STRATEGIES FOR INCORPORATING TECHNOLOGY INTO BUSINESS AND ENTREPRENEURSHIP EDUCATION PLANNING

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Abstract

Business and entrepreneurship education (BEE) play a crucial role in preparing learners with the competencies required for innovation, employability, and economic growth. However, many institutions in Nigeria face challenges in effectively integrating technology into teaching and curriculum planning due to infrastructural limitations, limited faculty readiness, policy gaps, and issues of equity. This paper proposes a Six-Pillar Framework as a strategic approach for incorporating technology into BEE planning. The framework emphasizes infrastructure development, faculty capacity building, curriculum innovation, policy and governance, equity and inclusivity, and stakeholder partnerships. Each of these interdependent pillars provides direction for creating sustainable, inclusive, and context-sensitive strategies that align with national digital transformation policies. By adopting this holistic approach, institutions can transform business education into a driver of entrepreneurship, digital competence, and self-reliance. The paper concludes that deliberate incorporation of technology through systematic planning will reposition BEE as a catalyst for innovation and national development in the digital economy.

Keywords: Business and entrepreneurship education; technology incorporation; strategic planning

Introduction

The accelerating pace of technological innovation is redefining business and entrepreneurship education (BEE) worldwide. Digital tools such as artificial intelligence, e-commerce platforms, cloud-based collaboration, and mobile applications have transformed the ways enterprises operate, compete, and create value (Dabbagh & Kitsantas, 2021). In developing countries such as Nigeria, the integration of technology into higher education is particularly urgent given persistent challenges of graduate unemployment, skills mismatch, and socio-economic instability (Adeboye, 2020; Val & Akpomi, 2019).

BEE occupies a central role in equipping learners with knowledge and entrepreneurial skills required to succeed in today's digital economy. Beyond preparing students for white-collar jobs, effective business and entrepreneurship programs foster innovation, self-employment, and problem-solving capacity (Onokpaunu & Okonkwo, 2021). Scholars argue that the fusion of entrepreneurial thinking with digital competence is critical to building a workforce capable of driving economic growth in the twenty-first century (Nwaokokorom & Ikpeama, 2023). However, despite the introduction of national frameworks such as the National Digital Economy Policy and Strategy (NDEPS, 2020–2030), many institutions continue to struggle with inadequate infrastructure, limited faculty readiness, outdated curricula, and insufficient funding (Offiong, Caleb, & Effiong, 2019).

These persistent challenges create a gap between national aspirations for digital transformation and the realities of institutional capacity. This paper therefore examines strategies for sustainable integration of technology into BEE. It proposes a Six-Pillar Framework, infrastructure development, faculty capacity building, curriculum innovation, policy and governance, equity and inclusivity, and stakeholder partnerships, as a holistic model for bridging these gaps. By drawing on recent global and local literature, the paper offers a structured conceptual roadmap for educators, policymakers, and administrators to reposition BEE as a driver of innovation, employability, and inclusive national development.

Business and Entrepreneurship Education in Nigeria

Business and entrepreneurship education (BEE) are central to Nigeria's effort to develop a knowledge-driven economy and address high youth unemployment rates. Business education traditionally equips students with professional skills in accounting, management, marketing, and office technology, while entrepreneurship education cultivates creativity, risk-taking, and the competencies required to start and manage enterprises (Onokpaunu & Okonkwo, 2021). In practice, the two fields increasingly overlap as curricula integrate entrepreneurial content into business studies to prepare learners for both employment and self-reliance (Val & Akpomi, 2019).

Over the past decade, Nigerian tertiary institutions have introduced entrepreneurship courses, created entrepreneurship development centres, and promoted business plan competitions. These reforms reflect global trends toward embedding entrepreneurial mindsets into higher education. However, challenges such as poor digital infrastructure, reliance on traditional teaching methods, and minimal use of technology continue to undermine the quality of outcomes (Nwokike & Chukwuma, 2019; Offiong, Caleb, & Effiong, 2019).

Technology Incorporation in Education

Technology integration refers to the purposeful application of digital tools and platforms to enhance teaching, learning, and administration (Ile, Udegbunam, & Odimmega, 2019). Effective integration goes beyond superficial use of ICT; it requires alignment of digital resources with curricula, pedagogy, and assessment strategies (Dabbagh & Kitsantas, 2021). Within BEE, technology can take multiple forms, including learning management systems, business simulations, virtual lectures, mobile learning platforms, and e-commerce projects.

