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Entrepreneurship Education and Graduate Labour-Market Outcomes in Nigeria: Longitudinal Evidence and Implications for Economic Diversification

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Abstract

Entrepreneurship education is a higher education solution to the problem of unemployment in Nigeria, yet there is limited evidence of labor-market consequences. This study examined associations between degree-level entrepreneurship education and post-NYSC paid employment, business ownership, and employer status. Ten states were included within a four wave observational cohort. With 9,304 baseline respondents, 1,271 (13.66% retention; 86.34% attrition) reached endline of which 1,244 were exposure-classifiable. Outcomes were evaluated using multivariable logistic regression and sensitivity analyses; employee count was evaluated using negative-binomial regression. It was not associated with paid employment (N = 970; OR = 1.073, 95% CI [0.783, 1.470], p = .661) or business ownership (N = 970; OR = 1.236, 95% CI [0.931, 1.642], p = .143), with stable sensitivity results. Employer status showed a positive, non-significant association in the parsimonious model among business owners (N = 404; OR = 1.561, 95% CI [0.943, 2.584], p = .083). Expanded model was nominally significant (OR = 1.755, p = .047), but sensitivity results were mixed and the bootstrap interval crossed the null. Entrepreneurship education was not significantly associated with employee count (IRR = 1.484, 95% CI [0.893, 2.468], p = .128). No strong relationship is found between degree-level entrepreneurship education and paid employment or business entry. The good news about the positive employer-status scaling is that it is not a proof of a proven scaling mechanism, but rather a hypothesis generation activity. The economic-diversification implications, therefore, are interpretive, and do not represent a quantifiable impact on Nigeria's overall economy.

Keywords: entrepreneurship education; graduate employment; job creation; National Youth Service Corps; economic diversification; Nigeria.

Vol. 2, No. 1, 2026 - Kwararafa University Journal of Multidisciplinary Research and Innovation
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Introduction

Graduate enterprise development is a policy issue for Nigeria because of the labour-market and diversification-related issues, but the economic problem is more specific than merely reliance on oil. After the GDP rebase of 2019, the majority of domestic production came from non-oil activities and the petroleum heavy merchandise exports continued to be significant (National Bureau of Statistics [NBS], 2025a, 2025b). Labour-market structure is also very self-employment oriented with the Nigeria Labour Force Survey (2023) reporting that 73.1% of employed persons were engaged in self-employment or farming activities while a much smaller proportion (22.2%) were engaged in wage employment in Q4 2022. The establishment of more graduate-owned businesses does not necessarily result in the creation of productive employment or a diversified export portfolio. The question that is more policy relevant is whether graduate enterprises can persist, create jobs and be productive in non-oil activities (Aderemi et al., 2023; Awe et al., 2023; Young, 2024).

In this policy landscape entrepreneurship education is an emerging higher education intervention in Nigeria. National policy, through the integration of compulsory entrepreneurship courses in the university curriculum, has been aimed at putting into place the opportunity recognition, business development and managerial skills (Oyinlola et al., 2024). The quality of implementation, the practice, and the linkages between universities and industries are not uniform, however (Olu et al., 2023; Oyinlola et al., 2024). It is thus difficult to accept the notion that exposure to the course is enough. The findings from Nigeria further indicate that impact on entrepreneurial attitudes could be lessened or different over time, highlighting the importance of separating the impact of curriculum exposure from the actual post-graduation outcomes (Egbetokun et al., 2024).

Another empirical deficit in entrepreneurship education research is that it focuses mostly on intention, attitude or self-efficacy, but not actual outcomes in the labour market. It is generally found that there is positive, although small, correlation between entrepreneurial intention and psychological factors in entrepreneurship in the general context of the literature on the subject, which is expressed in the form of a meta-analysis (Martínez-Gregorio et al., 2021; Zhang et al., 2022). But, intention is not business entry, business entry is not employment creation. Employability, entrepreneurial outcomes and enterprise capability have been more in the spotlight in recent years, but are not synonymous and dependent on the context (Arendt et al., 2025; Decker-Lange et al., 2024; Simba et al., 2025). This distinction is particularly relevant in Nigeria, where a high proportion of the population are self-employed and there are curricular differences in both the level and type of instruction, and external factors beyond the educational system which limit teaching.

