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TECHNOLOGICAL AND ENTREPRENEURIAL COMPETENCIES REQUIRED OF BUSINESS EDUCATION GRADUATES OF COLLEGES OF EDUCATION FOR SUSTAINABLE EMPLOYABILITY IN NORTH-EAST NIGERIA

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ABSTRACT

This study investigated the technological and entrepreneurial competencies required of Business Education graduates of Colleges of Education for sustainable employability in North-East Nigeria. Persistent graduate unemployment and a widening mismatch between curricular content and labour-market demands provided the impetus for the inquiry. Two research questions and two null hypotheses guided the study, which adopted a descriptive survey design. The population comprised Business Education graduates and their employers across the six states of the North-East geopolitical zone. A structured questionnaire, validated by experts and yielding a Cronbach's alpha reliability coefficient of 0.86, was used for data collection. Mean and standard deviation answered the research questions, while the independent-samples t-test tested the hypotheses at the 0.05 level of significance. Findings revealed that both technological competencies (such as digital literacy, spreadsheet and database handling, and e-business operations) and entrepreneurial competencies (such as opportunity recognition, business planning, and risk management) were highly required for sustainable employability. The t-test results showed no significant difference between the mean responses of graduates and employers on the competencies required. The study concluded that integrating these competencies into the Business Education curriculum is indispensable for sustainable employability. It recommended curriculum review, capacity building for lecturers, and stronger industry partnerships.

\KEYWORDS: Technological competencies; Entrepreneurial competencies; Business Education; Sustainable employability; North-East Nigeria

INTRODUCTION

Business Education is a vocationally oriented programme that prepares recipients for paid employment, self-employment and effective participation in the world of work. In Nigeria, Colleges of Education situated in the North-East geopolitical zone are mandated to produce

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competent middle-level personnel capable of teaching business subjects and engaging productively in economic activities. However, the rapidly changing nature of work, driven by digitalisation and the Fourth Industrial Revolution, has reshaped the competencies that employers and labour markets now expect of graduates. Sustainable employability, the capacity of a graduate to gain, retain and progress in decent work over the long term, has therefore become a central concern for educators, policymakers and employers alike. The contemporary workplace is increasingly defined by technology. Employers expect graduates to demonstrate fluency in digital tools, data handling, electronic communication and emerging enterprise applications. At the same time, the persistently high rate of graduate unemployment in Nigeria has shifted attention toward entrepreneurial competencies that enable graduates to create rather than merely seek jobs. The North-East zone, comprising Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe states, faces peculiar socio-economic challenges, including the lingering effects of insurgency, infrastructural deficits and a fragile labour market, which intensify the need for graduates who are both technologically equipped and entrepreneurially agile. Despite the rich vocational orientation of the Business Education curriculum, concerns persist that many graduates leave Colleges of Education without the practical competencies demanded by present-day employers. The gap between what is taught and what the labour market requires undermines the employability and self-reliance objectives of the programme. Consequently, identifying the specific technological and entrepreneurial competencies required for sustainable employability, and ascertaining whether graduates and employers share a common view of these competencies, is essential for evidence-based curriculum reform. Grounded in Human Capital Theory and Social Cognitive Career Theory, this study positions competencies as investments that enhance graduate productivity and self-efficacy in the workplace. By comparing the perceptions of graduates with those of employers, the study seeks to determine whether the two key stakeholder groups agree on the competencies that matter most. Such convergence, or its absence, has direct implications for how Business Education is designed and delivered in the zone. Accordingly, this study examines the technological and entrepreneurial competencies required of Business Education graduates of Colleges of Education for sustainable employability in North-East Nigeria. The outcomes are expected to inform curriculum planners, the National Commission for Colleges of Education, lecturers and employers on the competency priorities that will strengthen the employability and self-reliance of graduates in a digitally driven and entrepreneurially competitive economy.

1.1 Statement of the Problem

Graduate unemployment in Nigeria has assumed worrying dimensions, and Business Education graduates are not exempt. Although the programme is designed to instil employable and self-reliance skills, evidence suggests that many graduates of Colleges of Education in North-East Nigeria struggle to secure or retain decent work, and an appreciable number remain unable to establish viable enterprises. This situation persists despite the vocational orientation of the curriculum, raising fundamental questions about the relevance of the competencies that graduates acquire. Two competency domains appear especially critical yet under-emphasised. First, technological competencies have become indispensable as workplaces digitalise, but graduates frequently lack adequate exposure to digital tools, data handling and e-business

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operations. Second, entrepreneurial competencies, which would enable graduates to create jobs and become self-reliant, are often taught theoretically rather than developed practically. Where these competencies are weak, sustainable employability is compromised. Furthermore, curriculum reform tends to proceed without systematically comparing the views of graduates, who experience the labour market directly, with those of employers, who define workplace expectations. If the two groups differ markedly on the competencies that matter, interventions may be misdirected; if they agree, there is a strong evidentiary basis for reform. The problem of this study, therefore, is to determine the technological and entrepreneurial competencies required for sustainable employability and to ascertain whether graduates and employers differ significantly in their perceptions of these competencies in North-East Nigeria.