Research suggests that when effectively deployed, these tools improve learner engagement, motivation, and problem-solving abilities (Fryer, Nakao, & Thompson, 2019). In addition, digital applications expose students to real-world entrepreneurial contexts, enabling them to practice decision-making and develop relevant competencies (Binuomote, Igu, & Eze, 2022). Despite these benefits, integration in Nigeria remains slow due to infrastructural, financial, and institutional barriers (Adeboye, 2020).

Theoretical Perspectives on Adoption

The adoption of technology in education is explained by several theoretical models. Contemporary studies adapted from the Technology Acceptance Model (TAM) emphasize that perceived usefulness and ease of use significantly shape educators' and students' willingness to embrace ICT (Fryer et al., 2019). Similarly, the Diffusion of Innovation Theory highlights social systems and communication channels as critical to the speed of technology adoption (Onokpaunu & Okonkwo, 2021). More recent research underscores the importance of faculty confidence and institutional support structures in determining successful integration outcomes (Timya, Nwosu, & Mbeazie, 2019).

Taken together, the literature shows that while Nigerian higher education recognizes the importance of technology in BEE, practical integration is constrained by systemic barriers. This reinforces the need for a comprehensive framework that addresses infrastructure, faculty development, curriculum reform, inclusive access, governance, and partnerships.

Policy Context and Institutional Readiness

Nigeria has articulated ambitious digital transformation policies, most notably the National Digital Economy Policy and Strategy (NDEPS, 2020–2030), which emphasizes broadband expansion, digital literacy, innovation ecosystems, and the integration of ICT in all sectors of the economy (Federal Ministry of Communications and Digital Economy, 2020). Within higher education, the policy provides a framework for institutions to align curricula with the skills required in a digital economy. However, evidence shows that many universities, polytechnics, and colleges of education remain ill-prepared to operationalize these policies effectively (Adeboye, 2020). Key challenges include unreliable electricity supply, limited broadband access, outdated ICT infrastructure, and inadequate funding mechanisms (Offiong, Caleb, & Effiong, 2019). Moreover, most institutions lack detailed ICT strategic plans tailored to their unique needs, resulting in poor alignment between national aspirations and institutional realities (Onokpaunu & Okonkwo, 2021).

Rationale for Technology Incorporation in BEE

incorporating technology into business and entrepreneurship education (BEE) is no longer optional; it is essential for preparing graduates to thrive in a digital-first economy. Employers increasingly demand proficiency in digital tools, e-commerce operations, virtual collaboration, and data analytics, making it necessary for curricula to embed these competencies (Binuomote, Igu, & Eze, 2022). When properly implemented, technology not only bridges skill gaps but also enhances teaching and learning outcomes.

Research indicates that digital applications such as simulations, mobile learning, and interactive platforms significantly improve learner engagement and motivation (Fryer, Nakao, & Thompson, 2019). These tools foster deeper understanding, critical thinking, and autonomy, which are vital for entrepreneurial problem-solving. In addition, technology enhances flexibility and accessibility, allowing students in remote or underserved areas to access quality education through mobile devices and online platforms (Jiboye, Adeleke, & Akintunde, 2023).

Moreover, technology offers opportunities for innovation and entrepreneurship. incorporating e-commerce projects, digital marketing, and business simulations into coursework provides experiential learning that builds confidence in venture creation (Nwokike & Chukwuma, 2019). Thus, technology integration is fundamental not only for employability but also for cultivating entrepreneurial mindsets necessary for national development.

Barriers to Technology Integration

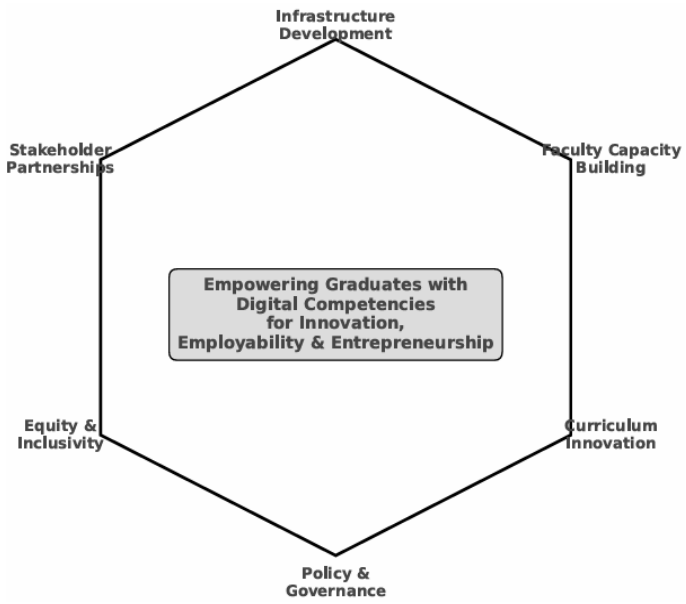
Despite the recognized importance of technology in business and entrepreneurship education (BEE), several barriers hinder its effective implementation in Nigerian institutions. One major challenge is infrastructural limitation, including unreliable electricity, poor broadband connectivity, and outdated ICT equipment, which restrict the functionality of digital initiatives (Adeboye, 2020). Financial constraints also persist, as many institutions lack adequate funding for procuring, maintaining, and upgrading ICT resources, resulting in unsustainable interventions (Timya, Nwosu, & Mbeazie, 2019).

