Entrepreneurship Education and Self-Reliance among University Graduates in Adamawa State, Nigeria

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ABSTRACT

Graduate under-employment remains a structural problem in Nigeria, where headline unemployment is low under the revised labour-force methodology but informal, low-productivity work predominates. This study examined the association between entrepreneurship education and self-reliance among university graduates resident in Adamawa State, a conflict-affected state in North-East Nigeria, and identified the barriers graduates face in converting entrepreneurial learning into sustainable livelihoods.

An explanatory sequential mixed-methods design was used. A structured questionnaire was administered to 400 graduates of five public universities serving the state (Adamawa State University, Mubi; Modibbo Adama University, Yola; University of Maiduguri; Taraba State University, Jalingo; and Federal University Wukari). Semi-structured interviews were then conducted with 40 purposively selected respondents. Data were analysed with chi-square tests, independent-samples *t*-tests, Pearson correlation and regression, and reflexive thematic analysis.

Although 78.0% of graduates had taken a formal entrepreneurship course, only 47.3% had received practical training, 23.0% mentorship and 19.5% incubation support. Graduates with entrepreneurship education were more likely to be self-employed (34.6% vs 21.6%; OR = 1.92) and financially self-sufficient (73.1% vs 51.1%; OR = 2.59), and they reported higher scores on all five entrepreneurial competencies (Cohen's d = 0.64–0.82). Entrepreneurship education scores correlated positively with self-reliance scores (r = .647, 95% CI [.586, .701]; R^2 = .418). Inadequate funding (67.8%), weak government support (66.8%) and fear of failure (61.8%) were the leading barriers. Interviews indicated that practical learning, adaptive problem-solving and context-specific innovation shaped how graduates used their training.

The study examines graduates' realised outcomes rather than students' intentions, distinguishes self-employment from financial self-sufficiency, and integrates survey and interview evidence from an under-researched, conflict-affected setting. The findings are associational rather than causal. They suggest that entrepreneurship education is necessary but not sufficient for self-reliance, and that it should be paired with practical training, mentorship, incubation and access to start-up finance.

Keywords: entrepreneurship education; self-reliance; self-employment; entrepreneurial competencies; graduate employability; Adamawa State; Nigeria

INTRODUCTION

Securing productive work for young people is a defining development challenge. Globally, the youth (15–24) unemployment rate fell to 13.0% in 2023, its lowest level in 15 years, yet 20.4% of young people were not in employment, education or training (NEET) (International Labour Organization [ILO], 2024a). In sub-Saharan

Africa the youth NEET rate was 21.9%, and the core deficit is the scarcity of productive, decent work rather than the absence of any work (ILO, 2024b). As salaried formal jobs fail to keep pace with the number of graduates, governments and universities across the region increasingly promote self-employment as an alternative pathway (Premand et al., 2016).

Nigerian labour statistics must be read with care because the National Bureau of Statistics (NBS) changed its methodology in 2023. Under the former definition, which classified anyone working fewer than 20 hours a week as unemployed, the NBS reported national unemployment of 33.3% and youth (15–34) unemployment of 42.5% in the fourth quarter (Q4) of 2020 (NBS, 2021). The revised Nigeria Labour Force Survey (NLFS), aligned with the 19th International Conference of Labour Statisticians, classifies a person as unemployed only if they did no work at all in the reference week while seeking and available for work (NBS, 2023). On this basis, unemployment was 4.3% overall and 6.5% among youth aged 15–24 in Q2 2024, but 93.0% of employed persons were in informal employment, and the combined rate of unemployment and time-related underemployment was 13.0% (NBS, 2024). The two series measure different concepts and are not comparable. Low headline unemployment under the new standard does not indicate a healthy graduate labour market; rather, it shows that most people cannot afford to be without some work, and that the core problem is the quality and productivity of the work available. Poverty is also rising: the World Bank (2026) estimates that 63% of Nigerians (about 140 million) lived below the national poverty line in 2025, and multidimensional poverty is concentrated in the North (NBS, 2022).

Adamawa State, in the North-East geopolitical zone, presents a particularly demanding context. In the last state-level estimates published under the former methodology, Adamawa had the second-highest unemployment rate in the country (54.9% in Q4 2020; NBS, 2021); comparable state estimates have not yet been published under the revised NLFS. The state's economy is predominantly agrarian, with a small formal private sector, and it has been affected since 2014 by insurgency and communal conflict. At the end of 2025, about 2.29 million people remained internally displaced across the North-East, mainly in Borno, Adamawa and Yobe States (UNHCR, 2026), and the Adamawa State Government (2025) continues to document the long-term livelihood effects of displacement. Insecurity disrupts markets, raises transaction costs and deters investment, shaping the entrepreneurial options open to graduates.