1.2 Purpose of the Study

The main purpose of this study was to investigate the technological and entrepreneurial competencies required of Business Education graduates of Colleges of Education for sustainable employability in North-East Nigeria. Specifically, the study sought to:

1. Determine the technological competencies required of Business Education graduates of Colleges of Education for sustainable employability in North-East Nigeria; and
2. Determine the entrepreneurial competencies required of Business Education graduates of Colleges of Education for sustainable employability in North-East Nigeria.

1.3 Research Questions

The following research questions guided the study:

1. What are the technological competencies required of Business Education graduates of Colleges of Education for sustainable employability in North-East Nigeria?
2. What are the entrepreneurial competencies required of Business Education graduates of Colleges of Education for sustainable employability in North-East Nigeria?

1.4 Research Hypotheses

The following null hypotheses were tested at the 0.05 level of significance:

HO_1: There is no significant difference between the mean responses of graduates and employers on the technological competencies required of Business Education graduates of Colleges of Education for sustainable employability in North-East Nigeria.

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HO_2: There is no significant difference between the mean responses of graduates and employers on the entrepreneurial competencies required of Business Education graduates of Colleges of Education for sustainable employability in North-East Nigeria.

2. Literature Review

This section reviews relevant literature under three broad strands: the conceptual framework, the theoretical framework and related empirical studies. The review synthesises current scholarship to situate the present study within ongoing debates on graduate competencies and sustainable employability, particularly in developing-economy contexts such as Nigeria.

2.1 Conceptual Framework

2.1.1 Concept of Business Education

Business Education is a programme of instruction that equips learners with knowledge, attitudes and skills required for effective performance in business occupations and for intelligent participation in economic life. It is dual in orientation: it prepares individuals for teaching business subjects and for direct engagement in commercial and entrepreneurial activities. Scholars increasingly describe Business Education as a vehicle for producing competent, knowledgeable and self-reliant graduates who can compete favourably in a dynamic work environment and create employment for themselves and others. In Colleges of Education, the programme is structured to produce middle-level manpower whose competencies should reflect the realities of a digitalised and entrepreneurial economy. Contemporary discourse positions Business Education as a discipline that must continuously evolve to remain relevant. The curriculum is expected to move beyond preparing learners for narrow employment opportunities toward empowering them as active, responsible and economically engaged citizens. This repositioning implies that competencies once regarded as supplementary, such as digital fluency and entrepreneurial agility, are now core to the programme's mission. Where the curriculum fails to integrate these competencies, graduates risk being classified as unemployable or insufficiently self-reliant. In the Nigerian context, Business Education at the Colleges of Education level is regulated by the Benchmark Minimum Academic Standards, which prescribe the broad knowledge and skills graduates should possess. Scholars argue, however, that these benchmarks have not kept pace with the velocity of technological and economic change, leaving a structural lag between prescribed content and labour-market reality. The programme's twin mandate, to prepare teachers of business subjects and to cultivate self-reliant economic actors, places it at the heart of national human-capital development. Consequently, the quality of Business Education is increasingly judged not merely by examination outcomes but by the demonstrable employability and enterprise capacity of its graduates. This outcome-oriented view frames the present study's focus on the specific competencies that translate training into work.

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2.1.2 Concept of Competency

Competency refers to the integrated cluster of knowledge, skills, attitudes and abilities that enables an individual to perform tasks effectively and to defined standards. In the employability literature, competencies are conceptualised as observable and measurable behaviours that combine cognitive, technical and affective dimensions. A competency is therefore more than the possession of knowledge; it is the demonstrated capacity to apply that knowledge to achieve results in real work settings. This applied dimension is central to vocational programmes such as Business Education, where the value of learning is judged by its translation into workplace performance and enterprise creation. Competencies are frequently classified into technical, behavioural and contextual categories. Technical competencies relate to job-specific tools and procedures; behavioural competencies encompass interpersonal and self-management attributes; and contextual competencies concern the ability to operate within particular organisational and economic environments. For Business Education graduates, technological and entrepreneurial competencies sit at the intersection of these categories, blending technical mastery with behavioural agility and contextual awareness. The present study focuses on these two domains because they are widely identified as decisive for employability in the digital and enterprise-driven economy. The competency construct also underpins the global shift toward competency-based education and training, in which learning outcomes are defined in terms of what graduates can do rather than what they have been taught. This paradigm has gained traction in vocational education because it aligns instruction with measurable workplace performance. Within Business Education, a competency-based orientation requires that technological and entrepreneurial abilities be taught, practised and assessed authentically, rather than examined only at the level of recall. The literature cautions that without such authentic assessment, declared competencies may remain inert knowledge that does not convert into employability. This concern directly motivates the present study's attempt to identify, from the perspectives of those closest to the labour market, the competencies that genuinely matter.