Faculty readiness presents another obstacle. Many educators have limited digital skills and confidence, while opportunities for professional development are often irregular or insufficient (Onokpaunu & Okonkwo, 2021). Policy and governance issues further complicate integration, as institutional ICT plans are either absent or poorly aligned with national digital strategies (Offiong, Caleb, & Effiong, 2019). Additionally, concerns of equity and inclusion remain, since students in rural communities, low-income households, and those with disabilities often face compounded barriers to digital participation (Jiboye, Adeleke, & Akintunde, 2023). Addressing these challenges requires systemic and holistic approaches.

Conceptual Model of the Study

To address the challenges identified in the literature, this paper proposes a Six-Pillar Framework for Sustainable Technology incorporating in Business and Entrepreneurship Education (BEE). The framework synthesizes insights from global trends, Nigerian policy directions, and empirical studies to provide a holistic roadmap for institutions. It emphasizes that technology integration must move beyond isolated interventions to a systemic process grounded in infrastructure, human capital, governance, and inclusivity. At its core, the framework focuses on empowering graduates with digital competencies required for innovation, employability, and entrepreneurship.

Figure1



Source: Nwaokokorom (2023)

Six-Pillar Framework for Incorporating Technology into Business and Entrepreneurship Education planning

This conceptual model serves as the analytical foundation of the paper. It provides a structured basis for the recommendations that follow and ensures that policy, pedagogy, and practice are aligned toward incorporating technology into Nigerian higher education.

Infrastructure Development: Infrastructure is the backbone of technology-enabled BEE. Nigeria's recurrent bottlenecks unstable electricity, weak broadband, and obsolete hardware cripple otherwise sound initiatives (Adeboye, 2020). Institutions should adopt blended power solutions such as solar microgrids to stabilise labs and learning spaces, negotiate campus-wide broadband with telecom partners, and ring-fence budgets for cyclical upgrades and maintenance of devices, interactive boards, and licensed software (Offiong, Caleb, & Effiong, 2019). Service-level agreements, asset registers, and help-desk systems reduce downtime and ensure that digital investments remain usable for teaching and assessment.

Faculty Capacity Building: Lecturers' competence and confidence determine whether tools translate into learning. Capacity building must move beyond ad hoc workshops to structured

pathways: baseline digital-literacy certification, termly pedagogy clinics, peer mentoring, and active communities of practice (Timya, Nwosu, & Mbeazie, 2019). Training should pair technical skills with instructional design so teachers can embed simulations, analytics, and e-commerce projects meaningfully (Onokpaunu & Okonkwo, 2021). Recognition in workload models, promotion criteria, and micro-credentials sustains motivation and normalises continuous professional development.

Curriculum Innovation: Curriculum should mirror the digital economy. Core courses need explicit outcomes in data analytics, digital accounting, e-commerce operations, collaboration platforms, and cyber hygiene (Nwaokokorom & Ikpeama, 2023). Experiential strategies business simulations, virtual marketplaces, client briefs from industry, and problem-based projects deepen decision-making and problem-solving (Dabbagh & Kitsantas, 2021). Micro-credentials for discrete competencies and capstones tied to local MSMEs evidence mastery. Locally grounded cases and public-sector contexts keep content relevant to Nigerian markets and regulatory realities.

Policy and Governance: Institutional governance translates national aspirations, such as NDEPS, into practice (Federal Ministry of Communications and Digital Economy, 2020). Each institution should publish an ICT strategy with budgets, roles, timelines, cybersecurity and data-protection protocols, procurement standards, and measurable indicators (Offiong, Caleb, & Effiong, 2019). A standing ed-tech steering committee can coordinate policy, approve platforms, and enforce interoperability. Performance dashboards, periodic audits, and user-feedback loops enable adaptive management and accountability across departments and campuses.

