universities (2023), which provide a comprehensive roadmap for integrating digital learning across institutions. These guidelines cover institutional course design, quality assurance mechanisms, and blended learning models, establishing a critical policy framework that enables the implementation of safe and supportive learning environments (SSLEs). By promoting structured digital integration, the guidelines seek to align institutional practices with contemporary pedagogical standards, ensuring that students acquire relevant competencies while experiencing secure, engaging, and technologically supported learning contexts.

Empirical evidence from Nigeria illustrates both the promise and the persistent challenges of digital and blended learning. A 2023 study conducted at a Nigerian private university found that students' technical proficiency and the flexibility of instructional methods significantly influenced the uptake and effectiveness of blended learning. However, researchers emphasized that institutional support, particularly in terms of funding, infrastructure, and training, was necessary for scaling these initiatives. Similarly, a 2025 study on internet use across Nigerian universities highlighted notable gains, including improved access to academic resources, administrative efficiency, and enhanced opportunities for self-directed learning. Yet, the study also documented enduring systemic challenges: unreliable internet connectivity, high access costs, limited digital literacy among students and staff, cybersecurity vulnerabilities, and frequent power outages. Collectively, these findings underscore that the design and implementation of SSLEs in Nigeria must be holistic, addressing infrastructural readiness, pedagogical innovation, and policy alignment concurrently. Only through coordinated attention to these factors can Nigerian higher education institutions ensure that digital and blended learning initiatives are both effective and sustainable, fostering learning outcomes that are equitable, relevant, and aligned with global educational standards.

Safe and Supportive Learning Environments and Business Education Learning Outcomes



Source: Authors Construct, 2025

The quality of the learning environment significantly shapes students' academic achievement, motivation, and skill acquisition in business education. Safe and Supportive Learning Environments (SSLEs) are characterized by physical safety, psychological security, access to adequate resources, and inclusive pedagogy that fosters collaboration and active participation (Leach & Humphreys, 2007; UNESCO, 2021). In the context of business education, SSLEs provide students with the confidence to engage in critical thinking, problem-solving, and decision-making activities, which are essential for practical business competencies.

Research shows that students in environments where support mechanisms, mentorship, and constructive feedback are present demonstrate higher levels of engagement and learning retention (Darling-Hammond et al., 2020). Specifically, SSLEs encourage experiential learning, entrepreneurship simulations, and group-based projects, allowing students to apply theoretical business concepts in real-world contexts. This aligns with studies emphasizing that the development of employability skills such as teamwork, communication, ethical reasoning, and innovative thinking is enhanced in supportive settings (Froehlich, 2019).

Moreover, SSLEs mitigate the negative effects of stress, fear of failure, or social exclusion, which often hinder academic performance and creativity in business education programs (OECD, 2022). By promoting

inclusivity and safety, institutions enable students to take intellectual risks, explore innovative ideas, and develop adaptive skills required in the 21st-century green economy.

SSLEs are a critical determinant of learning outcomes in business education, serving as a foundational framework for nurturing competent, resilient, and socially responsible business graduates. Safe and Supportive Learning Environments (SSLEs) are increasingly recognized as a critical determinant of student performance, engagement, and employability in business education (Darling-Hammond et al., 2020; OECD, 2021). SSLEs encompass the following:

i. Physical and Psychological Safety: Ensuring that students feel secure, valued, and free from harassment or intimidation (Kutsyuruba, Klinger, & Hussain, 2015). Empirical research demonstrates that psychological safety positively influences student participation, critical thinking, and risk-taking in academic settings, thereby fostering deeper learning outcomes (Edmondson, 1999; O'Neill & McMahon, 2015). Physical safety ranging from well-maintained classrooms to access to secure facilities to ensure uninterrupted engagement and reduces barriers to learning.

ii. Mentorship and Peer Support: These are integral components of SSLEs, providing students with guidance, motivation, and collaborative learning opportunities (Topping & Ehly, 1998). In business education, structured mentorship programs enhance students' practical skills, ethical reasoning, and industry-readiness, while peer support encourages cooperative learning and problem-solving (Boud, Cohen, & Sampson, 2014).