Nigeria's policy response has centred on entrepreneurship education. In 2006 the federal government directed that entrepreneurship studies be compulsory for all undergraduates, with implementation from the 2007/2008 session through the National Universities Commission and university entrepreneurship development centres (Sulaimon, 2020). The policy assumes that entrepreneurial knowledge and skills can be taught and that graduates who possess them will create ventures rather than wait for salaried jobs. Implementation varies, however: studies in the North-East report lecture-dominated delivery, inadequate facilities and limited funding (Musa et al., 2024; Usman et al., 2022), and international reviews show that outcomes depend heavily on pedagogy and context (Nabi et al., 2017).

Problem statement

More than fifteen years after the mandate, there is little evidence on whether entrepreneurship education is associated with graduates' actual economic outcomes in Adamawa State, as distinct from students' attitudes or intentions. Local studies have mostly surveyed enrolled students or institutional staff (Egunsola et al., 2012; Musa et al., 2024; Usman et al., 2018, 2022). Few have examined whether practical components such as hands-on training, mentorship and incubation are reaching graduates, or how finance, institutional support and insecurity condition their ability to turn learning into self-reliance.

Objectives

The study aimed to (1) examine the association between entrepreneurship education and graduates' self-reliance, including self-employment, financial self-sufficiency and entrepreneurial competencies; (2) identify barriers to graduates' entrepreneurial success; and (3) identify strategies for strengthening the entrepreneurial ecosystem. The corresponding research questions asked: (RQ1) to what extent exposure to entrepreneurship education is associated with self-employment, financial self-sufficiency, competencies and overall self-reliance; (RQ2) what

barriers graduates perceive and how they experience them; and (RQ3) what strategies graduates consider necessary.

Hypotheses (tested at $\alpha = .05$):

- H01: There is no significant difference in self-employment rates between graduates with and without formal entrepreneurship education.
- H02: There is no significant difference in financial self-sufficiency between graduates with and without formal entrepreneurship education.
- H03: There is no significant difference in entrepreneurial competency scores between graduates with and without formal entrepreneurship education.
- H04: There is no significant relationship between entrepreneurship education scores and self-reliance scores.

Significance

The study provides outcome-level evidence on graduates in a conflict-affected state that is under-represented in the literature. It separates entrepreneurship education into theoretical and practical components and distinguishes self-employment from financial self-sufficiency. It integrates statistical and interview evidence. It also gives universities, governments, financiers and development partners evidence on where entrepreneurship support is falling short.

LITERATURE REVIEW

Conceptual clarification

Entrepreneurship education is structured educational activity intended to develop the knowledge, skills and dispositions needed to identify opportunities and create ventures. It ranges from teaching *about* entrepreneurship (lectures), through teaching *for* it (business-plan and skills practice), to learning *through* it (real ventures, mentorship and incubation) (Nabi et al., 2017). Entrepreneurial competencies are the capabilities that enable a person to perform entrepreneurial tasks; this study examines five of them. Self-reliance is a graduate's capacity to meet their economic needs through their own productive activity, without dependence on family transfers, government employment or aid. Section 4 distinguishes its dimensions.

Empirical review

Entrepreneurship education and intentions. Meta-analyses show a small positive average association between entrepreneurship education and entrepreneurial intentions, which weakens when prior intentions are controlled (Bae et al., 2014; Zhang et al., 2022). A systematic review of 159 studies found that the field relies on short-term, self-reported outcomes and seldom describes the pedagogy being evaluated (Nabi et al., 2017). Causal evidence is more cautious. In the Netherlands, a quasi-experimental evaluation found that a leading mini-company programme had no effect on self-assessed skills and a negative effect on intentions (Oosterbeek et al., 2010). In Nigeria, a longitudinal study found that entrepreneurship education strengthened the attitudinal antecedents of intention (Otache et al., 2021). In Mubi, Adamawa State, exposure to entrepreneurship education was associated with more favourable attitudes towards self-employment among 370 undergraduates (Egunsola et al., 2012). Intentions, however, do not guarantee action.

Entrepreneurship education and self-employment. Evidence on realised outcomes is scarcer. A randomised trial in Tunisia found that an entrepreneurship track combining training and coaching produced a statistically significant but small increase in graduates' self-employment, with no change in overall employment (Premand et al., 2016). Nigerian cross-sectional studies report much larger associations: competencies, skills and attitudes predicted new business creation among 392 Ebonyi State University graduates (Udu & Nkwagu, 2023), and entrepreneurial capabilities partly mediated the link between education and venture creation among 291

graduates (Shehu & Ahmad, 2023). The gap between modest experimental effects and large survey associations suggests that self-selection and common-method variance may inflate cross-sectional estimates.