This study fills that void with an observational cohort of Nigerian university and polytechnic graduates who were surveyed at four points in time around the National Youth Service Corps (NYSC) programme. Data were originally collected longitudinal, but the principal analysis conducted is not a repeated measures longitudinal analysis. Instead, degree-level entrepreneurship-education exposure measured at baseline is related to endline labour-market outcomes. The study does not however make the claim that the four waves of the data were fully utilised by virtue of growth curve modelling or fixed effects modelling or other modelling of the longitudinal data. It aims to provide an estimate of adjusted associations between

Vol. 2, No. 1, 2026 - Kwararafa University Journal of Multidisciplinary Research and Innovation
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entrepreneurship education at the degree level and three well-defined outcomes following NYSC, which are: paid employment, business ownership, and being an employer among entrepreneurs. Economic diversification is not studied as a policy implication of enterprise participation in different sectors, but rather as an interpretation arising from the study of enterprise participation across sectors.

Theoretical Framework and Hypotheses

There is a main mechanism for why entrepreneurship education is expected to have an impact, and that is through human capital theory. Education can be seen as an investment that leads to an increase in productive knowledge and skills that can, in turn, lead to returns in the labour market (Becker, 1964). In entrepreneurship, the appropriate returns might be opportunity identification, fund management principles, planning, market evaluation, sources coordination and managerial ability. This mechanism is supported by the evidence of entrepreneurial competencies being related to enterprise performance; however, it does not demonstrate that a compulsory course necessarily leads to the development of entrepreneurial competencies (Liu et al., 2024; Soomro et al., 2025).

The association between the same exposure and paid work/employer status is not entirely due to human capital. The signaling theory also suggests that education can influence paid employment through signaling and valued credential/training signals (Spence 1973). If the exposure is widespread or if employers have limited access to perceive the quality of the entrepreneurship course, then a compulsory entrepreneurship course will offer only a weak differentiating signal. The second qualification is added by institutional theory, which speaks of the conversion of education to action in a broader institutional context of finance, regulation, infrastructure, market demand and institutional support (North, 1990). So, ability to enter into business could be largely dependent on the opportunities beyond the curriculum, whereas post-entry employer status could be more closely associated with organisational and managerial ability. In this latter case, the proposition is not directly assessed in the present study, due to the lack of managerial mechanisms being measured.

The framework created is split into three outcomes instead of having them form one. Paid employment is defined as the condition of having a paid job as an employee; business ownership is defined as the condition of having a business; and employer status is defined as whether an endline business owner has at least one employee other than the respondent. The hypotheses are associational as entrepreneurial exposure to entrepreneurship education was not randomly allocated.

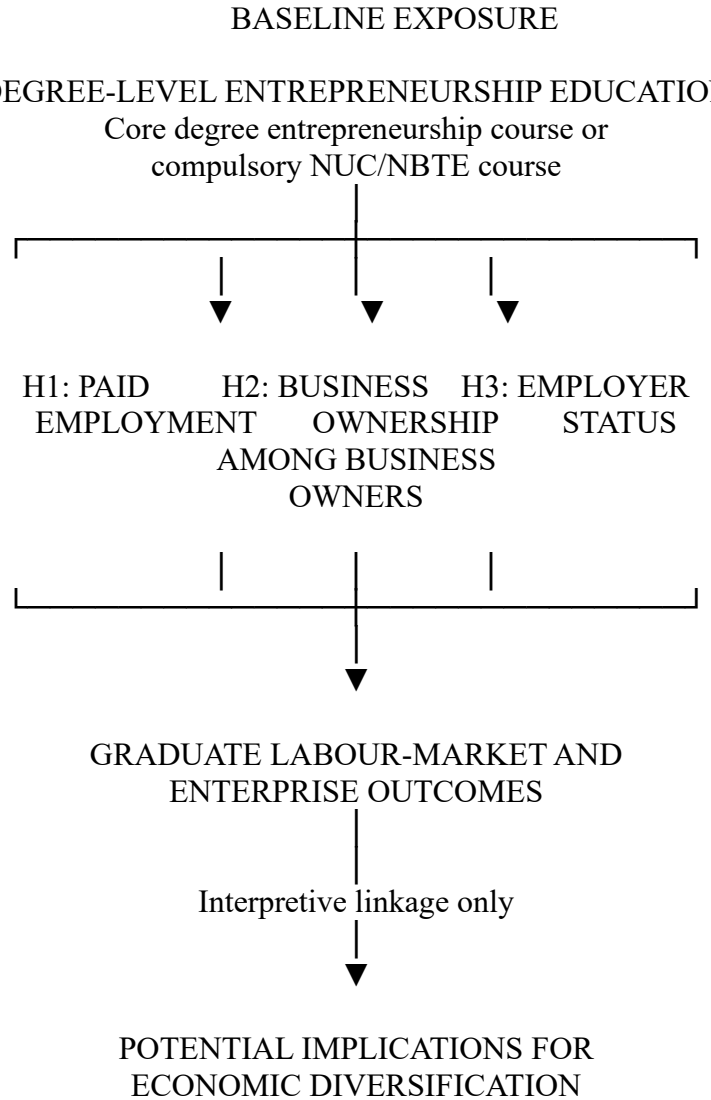
H1: Degree-level entrepreneurship education is significantly associated with graduates' likelihood of paid employment after NYSC.