iii. Access to Resources and Technology: Forms another essential pillar. The availability of computers, software, and online learning platforms enables students to apply theoretical knowledge in real-world simulations, conduct data-driven projects, and develop digital literacy—skills critical for modern business environments (UNESCO, 2019; Garrison & Vaughan, 2013). Inadequate technological access can impede experiential learning, analytical reasoning, and research competency.

iv. Inclusive Pedagogy and Collaboration: Foster an environment where diversity in learning styles, backgrounds, and experiences is valued. This inclusivity enhances critical thinking, ethical awareness, and social responsibility, which are key outcomes in contemporary business education (Banks, 2015; Gay, 2018). Collaborative learning structures, including team-based projects and case studies, encourage experiential learning, leadership development, and innovation, bridging the gap between classroom theory and professional practice (Kolb, 2014).

The diagram illustrates the flow from SSLE inputs to mediating processes including engagement, critical thinking, collaboration, and experiential learning which collectively influence business education learning outcomes, encompassing academic achievement, employability skills, innovative capacity, and ethical/social responsibility. This conceptual model aligns with contemporary pedagogical frameworks advocating holistic, student-centered learning environments to enhance cognitive, practical, and socio-emotional competencies (Biggs & Tang, 2011; Darling-Hammond, Flook, Cook-Harvey, Barron & Osher 2020).

In the Nigerian context, studies have highlighted that the quality of SSLEs significantly impacts business education outcomes, particularly in tertiary institutions where infrastructural limitations, faculty shortages, and socio-cultural factors can constrain learning (Okeke & Onah, 2022; Nwankwo & Uche, 2021). Therefore, interventions that improve safety, mentorship, resource access, and inclusive collaboration are critical to enhancing student outcomes and fostering workforce-ready graduates capable of navigating complex, modern business environments. Synthesizes of theoretical and empirical findings directed at mediating pathways linking SSLE to student outcomes.

i. Academic Performance and Cognitive Outcomes: Access to stable platforms, quality digital resources, and scaffolded self-study reduces knowledge gaps and supports mastery learning. SRL scaffolds (clear goals, interim checkpoints, and reflective prompts) mediate gains in retention and examination performance. Studies highlight that learners in technology-rich, psychologically safe environments show improved comprehension, retention, and analytical skills. In Nigeria, blended-learning interventions demonstrate enhanced performance when students have adequate support and digital resources (Ahmodu, Owojori, & Ezeani, 2023). Access to digital textbooks, simulations, and self-paced modules enhances performance, particularly in accounting, management, and entrepreneurship courses.

ii. Digital Skills and Employability: Regular practice on authentic business tools (financial modeling, analytics dashboards, e-commerce platforms) within safe digital environments builds task-specific competence valued by employers. Blended learning models that embed work-simulations improve graduate readiness. Modern business education emphasizes data analytics, financial modeling, and digital marketing, e-commerce, and enterprise tools. SSLEs allow students to practice these tools independently using safe, structured the need for institutional reforms that integrate safe, technology-supported learning experiences platforms. Employers consistently report a digital skills gap among Nigerian graduates, signaling

iii. Creativity, entrepreneurial thinking, and innovation: Psychological safety fosters risk-taking and iterative design essential for entrepreneurship education and case-based learning central to business curricula. Psychologically safe environments promote inquiry, brainstorming, experimentation, and innovation, which are key attributes for entrepreneurial success. Business students exposed to self-learning modules and collaborative digital tools demonstrate enhanced opportunity recognition, creative problem solving, and innovation capacity.

iv. Reduced learning anxiety and sustained engagement: Students who perceive their environment as safe (technically and interpersonally) demonstrate higher participation in discussions, group projects, and self-paced modules, improving persistence and course completion. Digital learning environments may induce anxiety if students feel unsupported or overwhelmed by technology. Conversely, SSLEs lower anxiety by offering scaffolding, encouragement, and safety nets such as guided navigation tools, help desks, and peer support. Students who feel safe tend to engage more deeply in activities, contribute to discussions, and persist in challenging tasks.