Equity and Inclusivity: Integration must close, not widen, digital divides. Policies should provide subsidised devices and data, device-lending schemes, and accessible computer hubs, alongside platforms built to universal-design standards—captioning, screen readers, alt-text, and adjustable fonts (Jiboye, Adeleke, & Akintunde, 2023). Gender-responsive outreach, mentoring, and safe study spaces can raise participation by women and other under-represented groups. Rural learners benefit from community access points and offline-first content. Monitoring disaggregated access and outcome data keeps inclusion central to decision-making.

Stakeholder Partnerships: Sustained integration requires coalitions. Industry, NGOs, government agencies, and professional bodies such as ABEN can co-design curricula, sponsor labs, offer internships, and supply current market briefs (Onokpaunu & Okonkwo, 2021). Formal MOUs with clear deliverables and timelines, plus active advisory boards, align training with labour-market needs. Hackathons, living-lab sandboxes, and student co-creation in pilots improve usability and adoption. Partnerships diversify funding, unlock in-kind software licences, and support local vendor ecosystems to keep programmes resilient to shocks.

The Six Pillars Framework at a Glance

The Six-Pillar Framework underscores that integrating technology into business and entrepreneurship education (BEE) is not a singular intervention but a systemic process requiring deliberate planning and sustained commitment. Evidence from recent studies shows that institutions that align infrastructure, faculty development, curricula, and governance with digital transformation strategies achieve stronger educational outcomes than those that adopt fragmented approaches (Adeboye, 2020; Dabbagh & Kitsantas, 2021).

Faculty readiness remains a decisive factor. Even when infrastructure and digital platforms are available, ineffective use by educators undermines impact (Timya, Nwosu, & Mbeazie, 2019). This highlights the need for structured professional development and ongoing communities of practice. Similarly, curriculum reform is indispensable, as traditional teaching methods often fail to prepare learners for the digital workplace (Nwaokokorom & Ikpeama, 2023). Embedding

simulations, data analytics, and e-commerce projects ensures that graduates acquire both theoretical knowledge and applied digital competencies.

The framework also emphasizes inclusivity, recognizing that technology integration can deepen inequalities if marginalized learners are excluded. Providing affordable access, universal design, and gender-responsive initiatives is therefore crucial (Jiboye, Adeleke, & Akintunde, 2023). Furthermore, stakeholder partnerships offer essential resources, expertise, and relevance, ensuring that curricula remain aligned with labour market needs (Onokpaunu & Okonkwo, 2021).

In essence, the Six-Pillar Framework advances a holistic perspective that bridges the gap between national policy aspirations and institutional realities. By prioritizing infrastructure, people, and governance simultaneously, it repositions BEE as a catalyst for innovation, employability, and inclusive growth in Nigeria's evolving digital economy.

Implications for Practice

The Six-Pillar Framework has important implications for educators, policymakers, and administrators seeking to strengthen business and entrepreneurship education (BEE) in Nigeria and similar contexts. First, the framework emphasizes the need for **strategic alignment**. Institutions must treat technology integration as part of their core mission rather than as an add-on project. Embedding ICT strategies within institutional development plans ensures continuity and accountability (Federal Ministry of Communications and Digital Economy, 2020).

Second, the framework highlights **faculty empowerment** as central to success. Educators require sustained professional development opportunities, incentives, and recognition for digital innovation in teaching (Timya, Nwosu, & Mbeazie, 2019). Without this, investments in infrastructure risk underutilization.

Third, **inclusion must be intentional**. Administrators should provide subsidized devices and data support, while ensuring digital platforms are accessible to learners with disabilities and sensitive to gender disparities (Jiboye, Adeleke, & Akintunde, 2023).

Fourth, **stakeholder partnerships** offer practical solutions to resource gaps. Collaborations with technology firms, industry partners, and professional associations such as ABEN can provide funding, expertise, and curriculum input, thereby improving relevance and sustainability (Onokpaunu & Okonkwo, 2021).

Finally, **continuous evaluation** of technology adoption and learning outcomes is critical. Institutions should establish clear metrics to measure progress, ensure accountability, and guide iterative improvements (Adeboye, 2020).

Suggestions

Based on the Six-Pillar Framework, the following recommendations are proposed to ensure sustainable technology integration in business and entrepreneurship education (BEE):

1. Institutions should prioritize reliable infrastructure by ensuring stable electricity, providing modern ICT laboratories, and negotiating affordable broadband access.
2. Faculty members should undergo continuous professional development, including digital literacy certification and practical training, to confidently integrate technology into their teaching.
3. Curricula should be redesigned to embed digital competencies such as data analytics, e-commerce, simulations, and locally relevant case studies that reflect Nigeria's business environment.
4. Institutional policies should include clear ICT strategies, budget allocations, cybersecurity protocols, and monitoring systems to guarantee sustainable implementation.