H2: Degree-level entrepreneurship education is significantly associated with graduates' likelihood of business ownership after NYSC.

H3: Degree level entrepreneurship education is strongly related to being an employer among the graduates who are business owners after NYSC.

Vol. 2, No. 1, 2026 - Kwararafa University Journal of Multidisciplinary Research and Innovation
Pub. Link: https://aa.unij.co.uk/index.php/kujmri/issue/view/6 - E- ISSN: 3156-5492 | P- ISSN: 3156-5514

Figure 1. Revised Analytical Framework



Note. The focus exposure is entrepreneurship education. The models used to analyse paid work and business ownership/employer status are outcome-specific. Secondary analyses are the number of new-enterprises and employees. While the relationship between graduate labour-market and enterprise outcomes and economic diversification is a descriptive rather than a causal pathway at the individual level or macro level.

Subjects/Materials and Methods

Study Design and Data Source

This study did a secondary observational analysis of the *Pooled Longitudinal Dataset on the Assessment of an Apprenticeship Based Entrepreneurship Intervention in Nigeria* (Olofinyehun & Egbetokun, 2023). The following methodological publication outlines four surveys conducted

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at approximately six-month intervals: baseline (November 2020), Midline 1 (April 2021), Midline 2 (October 2021) and endline (April 2022) (Olofinyehun et al., 2023). The pre-service characteristics and education exposure were measured at baseline while the post-service employment and enterprise outcomes were measured at endline. The temporal ordering eliminates concurrent measurement ambiguity, however it is not a causal design for entrepreneurship education but is rather rather a reduction.

Setting, Population and Analytical Samples

The source population was the university and polytechnic graduates who were deployed to serve their compulsory military service in the Batch B 2020 in 10 states from 5 geopolitical zones. Only two states were sampled per zone with the exception of the North-East due to its insecurity (Olofinyehun et al., 2023). There were 21,940 individual respondents in the pooled data set. Baseline included 9,304 respondents. There were 1,300 endline records in the statistical file, with 19 endline records missing state and not linked to baseline. The linkage of respondents from baseline to endline then yielded 1,271 respondents with 13.66% retaining and 86.34% attrition. Twenty-seven respondents were not able to be classified, and a descriptive analytical sample of 1,244 was created. Analysis of data are complete-case analyses, which were further reduced by missingness in sample size across the models.

Measures and Operational Definitions

The baseline self-report was used to create the degree-level entrepreneurship education. EE = 1 if a respondent declared that he or she have taken any course that is considered a core entrepreneurship course or (b) a Compulsory Entrepreneurship Elective under NUC/ NBTE arrangements in the degree programmes studied. If the respondent indicated that they had not taken an entrepreneurship course before or indicated that they had taken one before but explicitly noted none of the core or required degree level entrepreneurship course, EE = 0. One-off events and privately arranged training were not considered as the focal exposure, nor were optional school electives. This binary operationalisation has the advantage of being more specific on the construct than "any training" but fails to capture course duration, pedagogy, intensity, quality and competence acquired and is thus susceptible to exposure misclassification.

For the purpose of this analysis, paid employment (H1) was denoted as 1 if the endline respondent reported having a paid job at the time of the survey (and not a business) and 0 if they did not. Business ownership (H2) was coded 1 if the respondent had an endline business, and 0 if he/she did not have one. Employer status (H3) criteria was applied in the endline business owners and meant that they had at least one other person who worked for them. Endline business ownership was a secondary transition outcome limited to respondents with no business ownership at baseline, and a measure of entry between baseline and endline.