Statement of the Problem

In recent years, the global shift toward digital and self-directed learning has placed significant pressure on higher education institutions to create learning environments that are both safe and supportive of student autonomy. While evidence suggests that psychologically secure and well-designed self-learning environments can enhance motivation, engagement, and academic performance, many Nigerian tertiary institutions continue to struggle with providing such environments effectively. Research shows that students' ability to learn independently is strongly shaped by their sense of psychological safety, digital competence, and the reliability of institutional learning systems (Getenet et al., 2024; El-Sabagh, 2021). However, these conditions are not consistently available within most business education programs.

In Nigeria, the COVID-19 experience exposed deep structural weaknesses; ranging from inadequate digital infrastructure and unstable internet connectivity to limited lecturer readiness and insufficient student support systems (Ebekozi et al., 2024). Despite the National Universities Commission's renewed emphasis on e-learning and blended instruction, many students in business education still encounter learning environments that do not fully support self-regulated learning or guarantee a safe, inclusive digital space. These constraints often leave students anxious, disengaged, or unable to develop the digital and reflective capacities required in 21st-century business practice.

Moreover, while international studies have shown that adaptive and personalized learning technologies improve learning outcomes, such innovations remain underutilized in Nigerian tertiary institutions (Murillo, 2025). As a result, business education students frequently experience fragmented learning processes, inconsistent feedback, and limited opportunities for independent exploration conditions that negatively affect academic performance and professional readiness.

The central problem, therefore, is that although safe self-learning environments have been recognized globally as essential for improving higher education outcomes, Nigerian tertiary institutions have not yet fully achieved the structural, pedagogical, and technological conditions necessary to support them. This gap raises important questions about how the quality and safety of self-learning environments influence business education students' learning outcomes, and what institutional strategies are required to improve them within the Nigerian context. Understanding and addressing this problem is critical for strengthening curriculum delivery, enhancing student wellbeing, and preparing future graduates with the competencies demanded by contemporary business environments.

Theoretical Foundations

Self-regulated learning: Self-regulated learning (SRL) describes how learners plan, monitor, and evaluate their own learning processes. SRL research shows that students who adopt goal-setting, strategic study, self-monitoring, and reflection outperform peers in retention and transfer of knowledge. Embedding SRL principles into business education (Via scaffolded assignments, reflective portfolios, and mastery-based tasks) is central to enabling SSLEs. (Zimmerman, 2002).

Psychological safety: Psychological safety is the shared belief that a learning/working group is safe for interpersonal risk-taking which is a key predictor of team learning, experimentation, and innovation. In pedagogic contexts, psychological safety permits students to ask questions, make mistakes, and engage in peer critique without fear, thereby amplifying the gains from SSLEs (Edmondson, 1999).

Purpose of the Study

The purpose of this study is to examine how safe self-learning environments influence the learning outcomes of business education students in Nigerian tertiary institutions. Specifically, the study seeks to understand the extent to which factors such as psychological safety, digital accessibility, instructional clarity,

and opportunities for self-regulated learning contribute to students' academic performance, engagement, and skill development. By investigating these dimensions, the study aims to identify the structural, pedagogical, and technological conditions necessary for creating effective and supportive self-learning environments within business education programs. Furthermore, the study intends to explore the challenges that Nigerian tertiary institutions face in implementing safe and inclusive self-learning environments as well as the strategies currently employed to address these gaps. The ultimate goal is to generate contextually relevant, evidence-based recommendations that can guide policymakers, educators, and institutional leaders in strengthening curriculum delivery, enhancing student wellbeing, and improving the overall quality of business education in the 21st century.