Practical training, mentorship and incubation. Across settings, experiential components appear to matter more than lecture content. In North-East polytechnics, lecture-based teaching and written examinations were found to limit the practical application of entrepreneurial skills (Musa et al., 2024). Few participants in an Adamawa skills-acquisition programme went on to run businesses, citing inadequate trainers, facilities and start-up funds (Usman et al., 2018). In South Africa, perceived lecturer competence predicted intention more strongly than curriculum content (Iwu et al., 2021). Mentoring supports entrepreneurs' cognitive learning (St-Jean & Audet, 2012), whereas evidence on incubation is mixed: among 2,544 Italian start-ups, incubation had no short-term growth benefit and a positive effect only over the longer term (Lukeš et al., 2019). In Nigeria, incubation-related capabilities correlated moderately with graduates' self-sustainability (Ulo et al., 2020).

Competencies, finance and support. Competencies are a plausible channel linking education to outcomes. In Tanzania, the odds of higher competency acquisition rose with the number of entrepreneurship courses taken, and family self-employment background also mattered (Nzilano, 2024). In Ghana, the association between entrepreneurship education and venture creation operated mainly through self-efficacy (Mickson, 2026). Finance is a binding constraint: across 30 African countries, access-to-finance constraints reduced firm growth (Fowowe, 2017). Support effects are not straightforward. The benefits of entrepreneurship programmes vary with participants' prior resources (Lyons & Zhang, 2018), and in one Nigerian graduate sample higher levels of support unexpectedly weakened the link between capabilities and venture creation (Shehu & Ahmad, 2023). In Adamawa colleges of education, staffing, learning materials and funding were rated inadequate for entrepreneurship education aimed at self-reliance (Usman et al., 2022).

Table 1. Summary of key empirical studies

Study	Context and design	Key finding	Limitation relative to this study
Egunsola et al. (2012)	Mubi, Adamawa; 370 undergraduates; descriptive survey	EE improved attitudes to self-employment	Students; intentions; no inferential tests
Usman et al. (2018)	Yola, Adamawa; 80 trainees; regression	Few ran businesses; funds and trainers lacking	Diploma students; small sample
Usman et al. (2022)	Adamawa colleges of education; 106 respondents	Resource and funding gaps in EE	Perceptions only
Musa et al. (2024)	North-East polytechnics; 241 staff	Lecture-based delivery limits practical skills	Staff, not graduate outcomes
Udu & Nkwagu (2023)	Ebonyi; 392 graduates; regression	Competencies and attitudes predict business creation	Outcome measure undescribed
Shehu & Ahmad (2023)	Nigeria; 291 graduates; PLS-SEM	Capabilities partially mediate EE–venture creation	Cross-sectional; not North-East
Ulo et al. (2020)	Ebonyi; 270 graduates; correlation	Incubation capabilities correlate with self-sustainability	Single university
Premand et al. (2016)	Tunisia; randomised trial	Small rise in self-employment	Short follow-up

Nzilano (2024)	Tanzania; 391 graduates; ordinal logit	More courses and family background raise competencies	Self-assessed competencies
Mickson (2026)	Ghana; cross-sectional SEM	EE effect on ventures operates via self-efficacy	Cross-sectional
Oosterbeek et al. (2010)	Netherlands; quasi-experiment	No skill effect; negative intention effect	High-income context
Fowowe (2017)	30 African countries; 10,888 firms	Finance constraints reduce firm growth	Firms, not graduates

Note. EE = entrepreneurship education.

Research gap

The review identifies five gaps. (1) *Context:* evidence from Adamawa State and the North-East is limited and largely descriptive. (2) *Population and outcome:* most studies examine students' intentions rather than graduates' realised outcomes, and the graduate studies that exist elsewhere in Nigeria define self-reliance inconsistently. (3) *Components:* studies seldom separate course exposure from practical training, mentorship and incubation. (4) *Constraints:* finance, institutional support and insecurity are rarely examined alongside education. (5) *Method:* few studies combine survey and interview evidence. This study does not claim to be the first to link entrepreneurship education to graduate outcomes in Nigeria. Its contribution is mixed-methods, outcome-focused evidence from Adamawa State that distinguishes the components of entrepreneurship education and the dimensions of self-reliance.

Theoretical and Conceptual Framework

Human Capital Theory

Developed by Schultz (1961) and formalised by Becker (1964), Human Capital Theory holds that education and training are investments that raise individual productivity and future returns. It assumes that skills increase productivity, that productivity is rewarded, and that individuals invest rationally. In entrepreneurship research, task-related human capital is more strongly associated with venture success than general education (Unger et al., 2011), and entrepreneurship education is associated with the formation of entrepreneurship-specific human capital (Martin et al., 2013). Applied to this study, entrepreneurship education is the investment, competencies are the resulting human capital, and self-employment, financial self-sufficiency and self-reliance are the returns. The theory's main limitation is its supply-side focus. In settings where finance is scarce and insecurity is high, skilled graduates may be unable to realise returns, and the theory struggles to separate the effect of education from self-selection (Marvel et al., 2016).