Among all the endline business owners the number of employees was considered as a secondary outcome. Owners that reported no employees were assigned a count of 0 and those who reported employees had their positive count of employees recorded. This prevents analysis of just the positive counts as a regular untruncated count process. In count modelling, the previously mentioned value of 100,000 has been considered as implausible and discarded. One all-graduate sensitivity outcome (job-creating business) is coded as 1 if a graduate was both the owner of an

Vol. 2, No. 1, 2026 - Kwararafa University Journal of Multidisciplinary Research and Innovation
Pub. Link: https://aa.unij.co.uk/index.php/kujmri/issue/view/6 - E- ISSN: 3156-5492 | P- ISSN: 3156-5514

endline business and employed at least one other worker; coded as 0 otherwise. The sensitivity analysis is not restricted to post-exposure business ownership, but does include business entry and employer status as a composite outcome.

To account for prespecified covariates, age, sex, academic discipline, class of degree, background in business among the parents, and baseline business ownership and state were included in H1 and H2. State was modelled using fixed effects. Due to the smaller size of the employer-status subgroup and the few outcome cells within the academic-discipline and degree-class dimensions for this subgroup, the conservative H3 model employed a "parsimonious" adjustment set of age, sex, parental business background, and baseline business ownership and state. The discipline and degree class was added to the expanded H3 and this specification was kept for a sensitivity analysis.

Missing Data, Attrition and Weighting Diagnostics

No imputation was performed for exposure and primary outcomes. For the purpose of the models, the main ones are H1 and H2, complete cases of the specified covariates were then used (N = 970; 78.0% of the 1,244 exposure-classified cohort). The H3 model was conservative (404 of 510 business owners, 79.2%); and the expanded H3 model was used with 398. For the 1,244-person cohort, less than 2% had a missing baseline age, less than 2% had a missing parental business background, 5.9% had a missing baseline business ownership and less than 2% had a missing other included covariate.

A pragmatic expanded-sample sensitivity analysis was performed where missing categorical covariates were explicitly coded as missing, and missing age was coded as the cohort median, but there was an age-missing indicator. This analysis is performed to determine whether the complete-case restriction has a significant effect on the focal coefficient, but is not intended to be a stand-in for multiple imputation.

Attrition weighting was estimated from respondents with complete information on the exposure and the covariates (N = 6,908). A logistic response model was developed for predicting baseline-to-endline retention from entrepreneurship education, age, sex, discipline, degree class, parental business background, baseline business ownership and state. The area under the curve (AUC) in the model was .653. The mean of the inverse-probability retention weights among the 970 retained complete cases was 1.003 with a 99th percentile equal to 2.168, a maximum equal to 12.057, and an effective sample size of about 506 cases. The absolute maximum standardised difference between the weight sample and the baseline target decreased from .285 prior to the weighting to .055 following the weighting. The results did not change with trimming at the first and 99th percentiles.

Within the 970 cases for which all of the degree-level entrepreneurship education controls are present, propensity scores are estimated using the same set of H1/H2 covariates plus state fixed effects. The maximum value of inverse-probability exposure weights was 3.291 and the effective sample size was around 865 for the stabilised inverse-probability exposure weights. The maximum absolute standardised mean difference (SMD) was reduced from .238 pre-weighting to .039 post-weighting across 31 covariate/dummy contrasts, and none of which exceeded .10.

Vol. 2, No. 1, 2026 - Kwararafa University Journal of Multidisciplinary Research and Innovation
Pub. Link: https://aa.unij.co.uk/index.php/kujmri/issue/view/6 - E- ISSN: 3156-5492 | P- ISSN: 3156-5514

Weighting does not remove unmeasured confounding (Chang & Stuart, 2022) and these diagnostics are useful to see that the balance on measured covariates is improved.

Statistical Analysis

The cohort and outcomes were described using descriptive statistics. Multivariable logistic regressions were used to determine H1 and H2, with degree-level entrepreneurship education as the key exposure of interest, prespecified covariates and state fixed effects. The parsimonious logistic specification outlined above was used by H3. Odds ratios (ORs), 95% confidence intervals (CIs) and two-sided p values are presented. Where noted, McFadden pseudo-R^2 statistics are considered only descriptive fit statistics and not percentages of variance in the outcome explained.