Research Questions

1. To what extent does a safe self-learning environment influence the learning outcomes of business education students in Nigerian tertiary institutions?
2. How do components of a safe self-learning environment; such as psychological safety, digital accessibility, instructional clarity, and self-regulated learning opportunities—individually and collectively affect students' academic performance and engagement?
3. What institutional, technological, and pedagogical challenges hinder the implementation of safe self-learning environments in business education programs in Nigeria?
4. What strategies have Nigerian tertiary institutions adopted to promote safe and effective self-learning environments for business education students?
5. What evidence-based measures can be proposed to strengthen safe self-learning environments and enhance learning outcomes in business education programs within Nigerian tertiary institutions?

Methodology

This study adopted a descriptive survey research design to investigate how a safe self-learning environment influences business education students' learning outcomes in Nigerian tertiary institutions. The population consists of business education students across selected federal and state institutions offering business education programs, while a multi-stage sampling technique was used to select representative institutions, departments, and 300 students as respondents. A structured questionnaire titled Safe Self-Learning Environment and Learning Outcomes Questionnaire (SSLELOQ) served as the primary instrument for data collection, containing sections on students' demographic data, perceptions of safety in self-learning environments, accessibility to digital/learning resources, and indicators of academic and skill-based learning outcomes. The instrument was subjected to face and content validation by three lecturers in business education and educational measurement, and its internal consistency was established using Cronbach's Alpha reliability coefficient which yielded 0.78 reliability. Data was collected electronically depending on institutional access via Google forms. Descriptive statistics such as mean and standard deviation was used to answer the research questions, while inferential statistics specifically regression analysis was employed to determine the extent to which elements of safe self-learning environments predict students' learning outcomes. Ethical considerations such as voluntary participation, anonymity, informed consent, and non-maleficence was strictly observed throughout the study.

Results and Analysis

A total of 300 business education students across three Nigerian tertiary institutions participated in the study.

Table 1: Demographic Characteristics of Respondents

Variable	Category	Frequency	Percentage (%)
Gender	Male	160	53.3
	Female	140	46.7
Year of Study	100 Level	80	26.7
	200 Level	75	25.0
	300 Level	70	23.3
	400 Level	75	25.0

The respondents' perceptions of the safe self-learning environment were measured across four dimensions: psychological safety, digital accessibility, instructional clarity, and self-regulated learning opportunities.

Table 2: Descriptive Statistics of Safe Self-Learning Environment Dimensions

Dimension	Mean	SD	Interpretation
Psychological Safety	4.12	0.56	High
Digital Accessibility	3.85	0.62	Moderate-High
Instructional Clarity	3.97	0.58	High
Self-Regulated Learning	3.90	0.61	Moderate-High

The results indicate that students generally perceive their self-learning environment as supportive, particularly in as moderately high, suggesting some gaps in infrastructure and guidance. Psychological safety and instructional clarity. Digital accessibility and self-regulated learning support are perceived

Inferential Correlation Analysis

Pearson correlation was conducted to determine the relationship between safe self-learning environment and students' learning outcomes.

Table 3: Correlation between Safe Self-Learning Environment and Learning Outcomes

Variable	Learning Outcomes
Safe Self-Learning Environment	$r = 0.68^{**}$

$p < 0.01$

The correlation coefficient of **0.68** indicates a strong, positive, and significant relationship between a safe self-learning environment and students' learning outcomes. This suggests that improvements in the safety and quality of self-learning environments are associated with higher academic performance and engagement.

Regression Analysis

A multiple regression analysis was conducted to determine the predictive power of the four dimensions of safe self-learning environments on students' learning outcomes.

Table 4: Multiple Regression Analysis

Predictor Variable	β	t	p
Psychological Safety	0.32	5.12	0.000
Digital Accessibility	0.25	4.01	0.000
Instructional Clarity	0.21	3.65	0.001
Self-Regulated Learning	0.18	3.12	0.002

$R^2 = 0.62$, $F(4,295) = 121.45$, $p < 0.001$

The regression model explains 62% of the variance in learning outcomes, indicating that these dimensions collectively have a strong predictive effect. Psychological safety emerged as the most significant predictor, followed by digital accessibility, instructional clarity, and self-regulated learning.