Innovation Theory

Schumpeter (1934) defined the entrepreneur as the agent who carries out "new combinations" (new products, methods, markets, sources of supply or forms of organisation) and later described this process as creative destruction (Schumpeter, 1942). Subsequent work emphasised alertness to unnoticed opportunities (Kirzner, 1973) and the discovery, evaluation and exploitation of opportunities (Shane & Venkataraman, 2000). In low-income settings, innovation often means adapting known products or business models to local constraints. The theory implies that entrepreneurship education is valuable insofar as it builds the capacity to recognise opportunities, manage risk and plan ventures, and that practical exposure to markets, mentors and incubators should matter most. In Adamawa State, such innovation is most likely to involve adapting agricultural, digital and energy services to conditions of insecurity and weak infrastructure. A limitation of the theory is that it centres on transformative innovation, whereas most graduate self-employment is small-scale and imitative.

Integration and conceptual framework

Human Capital Theory explains *how* entrepreneurship education may produce self-reliance: by building competencies. Innovation Theory explains *what kind* of activity converts those competencies into economic value: the recognition and exploitation of new or adapted opportunities. Neither treats the resources needed for conversion as automatic. Figure 1 integrates these ideas.

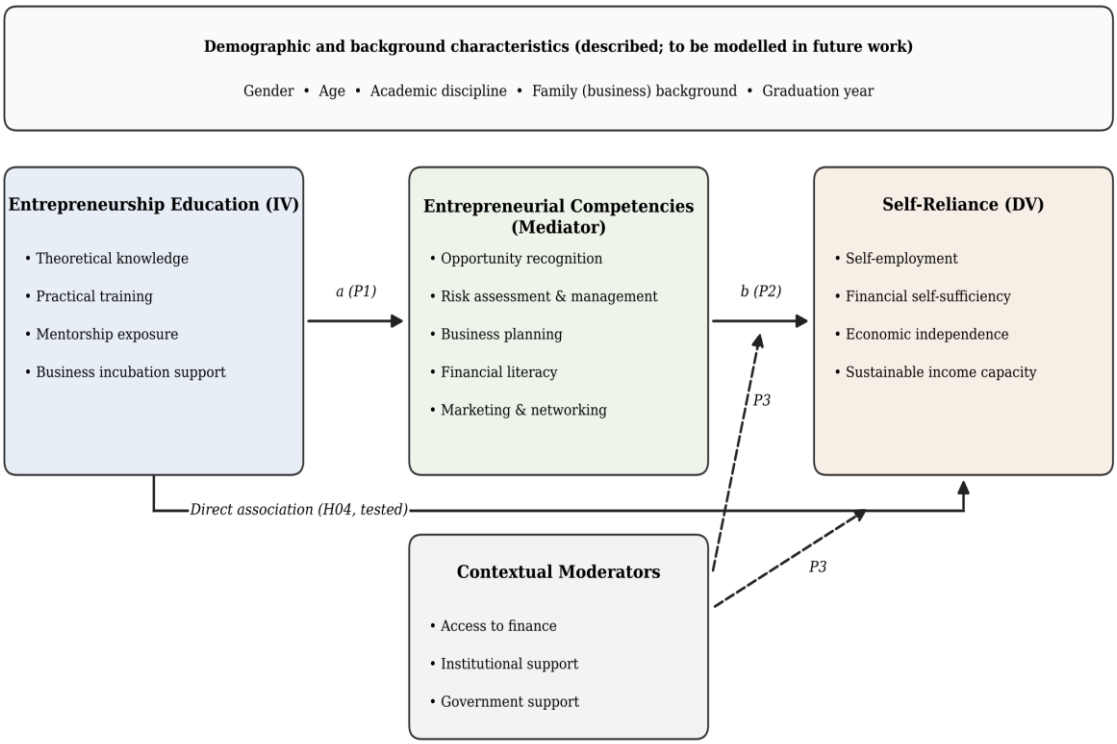


Figure 1. Conceptual framework. Solid arrows show proposed paths and dashed arrows proposed moderation. Only the direct association (H04) and group differences (H01–H03) were tested in this study; propositions P1–P3 are theoretically derived and are recommended for future testing. Source: authors' construction.