Stabilised attrition weighting, propensity-score weighting, the expanded-sample missingness sensitivity analysis and state-clustered sandwich standard errors were all included in the robustness analyses. The latter are reported with caution as there were only 10 state clusters. Also compared was the expanded H3 model with the parsimonious model and with the previously prespecified non-parametric bootstrap, with the latter's confidence interval for the expanded H3 coefficient crossing the null.

The previous exploratory multinomial pathway and moderation analyses were eliminated from the primary inferential design since they did not need to test H1-H3 and added further assumptions, such as independence-of-irrelevant-alternatives assumption in multinomial logit, that were not necessary for this primary research question, and did not enhance the answer to the primary research question.

Negative-binomial regression was used to model numbers of employees for all business owners. The average number of employees was calculated as 0.89, the variance of 3.61 does not allow for a Poisson specification, the estimated dispersion parameter was 3.713 ($p < .001$) favoring a conservative model (Kenne Pagui et al., 2022). The threshold for statistical significance was set at $\alpha = .05$, however, effect size, confidence intervals and consistency on sensitivity analyses were given priority when interpreting the results. The analyses were replicated in Python using the packages: pandas and statsmodels.

RESULTS

Sample Profile and Descriptive Outcomes

A total of 1,244 linked graduates were classified into the categories of exposure. Of these, 43.3% (539) had no degree-level entrepreneurship education and 56.7% (705) had degree-level entrepreneurship education. The mean age of respondents with valid data was 25.63 years (SD = 2.31). The paid employment rate among endline graduates was 27.0%, while 41.0% of them were involved in business. The 150 business owners (29.4%) who were employer/employees had at least one employee other than themselves. The difference in the descriptive categories between owner of a business and an employer is significant, as most businesses owned by the graduates had no other employee by the end line.

Vol. 2, No. 1, 2026 - Kwararafa University Journal of Multidisciplinary Research and Innovation
Pub. Link: https://aa.unij.co.uk/index.php/kujmri/issue/view/6 - E- ISSN: 3156-5492 | P- ISSN: 3156-5514

Table 1. Sample Characteristics and Principal Outcomes

Variable	n	% / Mean (SD)
Final analytical cohort	1,244	100.0
Age, years	1,107	25.63 (2.31)
Male	689	55.7
Female	548	44.3
Degree-level entrepreneurship education	705	56.7
No degree-level entrepreneurship education	539	43.3
Paid employment	336	27.0
Business ownership	510	41.0
Employer among business owners	150/510	29.4
Full-time employment among paid employees	238/336	70.8
Pension benefit among paid employees	106/336	31.5
Health-insurance benefit among paid employees	100/336	29.8

Note. Percentages are based on the appropriate valid denominator. Age n is the age cohort of the cohort that has been exposed.

H1: Paid Employment

H1 was not an option. In the prespecified adjusted model (N = 970), degree-level entrepreneurship education was not associated with paid employment (OR = 1.073, 95% CI [0.783, 1.470], p = .661). However, state-clustered inference was not significant (p = .489). Propensity-weighted and expanded-sample missingness sensitivity estimates were also non-significant, as were attrition-weighted estimates (Table 2). It is not a failure to find a strong link in this particular population but rather an indication that there is no employment measurable value from entrepreneurship education in other groups or via other means.

H2: New-Enterprise Seeds

H2 was not supported. In the full adjusted model (N = 970; OR = 1.236, 95% CI [0.931, 1.642], p = .143), degree-level entrepreneurship education was positively but not significantly associated with endline business ownership. This conclusion was not affected by state-clustered, attrition-weighted, propensity-weighted and expanded-sample sensitivity estimates.

For those individuals who were not business owners at baseline, the conservative new entry model also did not show a statistically significant association (N = 477; OR = 1.181, 95% CI [0.783, 1.781], p = .428). Therefore, there is no strong evidence that the binary degree-level exposure predicted entrance into business in the window of the study from the current ownership group or the baseline-non-owner transition analysis.