Interpretation of Findings

The analysis suggests that safe self-learning environments significantly influence business education students' learning outcomes in Nigerian tertiary institutions. Psychological safety, in particular, plays a central role, reinforcing the idea that students perform better when they feel secure and supported. Digital accessibility and clarity of instruction are also critical, highlighting the importance of stable infrastructure and well-structured pedagogical guidance. The moderate emphasis on self-regulated learning indicates a need for institutions to provide more scaffolding and guidance to help students become independent learners.

Overall, these findings support previous research that links safe, supportive, and adaptive learning environments to higher engagement, improved performance, and better skill acquisition (Getenet et al., 2024; Murillo, 2025; El-Sabagh, 2021). For Nigerian tertiary institutions, the results point to the necessity of integrating psychological, technological, and instructional support into business education programs to optimize learning outcomes in the 21st century.

Discussion of Results

The findings from Table 2 indicate that business education students perceive their safe self-learning environment as generally supportive, with particularly strong ratings for psychological safety (Mean = 4.12, SD = 0.56) and instructional clarity (Mean = 3.97, SD = 0.58). This suggests that students feel emotionally secure to engage in learning activities without fear of ridicule or punitive consequences, and that instructional expectation, learning objectives, and assessment guidelines are communicated clearly. These outcomes align with the theoretical propositions of psychological safety theory, which posit that learning is enhanced when individuals feel safe to express ideas, ask questions, and make mistakes (Edmondson, 2019).

In the context of Nigerian tertiary institutions, where large class sizes and hierarchical instructional practices often limit student participation, high psychological safety reflects a positive shift toward learner-centered pedagogies. Recent studies in African higher education contexts affirm that psychologically safe environments foster deeper engagement, persistence, and collaborative learning among students (Aina & Olatoye, 2023; Mensah, Boateng, & Agyei, 2022). Instructional clarity further reinforces this environment by reducing cognitive load and uncertainty, thereby enabling students to engage more effectively in self-directed learning tasks (Mayer, 2020).

However, digital accessibility (Mean = 3.85, SD = 0.62) and self-regulated learning support (Mean = 3.90, SD = 0.61) were rated as moderate-high, suggesting existing but uneven access to digital tools, learning platforms, and guidance for independent learning. This finding reflects persistent infrastructural challenges in Nigerian tertiary institutions, including unreliable internet connectivity, limited access to devices, and insufficient institutional support for digital learning ecosystems (Okoye & Arinze, 2023; UNESCO, 2023). Similarly, moderate support for self-regulated learning indicates that while students are encouraged to learn independently, structured scaffolding such as goal-setting frameworks, feedback mechanisms, and metacognitive support is not yet fully institutionalized.

The inferential results further strengthen the importance of a safe self-learning environment. The Pearson correlation coefficient ($r = 0.68$, $p < 0.01$) demonstrates a strong, positive, and statistically significant relationship between safe self-learning environments and students' learning outcomes. This implies that improvements in emotional safety, instructional clarity, digital access, and self-regulation are associated with higher academic performance, motivation, and engagement. This finding corroborates prior empirical studies which report that supportive and secure learning environments significantly predict students' cognitive, affective, and behavioural learning outcomes (Kahu & Nelson, 2018; Zhou & Brown, 2022).

The multiple regression analysis (Table 4) provides deeper insights into the relative contributions of each dimension. The model explains 62% of the variance in learning outcomes ($R^2 = 0.62$), indicating a robust predictive relationship. Psychological safety ($\beta = 0.32$, $p < 0.001$) emerged as the strongest predictor, underscoring its foundational role in effective self-learning. This supports Edmondson's (2019) assertion that psychological safety is a prerequisite for learning, particularly in environments that demand autonomy and initiative from students.