In the framework, *entrepreneurship education* (theoretical knowledge, practical training, mentorship and incubation) is the independent variable. *Entrepreneurial competencies* are a proposed mediator, transmitting part of the effect of education (P1: education builds competencies; P2: competencies raise self-reliance). *Self-reliance* is the dependent variable. Access to finance and institutional and government support are proposed moderators (P3), which may strengthen or weaken the conversion of competencies into self-reliance. A mediator transmits a relationship, whereas a moderator alters its strength. Including a path in the framework does not imply that it has been empirically established.

Operational Definitions and Measurement

The outcome terms used in the literature are distinguished as follows. *Self-employment* is an employment status: the graduate's main activity is operating their own business. *Financial self-sufficiency* is an income-adequacy condition: the graduate's own income covers their basic living expenses without regular support from others, whether that income comes from a business or a wage. *Financial independence* adds savings or assets sufficient to absorb shocks, and *economic independence* refers to control over one's own economic decisions and productive resources. *General self-reliance* is the overarching construct, measured here as a composite score. A graduate may therefore be self-employed but not self-sufficient, or self-sufficient through wage employment.

All constructs were measured with a five-section questionnaire: (A) demographics; (B) entrepreneurship education exposure; (C) self-reliance assessment; (D) entrepreneurial skills and competencies; and (E) barriers. Likert items used a five-point scale (1 = strongly disagree, 5 = strongly agree).

Table 2. Operationalisation of study variables

Variable (role)	Operational definition	Measurement
Formal EE exposure (IV)	Completed at least one formal entrepreneurship course	Section B; yes/no
Practical training, mentorship, incubation (IV components)	Received hands-on training; mentorship from a practising entrepreneur; access to an incubation facility	Section B; yes/no items
EE score (IV, continuous)	Overall intensity of entrepreneurship education received	Section B; mean of Likert items
Entrepreneurial competencies	Opportunity recognition; risk assessment and management; business planning; financial literacy; marketing and networking	Section D; mean score per sub-scale (1–5)
Self-employment (DV dimension)	Main activity is own business	Employment-status item; 1 = self-employed
Financial self-sufficiency (DV dimension)	Own income covers basic living expenses	Section C; yes/no
Self-reliance score (DV)	Composite capacity to meet economic needs independently	Section C; mean of Likert items
Barriers	Funding, government support, fear of failure, market knowledge, registration, security	Section E; % agree/strongly agree

Note. EE = entrepreneurship education; IV = independent variable; DV = dependent variable.

METHODOLOGY

Design, setting and population

The study used an explanatory sequential mixed-methods design (Creswell & Plano Clark, 2018). A cross-sectional survey (priority strand) was followed by semi-structured interviews that explained and elaborated on the survey results; the strands were integrated at the interpretation stage (Fetters et al., 2013). The target population comprised university graduates resident in Adamawa State who had completed their degrees within the five years preceding data collection (2021–2025). They had graduated from five public universities that serve the state and its neighbouring areas, giving an estimated population of 12,500.

Selection of universities and sampling

The universities were selected purposively. They include the two established universities located in Adamawa State and three public universities in the neighbouring states of Borno and Taraba whose graduates commonly live and work in Adamawa. All five are public universities that run the nationally mandated entrepreneurship course. The newly established Federal University of Agriculture, Mubi, was not included because it had not yet produced graduates.

Sample size was determined using Yamane's (1967) formula, $n = N/(1 + Ne^2) = 12{,}500/(1 + 12{,}500 \times 0.05^2) \approx 388$, which was rounded up to 400 to allow for incomplete responses. A multi-stage procedure was applied: (i) purposive selection of universities; (ii) stratification of graduates by academic discipline and graduation year; and (iii) random selection of respondents within strata. Table 3 shows the distribution of the 400 respondents. The larger shares from Adamawa State University and Modibbo Adama University reflect the predominance of graduates of the two in-state universities in the state's graduate population.

Table 3. Distribution of survey respondents by university

University	Location (State)	Ownership	Year established	*n*	%
Adamawa State University, Mubi	Adamawa	State	2002	103	25.8
Modibbo Adama University, Yola	Adamawa	Federal	1981	95	23.8
University of Maiduguri	Borno	Federal	1975	82	20.5
Taraba State University, Jalingo	Taraba	State	2008	70	17.5
Federal University Wukari	Taraba	Federal	2011	50	12.5
Total				**400**	**100.0**

For the qualitative strand, 40 survey respondents who consented to follow-up were selected by maximum-variation purposive sampling across entrepreneurship education exposure (with and without practical training), employment outcome (self-employed, wage-employed and unemployed), gender and university.

Instruments, validity and reliability

The questionnaire is described in Section 4. The interview guide covered personal entrepreneurship experiences, the perceived contribution of entrepreneurship education, challenges and recommendations, with probes informed by the survey results. Face and content validity were established through review by specialists in entrepreneurship education and in measurement and evaluation, whose comments informed revisions to item wording. Internal consistency was satisfactory, with Cronbach's alpha coefficients for the scales ranging from .78 to .89.