2.1.3 Technological Competencies

Technological competencies denote the abilities required to use digital tools, systems and platforms productively in the workplace. They include digital literacy, proficiency in office productivity applications, data capture and analysis, the use of databases and spreadsheets, electronic communication, e-business and e-commerce operations, online research, cybersecurity awareness and the use of emerging tools such as cloud services and artificial-intelligence-assisted applications. As enterprises digitalise their operations, these competencies have shifted from being desirable extras to baseline requirements for employability. Within the Nigerian Business Education context, several authors lament a persistent digital divide. Studies report that business educators frequently utilise e-learning and digital technologies to a low extent, with the result that graduates emerge with limited practical exposure to the tools that employers expect them to command. This shortfall is attributed to inadequate digital infrastructure, insufficient digital competencies among lecturers, and limited student exposure to digital resources during training. The consequence is a visible digital gap among graduates that undermines their self-employability in the twenty-first-century business world. Recent

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scholarship frames digital and technological competence as fluency in data analytics, enterprise software, e-commerce and increasingly artificial-intelligence tools. Such competence is consistently identified as a determinant of both graduate employability and organisational success. For graduates in resource-constrained regions such as North-East Nigeria, the acquisition of technological competencies is doubly important: it enables participation in formal digital workplaces and, equally, supports the operation of small digitally enabled enterprises where formal jobs are scarce. The technological domain therefore constitutes a strategic lever for sustainable employability.

To bridge the technological gap, scholars recommend strategies such as institution-community partnerships, digital-resource development funds, and sustained professional development of lecturers in digital competencies. These interventions seek to expose both educators and students to digital devices and content development on a mentor-mentee basis, thereby embedding technological competence within the everyday practice of the programme. The present study contributes to this conversation by establishing, from the perspectives of graduates and employers, which technological competencies are most required for sustainable employability in the zone. It is also instructive that technological competence is increasingly understood as dynamic rather than static. The tools that define digital fluency today, including cloud-based collaboration platforms, mobile commerce applications and artificial-intelligence assistants, differ markedly from those of a decade ago, and they will continue to change. This implies that the most durable technological competency is the capacity to learn and adapt to new tools, a meta-competence sometimes described as digital adaptability. For Business Education graduates, cultivating this adaptive disposition is arguably as important as mastering any particular application, because it sustains employability across successive waves of technological change. The framing of technological competence as both tool-specific and adaptive informs the range of items examined in this study.

2.1.4 Entrepreneurial Competencies

Entrepreneurial competencies are the knowledge, skills and personal attributes that enable an individual to identify opportunities, mobilise resources, create value and manage a sustainable enterprise. They encompass opportunity recognition, creativity and innovation, risk assessment and management, business planning, financial literacy and record keeping, marketing and customer relations, networking, resilience and the determination to pursue goals under uncertainty. For Business Education graduates, these competencies are central to the programme's self-reliance objective, particularly where formal wage employment is limited. A recurring theme in the literature is the gap between entrepreneurial knowledge and entrepreneurial action. Several Nigerian studies observe that, despite acquiring knowledge in entrepreneurship education, many Business Education graduates do not become self-employed. This is partly attributed to instruction that emphasises theory over practice, inadequate exposure to real enterprise environments, and the absence of structured mentorship. Researchers consequently call for a joint curriculum that fuses entrepreneurial, innovative and technical skills, and for closer alignment between institutional entrepreneurship centres and the training process.

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Contemporary frameworks describe entrepreneurial agility, the creative thinking and innovativeness required to launch ventures or drive intra-organisational projects, as a core employability competency for the future of work. Within this view, entrepreneurial competence is not confined to founding a business; it also enhances employability within organisations by enabling graduates to add value, solve problems and adapt to change. This dual benefit makes entrepreneurial competencies especially pertinent to sustainable employability, which embraces both wage employment and self-employment. Empirical work on strategic and leadership dimensions of entrepreneurship has further highlighted competencies such as evaluation of solutions, long-term planning, effective communication, team management and emotional intelligence as vital for graduate employability. These findings reinforce the position that entrepreneurial competence is multidimensional, combining cognitive, strategic and affective elements. The present study extends this body of work by examining entrepreneurial competencies specifically among Colleges of Education graduates in North-East Nigeria and by comparing the perceptions of graduates and employers. The North-East context lends particular urgency to entrepreneurial competence. Where formal employment opportunities are scarce and the economy is dominated by micro and small enterprises, the ability to create and sustain a business becomes a primary route to livelihood. Entrepreneurial competencies such as financial literacy, record keeping and customer relations are therefore not abstract attributes but practical survival skills for graduates in the zone. Moreover, entrepreneurship is increasingly linked to community resilience and post-conflict recovery, since locally generated enterprises rebuild economic activity and create employment for others. Viewed through this lens, the cultivation of entrepreneurial competencies among Business Education graduates carries developmental significance beyond the individual graduate, reinforcing the rationale for its prominence in this study.