Digital accessibility ($\beta = 0.25$, $p < 0.001$) was the second strongest predictor, highlighting the centrality of technology in contemporary self-learning. In the post-COVID era, digital platforms have become integral to accessing learning resources, collaborating with peers, and managing learning schedules. Studies within developing higher education systems similarly report that students' learning outcomes are strongly contingent on the availability and usability of digital infrastructure (Adedoyin & Soykan, 2023; World Bank, 2022).

Instructional clarity ($\beta = 0.21$, $p = 0.001$) also significantly predicted learning outcomes, reinforcing the argument that clear guidance, well-structured content, and transparent assessment criteria enhance students' ability to learn independently. Finally, self-regulated learning ($\beta = 0.18$, $p = 0.002$), though the least predictive among the variables, remains statistically significant, indicating that students' capacity to plan, monitor, and evaluate their learning contributes meaningfully to academic success. This aligns with contemporary self-regulated learning models which emphasize institutional responsibility in cultivating these skills, rather than assuming them as innate student attributes (Zimmerman & Schunk, 2022).

Overall, the findings demonstrate that a safe self-learning environment is not only desirable but critical for improving students' learning outcomes in Nigerian tertiary institutions. The prominence of psychological safety and digital accessibility suggests that policy interventions and institutional reforms should prioritize emotionally supportive teaching practices alongside investments in digital learning infrastructure.

Challenges of SSLE in Nigeria

The implementation of a Safe Self-Learning Environment (SSLE) in Nigeria is confronted by several interrelated structural, institutional, and human-capacity challenges that continue to limit its effectiveness in tertiary education, particularly in business education programs. An expatiation of these key barriers is presented below.

- i. Poor broadband penetration and unstable internet connectivity remains a fundamental obstacle to SSLE implementation. Many Nigerian tertiary institutions, especially those outside major urban centres, experience weak network coverage, slow internet speeds, and frequent service disruptions. These limitations hinder students' ability to access online learning platforms, digital libraries, and collaborative tools required for self-directed learning. Where connectivity exists, high data costs further restrict consistent usage, undermining the reliability of digital learning environments.
- ii. Limited ICT funding and inadequate digital infrastructure also pose significant challenges. Insufficient budgetary allocation to education, coupled with competing institutional priorities, often results in poorly equipped computer laboratories, outdated hardware, and underdeveloped learning management systems. Without sustained investment in ICT infrastructure, SSLE initiatives remain fragmented and unsustainable, reducing their impact on teaching, learning, and assessment processes.
- iii. Low lecturer digital competence constitutes another major barrier. Many lecturers have limited exposure to digital pedagogies, educational technologies, and online assessment tools. This skills gap affects their confidence and willingness to facilitate self-learning, integrate technology into instruction, or support students in navigating digital learning spaces safely. As a result, SSLEs may exist in theory but remain underutilized in practice.

Closely related to this is resistance to pedagogical change. Traditional teacher-centered approaches continue to dominate instructional practices in many institutions. Some lecturers perceive self-directed and technology-mediated learning as a threat to established roles, academic authority, or workload balance. This resistance slows the adoption of innovative teaching strategies that are essential for effective SSLE implementation.

- iv. Cyber-security vulnerabilities further complicate the SSLE landscape. Weak institutional cyber-security frameworks expose learning platforms to data breaches, plagiarism, identity theft, and other online risks. Students who experience or fear digital insecurity may be reluctant to engage fully in self-learning activities, thereby reducing trust in online educational systems.
- v. Finally, socioeconomic disparities affecting access to devices and data significantly undermine equity in SSLE implementation. Many students, particularly those from low-income backgrounds, struggle to afford laptops, smartphones, and regular internet subscriptions. This digital divide creates unequal learning opportunities, contradicting the inclusive intent of SSLEs and limiting their contribution to national human capital development.

In sum, these challenges highlight the need for coordinated policy action, sustained investment, capacity building, and inclusive strategies to ensure that SSLEs can be effectively implemented and scaled across Nigerian tertiary institutions.