Data collection

The survey was conducted from May to August 2026, using an online questionnaire (60% of responses) and paper copies distributed in person (40%). Interviews were conducted in September and October 2026, so data collection spanned six months in total.

Data analysis

Quantitative data were analysed with IBM SPSS Statistics 28.0. H01 and H02 were tested with Pearson's chi-square tests, with phi (φ) and odds ratios (OR) reported as effect sizes. H03 was tested with independent-samples *t*-tests, with Cohen's *d* as the effect size. H04 was tested with Pearson correlation and ordinary least-squares regression. Effect sizes and confidence intervals were computed from the test statistics and group sizes. Interview data were analysed using Braun and Clarke's (2006, 2021) reflexive thematic analysis in six phases: (1) familiarisation through verbatim transcription and repeated reading; (2) systematic initial coding, combining deductive codes drawn from the survey results with inductive codes from the data; (3) generation of candidate themes; (4) review of themes against coded extracts and the full data set; (5) definition and naming of themes; and (6) reporting. Trustworthiness was supported through peer debriefing among the authors and an audit trail of coding decisions (Lincoln & Guba, 1985).

Ethical considerations

Ethical approval was obtained before data collection. Participation was voluntary. Respondents were informed of the study's purpose, their right to withdraw and the confidentiality of their responses, and gave informed consent: electronically for online questionnaires, in writing for paper questionnaires, and before audio-recording for interviews. No personal identifiers were stored with the data, and interviewees are identified by codes. Given the security situation, interviews were held at times and places chosen by participants.

RESULTS

Respondent profile and exposure to entrepreneurship education

Of the 400 respondents, 58.5% were male and 41.5% female. The largest age group was 26–30 years (46.8%), and 66.8% were single. Most (77.8%) had graduated between 2022 and 2025. Social Sciences graduates formed the largest disciplinary group (30.8%), followed by Sciences (22.3%) and Management/Business (19.0%).

Table 4. Exposure to components of entrepreneurship education (N = 400)

Component	***n***	**%**
Completed a formal entrepreneurship course	312	78.0
Received practical training components	189	47.3
Received mentorship from a practising entrepreneur	92	23.0
Had access to business incubation facilities	78	19.5

Course exposure was widespread, as expected under the national mandate, but the experiential components that the literature identifies as most consequential reached fewer than half of the graduates (practical training) or fewer than a quarter (mentorship and incubation).

Employment outcomes and self-reliance (H01, H02)

At the time of the survey, 31.8% of graduates were self-employed, 39.0% were private-sector employees, 16.8% were government employees and 12.5% were unemployed. Fewer than one in five graduates were therefore in public-sector employment.

Table 5. Self-employment and financial self-sufficiency by exposure to entrepreneurship education

Outcome	**With EE (*n* = 312)**	**Without EE (*n* = 88)**	**$\chi^2(1)$**	***p***	**φ**	**OR [95% CI]**	**Difference, percentage points [95% CI]**
Self-employed	108 (34.6%)	19 (21.6%)	5.12	.024	.11	1.92 [1.10, 3.36]	13.0 [2.9, 23.1]
Financially self-sufficient	228 (73.1%)	45 (51.1%)	12.67	< .001	.18	2.59 [1.59, 4.22]	21.9 [10.4, 33.5]

Note. EE = formal entrepreneurship education; OR = odds ratio.

H01 and H02 were rejected. Graduates with entrepreneurship education were significantly more likely to be self-employed and to be financially self-sufficient. The association with self-employment was small (φ = .11). The 13-point difference is a 60% relative increase (34.6/21.6), but the confidence interval for the absolute difference is wide. The association with financial self-sufficiency was larger (φ = .18; OR = 2.59), which suggests that the benefits of entrepreneurship education extend beyond business ownership to income adequacy more generally.

Entrepreneurial competencies (H03)

Table 6. Entrepreneurial competency scores by exposure to entrepreneurship education

Competency	**With EE, *M***	**Without EE, *M***	**Difference**	***t*(398)**	***p***	**Cohen's *d* [95% CI]**
Opportunity recognition	3.58	2.97	0.61	5.34	< .001	0.64 [0.40, 0.89]

Risk assessment and management	3.44	2.76	0.68	5.89	< .001	0.71 [0.47, 0.95]
Business planning	3.35	2.54	0.81	6.78	< .001	0.82 [0.58, 1.06]
Financial literacy	3.26	2.51	0.75	6.23	< .001	0.75 [0.51, 0.99]
Marketing and networking	3.19	2.41	0.78	6.21	< .001	0.75 [0.51, 0.99]

Note. Scores range from 1 to 5; group sizes are 312 and 88. All differences remain significant at a Bonferroni-adjusted α of .01.