2.1.5 Sustainable Employability

Sustainable employability refers to the enduring capacity of an individual to obtain, maintain and progress in decent work throughout a changing career, while also retaining the option of self-employment. Unlike narrow conceptions of employability that focus on initial job placement, the sustainable perspective emphasises adaptability, continuous learning and the ability to remain productive amid technological and economic change. It therefore integrates the acquisition of competencies with their ongoing renewal. For graduates in North-East Nigeria, sustainable employability is shaped by a fragile labour market, infrastructural constraints and the socio-economic aftermath of insecurity. In such an environment, employability cannot rest solely on the availability of formal jobs; it must also encompass the capacity to create work through enterprise. This reality elevates the combined importance of technological and entrepreneurial competencies, which together enable graduates to function in formal digital workplaces and to establish resilient small enterprises. The conceptual framework guiding this study, presented in Figure 1, depicts these two competency domains converging on the graduate and translating, through stakeholder-validated perceptions, into sustainable employability. The sustainability dimension further implies a temporal and developmental quality that distinguishes it from short-term job acquisition. A graduate may secure initial employment yet fail to retain it if competencies are not continually updated, just

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as an enterprise may be founded yet collapse without sound management. Sustainable employability therefore embraces job retention, career progression and enterprise survival, all of which depend on the renewal of competencies over time. This understanding aligns with global frameworks that link decent work to lifelong learning and adaptability. By situating technological and entrepreneurial competencies within this sustainability frame, the present study moves beyond a static checklist of skills toward a view of competencies as evolving investments that secure graduates' livelihoods across a changing career.

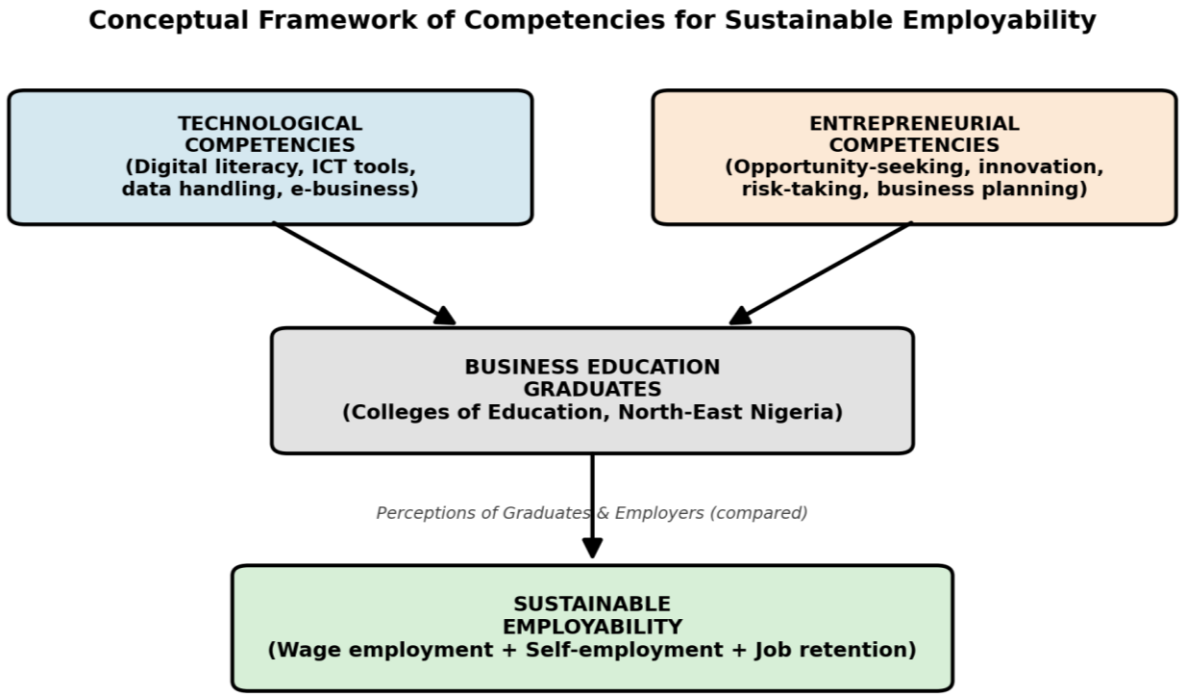

Figure 1: Conceptual Framework of the Study **Source:** *Authors' conceptualisation (2026), adapted from Human Capital Theory (Becker, 1964) and Social Cognitive Career Theory (Bandura, 1986).*

Figure 1 illustrates that technological and entrepreneurial competencies serve as the two independent competency inputs which Business Education graduates of Colleges of Education in North-East Nigeria must acquire. These competencies are filtered through the comparative perceptions of graduates and employers and ultimately translate into sustainable employability, conceived as a composite of wage employment, self-employment and job retention. The framework thus links competency acquisition directly to long-term labour-market outcomes.

2.2 Theoretical Framework

This study is anchored on two complementary theories: Human Capital Theory and Social Cognitive Career Theory. Together, they explain both why competencies matter for employability and how individuals develop the confidence to apply them.

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2.2.1 Human Capital Theory (Becker, 1964)

Human Capital Theory, propounded by Gary Becker in 1964 and rooted in the earlier work of Schultz, holds that education and training are investments that enhance an individual's productivity and, by extension, employability and earnings. The theory conceives knowledge and skills as durable assets that increase the value an individual can offer to employers and to the economy. Applied to Business Education, the theory implies that technological and entrepreneurial competencies are forms of human capital whose acquisition raises the productive capacity and labour-market value of graduates. The relevance of Human Capital Theory to the present study lies in its central claim that targeted investment in competencies yields returns in employability and productivity. If Business Education graduates acquire the technological and entrepreneurial competencies demanded by the labour market, the theory predicts improved employment outcomes and greater capacity for self-reliance. Critics note that the theory may understate structural barriers in the labour market; nonetheless, its emphasis on competency investment provides a robust rationale for examining which competencies most enhance sustainable employability.