Vol. 2, No. 1, 2026 - Kwararafa University Journal of Multidisciplinary Research and Innovation
Pub. Link: https://aa.unij.co.uk/index.php/kujmri/issue/view/6 - E- ISSN: 3156-5492 | P- ISSN: 3156-5514

H3: Employer Status and Employment Scale

A positive but statistically marginal pattern resulted from H3. Among the conservatives parsimonious model (N = 404), entrepreneurship education was statistically associated with an increased odds of being an employer, but the confidence interval contained the null (OR = 1.561, 95% CI [0.943, 2.584], p = .083; average marginal effect approximately 8.0 percentage points). State-clustered inference was also non-significant at the 5% level (OR = 1.561, 95% CI [0.968, 2.517], p = .067), and attrition weighting produced OR = 1.593 (95% CI [0.918, 2.765], p = .098). Propensity weighting (OR = 1.728, 95% CI [1.016, 2.937] p = .043) was nominally significant, but not consistently strong evidence.

The larger N (N = 398; OR = 1.755, 95% CI [1.006, 3.061], p = .047) reproduced the previous estimate, with the additional parameters of academic discipline and degree class but unstable outcome cells that resulted in a non-parametric bootstrap confidence interval that crossed 1 (approximately 0.968-3.617). The expanded-sample missingness sensitivity model also failed to reach conventional significance (N = 510; OR = 1.500, 95% CI [0.948, 2.374], p = .083). H3 is treated as not confirmed (under the conservative primary specification).

The signal is defined using two secondary analyses. An all-graduate outcome with a code of 1 if the graduate both owned a business and had another worker employed in the business was associated positively in the full complete case model (N = 970; OR = 1.731, 95% CI [1.076, 2.786] p = .024). This does not limit the sample to endline business owners, but is a combined measure of business entry and employer status and thus measures a different measure than H3.

Second, when the number of employees was defined for all business owners, including a zero for business owners who explicitly stated that they employed no employees, the negative-binomial model failed to demonstrate a statistically significant entrepreneurship-education association (N = 404; IRR = 1.612, 95% CI [1.041, 2.506], p = .032). The evidence therefore does lend greater support to a possible extended-margin pattern than to the amount of employment, but even in the extended-margin interpretation it is hypothesis generating.

Table 2. Primary Hypothesis Tests and Reviewer-Focused Sensitivity Analyses

Outcome/model	N	Estimate	95% CI	p	Key sensitivity evidence	Inference
H1 Paid employment	970	OR = 1.073	0.783-1.470	.661	Cluster p=.489; attrition OR=1.003, p=.989; PS OR=1.064, p=.699; missingness OR=1.062, p=.668	Not supported
H2 Business ownership	970	OR = 1.236	0.931-1.642	.143	Cluster p=.186; attrition OR=1.260, p=.134; PS OR=1.202, p=.210; missingness OR=1.070, p=.595	Not supported
New-enterprise entry, baseline non-owners	477	OR = 1.181	0.783-1.781	.428	Parsimonious transition model	Not significant

Vol. 2, No. 1, 2026 - Kwararafa University Journal of Multidisciplinary Research and Innovation
Pub. Link: https://aa.unij.co.uk/index.php/kujmri/issue/view/6 - E- ISSN: 3156-5492 | P- ISSN: 3156-5514

H3 Employer status, parsimonious	404	OR = 1.561	0.943-2.584	.083	Cluster p=.067; attrition OR=1.593, p=.098; PS OR=1.728, p=.043	Not supported at .05; suggestive
H3 Expanded full-control sensitivity	398	OR = 1.755	1.006-3.061	.047	Bootstrap CI approximately 0.968-3.617; missingness sensitivity p=.083	Bootstrap-sensitive
Job-creating business, all graduates	970	OR = 1.731	1.076-2.786	.024	Composite outcome avoids conditioning only on business owners	Secondary sensitivity
Employee count among business owners	404	IRR = 1.484	0.893-2.468	.128	NB dispersion α=3.713, p<.001	Not significant

Note. IRR = incidence rate ratio; OR = odds ratio; CI = confidence interval; PS = propensity score weighting. These are state-clustered estimates and are not definitive small-cluster inference because they use only ten state clusters and are therefore sensitivity checks.

Selection and Weighting Diagnostics

Interpretation is an issue of severity of attrition. Of the 9304 baseline respondents, 1271 were linked to endline, meaning that 8033 baseline respondents were not observed at endline. Baseline exposure to entrepreneurship education was not randomly distributed across endline responses in the complete baseline, though it was related to the retention (OR = 1.202, p = .012).