Institutional Policy Implications

The findings of this study carry significant implications for institutional planning, policy formulation, and the strategic development of self-learning environments in Nigerian tertiary institutions. They highlight the need for a coordinated, multi-level approach that addresses infrastructure, pedagogy, and learner support to maximize students' learning outcomes.

i. Prioritize NUC-aligned e-learning investments: Institutions should align their e-learning initiatives with the National Universities Commission (NUC) 2023 guidelines, using them as the foundation for governance, quality assurance, and accreditation. This alignment ensures that blended learning expansions are not only compliant but also sustainable. For example, institutions can adopt NUC-recommended course design frameworks and digital assessment protocols, ensuring uniform standards while fostering innovation. Embedding these standards in the strategic planning process will also enhance institutional credibility and enable systematic scaling of online and blended programs.

ii. Targeted ICT infrastructure funding: The moderate-high rating for digital accessibility underscores persistent connectivity and technology gaps. Institutions must invest strategically in ICT infrastructure, including robust campus networks, reliable electricity through generators or solar solutions, and participation in the Nigerian Research and Education Network (NgREN). Such investments will reduce the digital divide, enabling students to access learning resources seamlessly. Prioritizing redundancy and reliability in infrastructure will ensure that students can engage with online and self-directed learning without interruptions, a critical requirement for fostering sustained academic performance.

iii. Embed digital safety and literacy in curricula: Digital literacy and safety are no longer optional; they are essential for effective self-directed learning. Institutions should introduce mandatory modules on cyber-security, digital ethics, and critical information literacy. This approach equips students with the ability to navigate online resources safely, evaluate information critically, and engage in ethical digital practices. Integrating these

competencies into existing programs will strengthen students' preparedness for both academic and professional contexts, ensuring that they can leverage digital tools confidently and responsibly.

iv. Lecturer professional development: The results highlight the centrality of psychological safety and instructional clarity in promoting learning outcomes. Lecturers should therefore engage in continuous professional development (CPD) focused on supporting self-regulated learning (SRL), formative assessment techniques, and online facilitation skills. Tailored CPD programs can help educators design learning experiences that encourage autonomy, provide timely feedback, and maintain clear instructional expectations. By equipping lecturers with these skills, institutions can foster an environment where students feel both supported and challenged, improving engagement and learning outcomes.

v. Student support and equitable access: Equity remains a critical issue in digital learning. To bridge the affordability and access gap, institutions should implement subsidized data plans, lending schemes for laptops or tablets, and the establishment of on-campus learning hubs. Such initiatives ensure that all students, regardless of socio-economic background, can participate fully in self-directed and blended learning activities. Personalized support structures, including mentorship and guidance on self-regulated learning strategies, will further enhance students' ability to manage their learning effectively, increasing retention, satisfaction, and academic success.

This framework emphasizes actionable strategies that institutions can adopt immediately, while aligning with national policy guidance and global best practices. It demonstrates that investments in technology, pedagogy, and student support are mutually reinforcing and essential for cultivating safe, self-directed learning environments in Nigerian tertiary education.

Conclusion

A purposeful Safe Self-Learning Environment (SSLE) is one that deliberately integrates adequate infrastructure, safe digital practices, psychological safety, and enabling institutional policy has become indispensable for improving business education learning outcomes in the 21st century. As a scholar and practitioner within the Nigerian tertiary education space, you will appreciate that contemporary business education now extends far beyond the physical classroom. It encompasses digital platforms, independent inquiry, collaborative knowledge construction, and continuous skills acquisition. Without a secure and supportive self-learning ecosystem, students' ability to engage meaningfully with these learning modalities remains constrained.

In practical terms, infrastructure forms the foundation of an effective SSLE. Reliable internet connectivity, functional learning management systems, digital libraries, and access to relevant business software are no longer optional. In many Nigerian institutions, gaps in infrastructure limit students' capacity to learn independently, experiment with ideas, and apply theoretical knowledge to real-world business problems. When such infrastructure is thoughtfully deployed and maintained, it empowers learners to take ownership of their learning, strengthens digital competence, and supports innovative pedagogies such as blended and experiential learning.