2.2.2 Social Cognitive Career Theory (Lent, Brown & Hackett, 1994)

Social Cognitive Career Theory (SCCT), developed from Bandura's social cognitive theory by Lent, Brown and Hackett, explains career development through the dynamic interaction of personal attributes, environmental factors and observable behaviours. Central to the theory are the constructs of self-efficacy and outcome expectations, which shape the interests individuals pursue and the persistence they exhibit. In the context of competencies, SCCT suggests that graduates who develop both the ability and the belief in their ability to deploy technological and entrepreneurial skills are more likely to act on employment and enterprise opportunities. SCCT complements Human Capital Theory by addressing the behavioural and motivational dimensions of competency use. Whereas Human Capital Theory explains why competencies enhance employability, SCCT explains how confidence in those competencies translates into career action, including the decision to pursue self-employment. The theory's triadic, reciprocal model is particularly apposite for North-East Nigeria, where environmental constraints interact with personal agency to shape employment outcomes. By drawing on both theories, the study captures both the supply of competencies and the self-efficacy required to apply them.

2.3 Related Empirical Studies

A growing body of empirical research has examined the competencies required for graduate employability in Nigeria and beyond. The studies reviewed below are organised thematically around technological competencies, entrepreneurial competencies and stakeholder perceptions, with attention to their methods, findings and limitations.

2.3.1 Studies on Technological Competencies

Research on the digitalisation of skills acquisition has consistently linked technological competence to the employability of Business Education graduates. Studies conducted in

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Nigerian tertiary institutions report that the integration of digital technologies into teaching and learning significantly enhances graduates' readiness for contemporary workplaces, but that adoption remains uneven. A recurrent finding is that business educators utilise e-learning digital technologies to a low extent, producing a digital divide that constrains graduates' self-employability. These studies recommend deliberate strategies, including institution-community partnerships and lecturer professional development, to close the gap.

Comparative analyses of employer expectations reinforce these conclusions. Investigations into the employability skills perceived by employers in Nigerian industries identify analysing and documenting data, optimising processes, and troubleshooting and maintaining devices as competencies aligned with the demands of the Fourth Industrial Revolution. Employers in these studies generally agree that such technological competencies are relevant and necessary, and that their absence diminishes graduate readiness. The convergence of employer views across sectors lends weight to the argument that technological competence is now a baseline employability requirement.

Beyond Nigeria, tracer and competency studies report similar patterns. Graduates are found to master some technical competencies, such as teamwork and ethics, more readily than others, with data handling and process optimisation frequently identified as areas needing improvement. These findings suggest that, while technological exposure has increased, the depth of competence often falls short of employer expectations. The present study builds on this literature by isolating the specific technological competencies most required for sustainable employability in a defined regional context.

2.3.2 Studies on Entrepreneurial Competencies

Empirical inquiries into entrepreneurial competencies among Business Education graduates reveal a persistent paradox: graduates acquire entrepreneurial knowledge yet frequently fail to become self-employed. Studies in southern Nigerian states report that entrepreneurship skill acquisition in Business Education involves the mastery and development of talents in areas such as creativity, determination, competitiveness and applied knowledge, but that translation into venture creation remains weak. Researchers attribute this to curricula that privilege theory over practice and recommend a joint curriculum integrating entrepreneurial, innovative and technical skills.

Other investigations assessing the entrepreneurial skills needed for self-employment by Business Education graduates affirm that such skills are highly relevant for sustainable development and self-reliance. These studies typically employ descriptive survey designs, use mean and standard deviation to answer research questions, and test hypotheses with analysis of variance or t-tests at the 0.05 level of significance, a methodological pattern mirrored in the present study. Their findings consistently indicate that respondents regard entrepreneurial competencies as essential, while recommending stronger linkages between institutions and enterprise centres.

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More recent work on strategic thinking and leadership competencies among Business Education students identifies evaluation of solutions, long-term planning, effective communication, team management and emotional intelligence as critical for employability. Notably, several of these studies report no significant difference in respondent perceptions across demographic groups such as gender, a result that resonates with the comparative orientation of the present study. Collectively, this literature establishes entrepreneurial competence as a multidimensional and indispensable contributor to graduate employability and self-reliance.

2.3.3 Studies Comparing Graduate and Employer Perceptions

A distinctive feature of the present study is its comparison of graduate and employer perceptions. The wider literature on graduate employability frameworks emphasises that employers are key stakeholders whose expectations shape labour-market outcomes, and that alignment between graduate self-perceptions and employer requirements is critical for successful transition into work. Studies that juxtapose these perspectives often find broad agreement on the importance of core competencies, with divergence appearing mainly in the perceived adequacy of graduate preparation rather than in the competencies themselves.

Bridging-the-skill-gap analyses in Nigeria converge on a shared set of competencies, including digital and technological competence, critical thinking and problem-solving, emotional intelligence and teamwork, sustainability literacy and entrepreneurial agility, as decisive for graduate employability and organisational success. The consensus across employer-focused and graduate-focused studies suggests that the two groups largely agree on what competencies matter, even as they may differ on how well graduates currently possess them. This pattern provides the empirical backdrop against which the present study's hypotheses, which predict no significant difference between graduate and employer perceptions, are examined.