H03 was rejected for all five competencies, with medium-to-large effect sizes (d = 0.64–0.82). The largest differences were in business planning and financial literacy, which are procedural and readily taught. The smallest was in opportunity recognition, the competency most dependent on market experience. Even among graduates with entrepreneurship education, mean scores lay near the scale midpoint (3.19–3.58), indicating moderate rather than high self-assessed proficiency.

Barriers to entrepreneurship (RQ2)

Table 7. Barriers to entrepreneurship reported by graduates (N = 400)

Barrier	***n* agreeing**	**%**
Inadequate funding / start-up capital	271	67.8
Lack of government support	267	66.8
Fear of failure	247	61.8
Insufficient market knowledge	236	59.0
Complex business registration processes	223	55.8
Security challenges	176	44.0

Note. "Agreeing" = agree or strongly agree.

The leading barriers combine a financial constraint, an institutional constraint and a psychological one. That 59.0% reported insufficient market knowledge (a competency that entrepreneurship education is meant to supply) suggests that curricula have not fully closed this gap.

Entrepreneurship education and self-reliance (H04)

Table 8. Correlation and regression of self-reliance on entrepreneurship education score (N = 400)

Statistic	**Value**
Pearson r [95% CI]	.647 [.586, .701], p < .001
Standardised β (*SE*) [95% CI]	.647 (.038) [.572, .722]
t	16.95, p < .001
R^2 / adjusted R^2	.418 / .417

$F(1, 398)$	287.45, $p < .001$
Cohen's f^2	0.72

Note. The model contains a single predictor, so the standardised β equals *r*. The 95% CI for *r* was obtained by Fisher's *z* transformation.

H04 was rejected. Entrepreneurship education scores were strongly and positively correlated with self-reliance scores, and in a bivariate model they accounted for about 42% of the variance. This association is larger than the average associations reported in meta-analyses (Bae et al., 2014). Because both measures were self-reported in the same instrument and the model does not adjust for background characteristics, the estimate should be regarded as an upper bound on the association (Podsakoff et al., 2003).

Qualitative findings

Three themes were generated from the 40 interviews.

Theme 1: Practice makes the difference. Participants consistently distinguished between the classroom entrepreneurship course and its practical components. They regarded the course as useful, but its value was substantially greater where it included hands-on training. This theme helps explain why the strongest survey differences were in procedural competencies, and it underlines the significance of the finding that only 47.3% received practical training.

Theme 2: Adaptive problem-solving under structural constraint. Participants described funding shortages, weak government support and insecurity as persistent obstacles that education alone could not remove. Participants with entrepreneurship training more often described resilient, problem-solving approaches to working around these constraints. This theme expands the survey barrier results by showing how the constraints are experienced and managed.

Theme 3: Context-specific innovation. Some participants had adapted their ventures to the local context, including agricultural innovations, digital agricultural extension services, mobile-money services for rural communities and renewable-energy solutions for off-grid areas. These cases illustrate the Schumpeterian idea of new combinations adapted to local constraints. They are not evidence of region-wide effects.

Table 9. Joint display of quantitative and qualitative findings

Research question	**Quantitative finding**	**Qualitative finding**	**Meta-inference**
RQ1: EE and self-reliance	EE associated with self-employment (OR 1.92), self-sufficiency (OR 2.59), competencies (*d* 0.64–0.82), self-reliance (*r* = .65)	Theme 1: value of the course is greater with hands-on training	*Expands*: association appears strongest where learning is practical
RQ1: delivery	Practical 47.3%; mentorship 23.0%; incubation 19.5%	Theme 1	*Confirms*: a practice gap in delivery
RQ2: barriers	Funding 67.8%; government support 66.8%; fear of failure 61.8%; security 44.0%	Theme 2: constraints persist; trained graduates adapt	*Expands*: barriers limit, but do not cancel, the value of training
RQ3: strategies	Barrier profile indicates finance and support gaps	Themes 2–3: adaptive problem-solving; locally adapted ventures	*Confirms*: education must be paired with finance and support

DISCUSSION

Entrepreneurship education was positively associated with every outcome measured. These results are consistent with Human Capital Theory (Becker, 1964; Martin et al., 2013) and with Nigerian graduate studies (Shehu & Ahmad, 2023; Udu & Nkwagu, 2023). The magnitudes, however, differ in an instructive way. The association with self-employment, an objective status, was small ($\varphi = .11$), echoing the modest experimental effect found in Tunisia (Premand et al., 2016). Associations with self-rated competencies and self-reliance were much larger. One interpretation, consistent with Mickson (2026), is that entrepreneurship education changes graduates' capabilities more readily than their employment status, because entering self-employment also requires capital, markets and security. A second, complementary interpretation is methodological: same-source self-reports inflate correlations (Podsakoff et al., 2003). The self-employment estimate is therefore the more conservative indicator of the behavioural association. The larger association with financial self-sufficiency suggests that skills such as financial literacy and planning bring returns across occupations, so entrepreneurship education should not be judged solely by the number of graduates who start businesses.