5. Equity should be promoted by providing subsidized devices, affordable data support, and accessible platforms to meet the needs of disadvantaged learners, women, and persons with disabilities.
6. Strong partnerships with industry, government agencies, NGOs, and professional associations should be established to secure resources, strengthen curricula, and ensure alignment with labour market needs.

Conclusion

Technology integration in business and entrepreneurship education is essential for preparing graduates to thrive in the digital economy. The proposed Six-Pillar Framework emphasizes infrastructure, faculty development, curriculum innovation, governance, equity, and partnerships as the foundation for sustainable reform. By adopting these interrelated strategies, institutions can close gaps between policy aspirations and institutional realities, foster inclusivity, and equip learners with digital competencies for employability and entrepreneurship. Ultimately, business education can be repositioned as a catalyst for innovation, self-reliance, and national development in Nigeria's evolving digital landscape.

References

Adeboye, N. A. (2020). Strategies for the integration of technology into business and entrepreneurship education. *Nigerian Journal of Business Education, 7*(1), 162–172.

Binuomote, M. O., Igu, O. F., & Eze, M. I. (2022). E-commerce skills required by business education students in Nigeria. *Tertiary Education Journal of Vocational Education, 8*(1), 55–67.

Dabbagh, N., & Kitsantas, A. (2021). Online and blended entrepreneurship education: A systematic review of instructional design and pedagogical strategies. *Entrepreneurship Education, 8*(2), 115–134. https://doi.org/10.1007/s41959-021-00047-7

Federal Ministry of Communications and Digital Economy. (2020). *National digital economy policy and strategy (2020–2030).* Abuja, Nigeria: Author.

Fryer, L. K., Nakao, K., & Thompson, A. (2019). Chatbot learning partners: Connecting learning experiences, interest, and competence. *Computers in Human Behavior, 93,* 279–289. https://doi.org/10.1016/j.chb.2018.12.023

Ile, C. M., Udegbunam, E. O., & Odimmega, C. G. (2019). Challenges of integrating new technologies in business education programmes. *Education Journal, 4*(6), 9–15.

Jiboye, T. F., Adeleke, B., & Akintunde, O. (2023). Enhancing entrepreneurship education for women with special needs through inclusive technologies. *International Journal of Contemporary Issues in Education, 5*(1), 33–48.

Nwaokokorom, O. W. (2023). *Employability skills required of business education students in colleges of education for job performance in organisations in Rivers State* [Master's thesis, Michael Okpara University of Agriculture, Umudike]. MOUAU Institutional Repository. https://repository.mouau.edu.ng

Nwaokokorom, O. W., & Ikpeama, F. U. (2023). Accounting and problem-solving skills required of business education students in colleges of education in a digital era. *Nigerian Journal of Business Education, 10*(1), 99–110.

Nwokike, P. O., & Chukwuma, J. N. (2019). Integration of new technologies in teaching business education courses in universities. *Nigerian Journal of Business Education, 6*(1), 206–214.

Offiong, M. A., Caleb, E. E., & Effiong, A. A. (2019). Strategies for integrating ICT in entrepreneurial education. *Nigerian Journal of Business Education, 6*(1), 181–195.

Onokpaunu, M. O., & Okonkwo, M. U. (2021). Integration of web-based learning in business education. *Nigerian Journal of Business Education, 8*(1), 207–220.

Onojetah, S. O., & Ulowore, J. D. A. (2019). Challenges and strategies for new technologies application in business education. *Nigerian Journal of Business Education, 6*(1), 265–274.

Timya, M. A., Nwosu, B. O., & Mbeazie, A. D. (2019). Teachers' capacity for utilization of digital resources in business education. *Association of Business Educators of Nigeria (ABEN) Conference Proceedings, 5*(1), 103–112.

Val, M. U., & Akpomi, M. E. (2019). Entrepreneurship education and empowering 21st-century business education students for employment. *Rivers Business Education Journal, 2*(1), 12–21.

Zango, A. U., & Mahmoud, A. S. (2022). Technology-mediated instruction and academic performance in entrepreneurship education. *Nigerian Journal of Business Education, 8*(2), 55–70.

Zhu, J., & Luo, L. (2025). AI-empowered scaffolding systems for business plan development. *arXiv.* https://arxiv.org/abs/2505.23326