Despite the breadth of existing research, few studies have simultaneously examined technological and entrepreneurial competencies for sustainable employability within the specific context of Colleges of Education in North-East Nigeria, while comparing graduate and employer perceptions. This gap, in content, geographical scope and unit of analysis, justifies the present inquiry and positions it as a contribution to both the regional and disciplinary literature.

A further observation from the comparative literature is that divergence between stakeholders, where it occurs, tends to concentrate on soft and emerging competencies rather than on established technical ones. Employers sometimes rate behavioural attributes such as communication, adaptability and emotional intelligence more highly than graduates do, while graduates may overestimate their own readiness. This asymmetry, often termed the perception gap, has implications for how feedback loops between institutions and industry are designed. The present study tests whether such a gap exists for technological and entrepreneurial competencies in the study area; a finding of no significant difference would indicate a mature, shared understanding of competency requirements, whereas a significant difference would

signal the need for closer institution-industry dialogue. Either outcome offers actionable guidance for curriculum stakeholders.

2.4 Summary of Literature and Gap

The reviewed literature establishes that technological and entrepreneurial competencies are central to graduate employability in a digitalising and enterprise-driven economy. It also reveals persistent shortfalls in the practical acquisition of these competencies by Business Education graduates, alongside broad stakeholder agreement on their importance. However, the literature is dominated by studies conducted in southern and central Nigeria, with limited attention to the North-East zone and to the comparative perceptions of graduates and employers within Colleges of Education. The present study addresses this gap by determining the required competencies and testing whether graduates and employers differ significantly in their perceptions, thereby providing a robust basis for curriculum reform tailored to the realities of the zone.

In addition to its geographical contribution, the study advances the literature methodologically by treating graduates and employers as parallel respondent groups whose perceptions are statistically compared, rather than surveying a single stakeholder group as is common in prior work. This dual-stakeholder design responds to repeated calls in the employability literature for studies that triangulate supply-side and demand-side views of competence. By integrating Human Capital Theory and Social Cognitive Career Theory, the study also bridges the often-separate economic and psychological traditions in employability research, offering a more complete account of how competencies are valued and enacted. These conceptual and methodological features distinguish the present inquiry from the existing body of regional and disciplinary scholarship.

3. Research Methodology

3.1 Research Design

The study adopted a descriptive survey research design. This design was considered appropriate because it enables the systematic collection of data on respondents' opinions concerning the competencies required for sustainable employability, and it permits comparison of the perceptions of two stakeholder groups, graduates and employers, without manipulation of variables.

3.2 Area of the Study

The study was conducted in the North-East geopolitical zone of Nigeria, which comprises six states: Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe. The zone was selected because of its peculiar socio-economic profile, including a fragile labour market and the developmental challenges arising from years of insecurity, which heighten the relevance of competencies that support both wage employment and self-employment.

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3.3 Population of the Study

The population comprised Business Education graduates of Colleges of Education in the six states of the zone, together with employers of labour in business-related establishments who engage such graduates. Both groups were included to enable the comparative analysis central to the study's hypotheses. The illustrative population and sample figures presented in Table 1 reflect a typical distribution across the zone for studies of this nature.

Table 1: Population and Sample Distribution by Respondent Group

Respondent Group	Population	Sample	% of Sample
Business Education graduates	612	240	60.0
Employers of labour	388	160	40.0
Total	**1,000**	**400**	**100.0**

Source: Field survey (2026).

3.4 Sample and Sampling Technique

A sample of 400 respondents, comprising 240 graduates and 160 employers, was drawn using a multi-stage sampling procedure. In the first stage, the six states constituted natural clusters. In the second stage, proportionate stratified random sampling was used to select respondents from each state, ensuring representation of both graduates and employers. This procedure enhanced the representativeness of the sample and supported valid comparison between the two groups.

3.5 Instrument for Data Collection

Data were collected using a structured questionnaire titled the Technological and Entrepreneurial Competencies for Sustainable Employability Questionnaire (TECSEQ). The instrument was organised in three parts: respondents' background information, technological competency items and entrepreneurial competency items. Items were scaled on a four-point response format of Highly Required (4), Required (3), Slightly Required (2) and Not Required (1), with a criterion mean of 2.50 adopted as the benchmark for decision-making.

3.6 Validity and Reliability of the Instrument

The instrument was subjected to face and content validation by three experts drawn from Business Education and Measurement and Evaluation. Their observations were used to refine the clarity and relevance of the items. To establish reliability, the instrument was trial-tested on a comparable group outside the study area, and the data obtained were analysed using Cronbach's alpha. A reliability coefficient of 0.86 was obtained, indicating that the instrument was reliable for the study.

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3.7 Method of Data Collection and Analysis

The questionnaire was administered to respondents with the assistance of trained research aides, and a high return rate was achieved through follow-up. Data were analysed using descriptive and inferential statistics. Mean and standard deviation were used to answer the research questions, while the independent-samples t-test was used to test the null hypotheses at the 0.05 level of significance. A mean of 2.50 and above indicated that a competency was required, while a mean below 2.50 indicated otherwise. For the hypotheses, the null hypothesis was rejected where the calculated probability value was less than 0.05 and retained where it was equal to or greater than 0.05.