The most policy-relevant finding is the *practice gap*: course exposure was nearly universal, whereas practical training, mentorship and incubation reached a minority. This mirrors delivery problems documented in the North-East (Musa et al., 2024; Usman et al., 2018, 2022) and the international conclusion that experiential pedagogies are the most promising (Nabi et al., 2017). From an Innovation Theory perspective, the comparatively small difference in opportunity recognition is telling, because this competency develops through exposure to markets, mentors and incubators rather than through lectures. The interview themes support this reading.

The barrier profile exposes the limits of Human Capital Theory in this setting: skills are necessary but not sufficient when complementary resources are absent. Funding constraints correspond to African evidence that limited finance depresses enterprise growth (Fowowe, 2017). The 44% of graduates citing insecurity reflects a constraint specific to the North-East (UNHCR, 2026). Fear of failure is consistent with a culture that treats salaried work as the secure option, a disposition that mentorship can address (St-Jean & Audet, 2012).

Association, prediction and causation. "Association" here denotes statistical relationships and "prediction" the variance accounted for in regression; neither implies causation. Three alternative explanations cannot be excluded: self-selection (more entrepreneurial graduates may engage more with entrepreneurship education), reverse causation (graduates running businesses may rate their training more highly) and omitted variables such as family resources. Because the course is compulsory, the 22% without formal exposure may also differ systematically from other graduates. The findings therefore identify entrepreneurship education as a correlate and plausible contributor to graduate self-reliance, not as its proven cause.

Limitations and future research. The design is cross-sectional, and competencies and self-reliance were self-reported. The universities were selected purposively, and 60% of responses were collected online. Demographic characteristics such as gender, age, discipline and family background were described but not modelled, and the proposed mediation (P1–P2) and moderation (P3) paths were not tested. Future research should (a) follow graduate cohorts longitudinally; (b) estimate multiple-regression, mediation and moderation models that separate the four components of entrepreneurship education and control for demographic and family characteristics; (c) use objective outcomes such as business registration, revenue and employees; and (d) compare conflict-affected and more stable states.

CONCLUSION AND RECOMMENDATIONS

Among 400 graduates resident in Adamawa State, entrepreneurship education was consistently associated with higher self-employment, financial self-sufficiency, entrepreneurial competencies and self-reliance. The association with actual self-employment was modest, and practical training, mentorship and incubation reached only a minority of graduates. Self-reliance was further constrained by inadequate finance, weak government support, fear of failure and insecurity. Entrepreneurship education therefore appears necessary but not sufficient for graduate self-reliance. Its potential is most likely to be realised when classroom instruction is combined with practical, mentored learning and access to finance and institutional support.

Recommendations, each linked to a specific finding:

1. **Universities** should make a practitioner-assessed practical component (a business plan, supervised venture project or enterprise placement) a graded requirement of the entrepreneurship course, so that the 47.3% coverage of practical training rises to all students. They should strengthen market-assessment training, given that 59.0% of graduates reported insufficient market knowledge, revitalise incubation within their entrepreneurship development centres, build alumni-entrepreneur mentorship networks and institutionalise graduate tracer studies.

2. **Federal and Adamawa State governments** should establish graduate start-up funds that blend grants with concessional loans and are linked to completion of practical training or incubation. They should simplify business registration through campus- or local-government-level registration desks and fee waivers for first-time graduate entrepreneurs, and integrate graduate entrepreneurship into livelihood-recovery programmes in conflict-affected local government areas.

3. **Financial institutions** should develop graduate-entrepreneur loan products with alternative collateral arrangements (group guarantees, equipment leasing or credit guarantees) bundled with advisory support.

4. **Entrepreneurship development agencies** (e.g., SMEDAN and state enterprise agencies) should provide post-graduation coaching and market-linkage services coordinated with university incubators.

5. **Development partners** should fund mentorship networks and incubation infrastructure in the North-East, together with rigorous evaluations of practical entrepreneurship programmes.

6. **Graduate entrepreneurs** should actively seek mentorship and incubation opportunities, begin with low-capital and market-tested ventures, and use cooperative models to pool capital and share risk.

Declarations

Conflict of interest: The authors declare no conflict of interest.

Data availability: The anonymised data set is available from the corresponding author on reasonable request.

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