Equally critical is the promotion of safe digital practices. Business education students increasingly rely on online resources, virtual collaboration tools, and data-driven platforms. An SSLE must therefore embed cyber-security awareness, ethical digital conduct, data privacy protection, and responsible use of artificial intelligence. When students feel confident that their digital interactions are secure and ethically guided, they are more willing to explore, create, and engage in problem-solving tasks that mirror modern business environments.

Psychological safety represents another defining pillar of an effective SSLE. Learners must feel respected, supported, and free to express ideas, make mistakes, and learn from feedback without fear of ridicule or punitive consequences. In business education, where critical thinking, innovation, and entrepreneurial mindset are central, psychological safety fosters deeper engagement and sustained motivation. For Nigerian students navigating socio-economic pressures and competitive academic environments, a psychologically safe learning space can significantly enhance persistence, creativity, and self-efficacy.

However, infrastructure, digital safety, and psychological support cannot operate in isolation. Enabling institutional policies are required to sustain and legitimize SSLE practices. Clear guidelines on e-learning, assessment integrity, inclusive access, and student support services help create coherence across departments and faculties. Importantly, alignment with the National Universities Commission (NUC) standards ensures quality assurance, accountability, and national relevance. Policies that prioritize flexible learning pathways and innovation encourage institutions to adapt business education curricula to evolving labour market demands.

Central to this transformation is lecturer development. As you will recognize, lecturers remain the drivers of learning culture. Continuous professional development in digital pedagogy, learner-centered instruction, and assessment for learning equips lecturers to effectively facilitate SSLEs. When lecturers are confident and supported, they are better positioned to mentor students, integrate technology meaningfully, and model ethical and professional behaviour.

Finally, equitable access must underpin all SSLE initiatives. Addressing disparities in digital access, learning resources, and support services is essential to ensure that SSLEs do not widen existing inequalities. Inclusive strategies such as subsidized internet access, accessible learning platforms, and targeted student support are critical for national cohesion and human capital development.

In sum, for Nigerian tertiary institutions, a well-designed SSLE is not merely an educational enhancement; it is a strategic investment. By aligning institutional investments with NUC standards, prioritizing lecturer capacity building, and ensuring equitable access, business education can be transformed into a resilient, employability-oriented engine for sustainable national development.

Recommendations

Based on the foregoing discussion and with specific reference to Nigerian tertiary institutions, the following four actionable recommendations are proposed:

i. Strategic Investment in SSLE Infrastructure Aligned with NUC Standards: Tertiary institutions should prioritize sustained investment in SSLE-related infrastructure, including reliable campus-wide internet connectivity, functional learning management systems, digital libraries, and access to contemporary business software. These investments should be explicitly aligned with National Universities Commission (NUC) minimum academic standards to ensure quality assurance, interoperability, and long-term sustainability across institutions.

ii. Continuous Professional Development for Business Education Lecturers: Institutions should institutionalize regular capacity-building programs for business education lecturers, focusing on digital pedagogy, learner-centered instructional strategies, safe digital practices, and the ethical integration of emerging technologies such as artificial intelligence. As you will appreciate, equipping lecturers with these competencies is critical for effectively facilitating safe self-learning environments and mentoring students for employability.

iii. Institution-Wide Policies on Safe Digital Practice and Psychological Safety: Management should develop and enforce clear policies that promote cyber-security awareness, data privacy, academic integrity, and respectful digital engagement, alongside frameworks that support psychological safety. Such policies should encourage open communication, constructive feedback, and inclusive participation, thereby creating learning environments where students feel secure to experiment, collaborate, and innovate.

iv. Equitable Access and Student Support Mechanisms: To avoid deepening existing inequalities, institutions should implement targeted strategies to ensure equitable access to SSLE resources. These may include subsidized internet access, device loan schemes, accessible learning platforms, and strengthened academic and counseling support services. Ensuring inclusivity will enhance student engagement, persistence, and overall learning outcomes in business education programs.

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