4. Results and Discussion

4.1 Answering the Research Questions

Research Question One: What are the technological competencies required of Business Education graduates for sustainable employability? Table 2 presents the mean ratings and standard deviations of graduates and employers on the technological competencies required for sustainable employability.

Table 2: Mean Ratings on Technological Competencies Required (N = 400)

Technological Competency Item	Graduates Mean	Employers Mean	Grand Mean	Decision
1. Digital literacy and computer operation	3.58	3.64	3.61	Highly Required
2. Use of spreadsheets for business data	3.49	3.55	3.52	Highly Required
3. Database creation and management	3.31	3.40	3.36	Required
4. E-business and e-commerce operations	3.46	3.51	3.49	Required
5. Electronic communication and collaboration	3.62	3.59	3.61	Highly Required
6. Online research and information retrieval	3.40	3.44	3.42	Required
7. Cybersecurity and data-protection awareness	3.27	3.33	3.30	Required
Cluster Mean	**3.45**	**3.49**	**3.47**	**Required**

Source: Field survey (2026). Criterion mean = 2.50.

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Table 2 shows that all seven technological competency items recorded grand means above the 2.50 criterion, ranging from 3.30 to 3.61, with a cluster mean of 3.47. This indicates that respondents regarded every listed technological competency as required for sustainable employability. Electronic communication and collaboration and digital literacy and computer operation attracted the highest ratings, while cybersecurity awareness, though still above criterion, recorded the lowest. The closeness of the graduate and employer means within each item suggests broad agreement between the two groups.

Research Question Two: What are the entrepreneurial competencies required of Business Education graduates for sustainable employability? Table 3 presents the mean ratings and standard deviations of the two groups on the entrepreneurial competencies required for sustainable employability.

Table 3: Mean Ratings on Entrepreneurial Competencies Required (N = 400)

Entrepreneurial Competency Item	Graduates Mean	Employers Mean	Grand Mean	Decision
1. Opportunity recognition and idea generation	3.55	3.60	3.58	Highly Required
2. Business planning and feasibility analysis	3.48	3.52	3.50	Highly Required
3. Financial literacy and record keeping	3.51	3.57	3.54	Highly Required
4. Risk assessment and management	3.33	3.38	3.36	Required
5. Marketing and customer relations	3.44	3.47	3.46	Required
6. Innovation and creative problem-solving	3.39	3.43	3.41	Required
7. Networking and resilience	3.29	3.35	3.32	Required
Cluster Mean	**3.43**	**3.47**	**3.45**	**Required**

Source: Field survey (2026). Criterion mean = 2.50.

Table 3 reveals that all seven entrepreneurial competency items recorded grand means above the criterion mean, ranging from 3.32 to 3.58, with a cluster mean of 3.45. Opportunity recognition, financial literacy, and business planning attracted the highest ratings, indicating that respondents regarded the capacity to identify and develop viable ventures as paramount. As with the technological cluster, the graduate and employer means were closely aligned, signalling consensus on the required entrepreneurial competencies.

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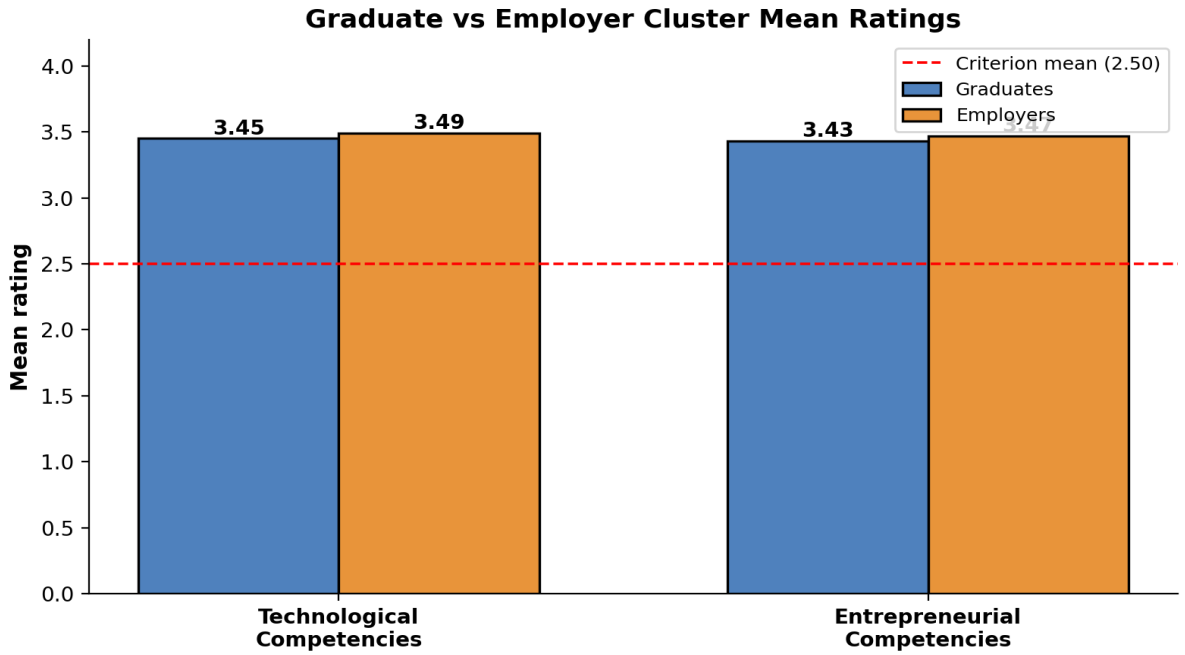
Figure 2: Comparison of Graduate and Employer Cluster Means



Source: Field survey (2026).

Figure 2 visually confirms the narrow gap between graduate and employer ratings across both competency clusters. In each domain the employer mean is marginally higher than the graduate mean, yet both remain well above the 2.50 criterion, foreshadowing the non-significant differences established by the hypothesis tests.

4.2 Testing the Hypotheses

The two null hypotheses were tested using the independent-samples t-test at the 0.05 level of significance. Table 4 summarises the results.

Table 4: t-test of Difference between Graduate and Employer Mean Responses

Variable	Group	N	df	t-cal	p-value	Decision
Technological competencies	Graduates	240	398	0.92	0.36	Retained
	Employers	160				
Entrepreneurial competencies	Graduates	240	398	1.05	0.29	Retained
	Employers	160				

Source: Field survey (2026). Significance level = 0.05.

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Table 4 shows that, for technological competencies, the calculated t-value was 0.92 with a p-value of 0.36, which exceeds the 0.05 threshold. The first null hypothesis was therefore retained, indicating no significant difference between the mean responses of graduates and employers. Similarly, for entrepreneurial competencies, the calculated t-value was 1.05 with a p-value of 0.29, again exceeding 0.05; the second null hypothesis was likewise retained. These results confirm that graduates and employers share a common view of the competencies required for sustainable employability.

4.3 Discussion of Findings

The finding that all listed technological competencies were required for sustainable employability aligns with current scholarship identifying digital and technological competence as a baseline requirement in the contemporary workplace. The prominence of electronic communication, digital literacy and spreadsheet handling reflects the digitalisation of business processes and reinforces calls in the literature for the deliberate integration of digital tools into the Business Education curriculum. The relatively lower, though still above-criterion, rating for cybersecurity awareness suggests an emerging competency area that curricula have yet to emphasise fully.

The finding that entrepreneurial competencies were highly required corroborates studies that position entrepreneurial agility and self-reliance skills as essential for graduate employability, particularly in contexts of limited formal employment. The high ratings for opportunity recognition, financial literacy and business planning echo the literature's emphasis on the practical capacities needed to create and sustain enterprises. This finding strengthens the argument for a curriculum that fuses entrepreneurial, technical and innovative competencies rather than treating entrepreneurship as a theoretical add-on.

The retention of both null hypotheses, indicating no significant difference between graduate and employer perceptions, is consistent with prior research reporting broad stakeholder agreement on the competencies that matter for employability. This convergence is significant for policy: where graduates and employers agree on competency priorities, curriculum reform can proceed on a firm evidentiary footing, with reduced risk of misalignment between training and labour-market demand. The shared perception also lends support to the human-capital premise that investment in these competencies will yield employability returns recognised by both the supply and demand sides of the labour market.

4.4 Implications of the Study

The findings carry several implications. For curriculum planners and the National Commission for Colleges of Education, the results justify a deliberate review of the Business Education curriculum to embed technological and entrepreneurial competencies as core, practically assessed components. For lecturers, the findings underscore the need for sustained professional development in digital and enterprise pedagogy, so that they can model the competencies graduates are expected to acquire. For employers, the convergence of perceptions invites stronger partnership with Colleges of Education through internships, mentorship and work-

based learning. For graduates, the results affirm that investing in both competency domains enhances prospects for wage employment and self-employment alike.

5. Conclusion

This study examined the technological and entrepreneurial competencies required of Business Education graduates of Colleges of Education for sustainable employability in North-East Nigeria. It established that both competency domains are highly required and that graduates and employers do not differ significantly in their perceptions of these competencies. The study concludes that the integration of technological and entrepreneurial competencies into the Business Education curriculum is indispensable for the sustainable employability of graduates, especially in a zone confronting acute labour-market and developmental challenges. Aligning training with these stakeholder-validated competencies offers a credible pathway to both employment and self-reliance.

6. Recommendations

Based on the findings, the study recommends that:

1. The National Commission for Colleges of Education and curriculum planners should review the Business Education curriculum to incorporate technological and entrepreneurial competencies as core, practically assessed components;
2. Colleges of Education should organise regular capacity-building programmes to upgrade the digital and entrepreneurial competencies of Business Education lecturers;
3. Institutions should establish and strengthen partnerships with employers and enterprise centres to provide internships, mentorship and work-based learning for students;
4. Governments and development partners should improve digital infrastructure in Colleges of Education in the zone to support hands-on technological skill acquisition; and
5. Business Education students should be encouraged, through structured incubation and start-up support, to translate entrepreneurial knowledge into viable ventures for self-reliance.

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