The observed covariate balance significantly increased with weighting, and the effective sample size decreased to approximately 506 due to information loss from the differential retention. Propensity weighting also resulted in an improved balance of exposure groups, but neither weighting technique takes into account unmeasured factors that could explain retention or exposure.

Table 3. Attrition, Missingness and Weighting Diagnostics

Diagnostic	Result	Interpretive implication
Baseline to endline linkage	1,271/9,304 retained (13.66%); 86.34% attrition	Major threat to representativeness and precision
H1/H2 complete-case sample	970/1,244 (78.0%)	Model-specific complete-case restriction
H3 parsimonious sample	404/510 business owners (79.2%)	Smaller conditional sample; sparse cells require caution
Attrition response model	N=6,908; AUC=.653	Measured baseline factors predict retention to a modest extent

Vol. 2, No. 1, 2026 - Kwararafa University Journal of Multidisciplinary Research and Innovation
Pub. Link: https://aa.unij.co.uk/index.php/kujmri/issue/view/6 - E- ISSN: 3156-5492 | P- ISSN: 3156-5514

Attrition-weight balance	Max absolute standardised difference .285 to .055	Improved balance on measured baseline covariates
Attrition-weight ESS	Approximately 506 of 970 retained complete cases	Weight variability reduces effective information
Propensity-score balance	Max absolute SMD .238 to .039; none >.10	Good measured-covariate balance after weighting
Propensity-weight ESS	Approximately 865 of 970	Moderate information loss
State clustering	10 state clusters	Cluster-robust SEs treated as sensitivity only

Sectoral Pattern and Economic-Diversification Context

Graduate owned enterprises reported in various agro-allied activities, food processing, ICT, education, construction, fashion, energy and other services. The previously calculated sectoral dispersion index was slightly larger for entrepreneurship-educated owners (1-HHI = .8413; normalised Shannon = .790) than for non-exposed owners (1-HHI = .8186; normalised Shannon = .776). These indices are non-numeric.

They fail to prove that entrepreneurship education brings about sectoral diversification and individual graduate records do not show any impact on sectoral GDP composition or export diversification. The macroeconomic linkage is thus maintained as policy context: Nigeria's production structure is much lower in petroleum than its merchandise exports; and diversified, employment-generating enterprises can potentially contribute to the broader non-oil activity in the future (Awe et al., 2023; Okonta et al., 2024; Young, 2024).

Discussion

Principal Findings

The new analysis gives three conclusions. Second, the association between entrepreneurship education and paid employment was weak and did not hold true for every category of entrepreneurs.Third, entrepreneurship education is not strongly linked to having a paid job after NYSC. Secondly, it did not strongly relate to the existing business ownership or new enterprise creation among the baseline non-owners. Third, the coefficient for employer status was always positive in sign, and was quite sensitive to model specification, weighting, missing data, and bootstrap inference.

It is not that entrepreneurship education has been demonstrated to lead graduates to become employers, but that there is a possible post-entry employer signal in the data that warrants further testing using more precise measurement and retention of graduates.

Vol. 2, No. 1, 2026 - Kwararafa University Journal of Multidisciplinary Research and Innovation
Pub. Link: https://aa.unij.co.uk/index.php/kujmri/issue/view/6 - E- ISSN: 3156-5492 | P- ISSN: 3156-5514

Paid Employment and Business Entry

The results of the H1 are in line with the idea that entrepreneurial human capital and conventional employability are linked but different. While communication, initiative and problem-solving skills can be developed through entrepreneurship education, employment requires an employer that is willing to hire, a recruitment process that is receptive, and relevant qualifications and institutional environment (Decker-Lange et al., 2024). The above data are not a measure of these pathways. Therefore, the null association should not be interpreted as an assertion that entrepreneurship education does not help in employability; rather, it suggests that the binary level of exposure to entrepreneurship education (degree level) was not associated with realised paid employment in the adjusted cohort models.

The H2 outcome also warns against making an assumption of a straight on to start-up sequence. The intent to enter into a programme is the context in which the evidence is typically situated in a meta-analysis and the effects are dependent on programme design and context (Martínez-Gregorio et al., 2021; Zhang et al., 2022). The implementation of the strategy and exposure to it in practice, as evidenced in Nigeria also, is not uniform (Olu et al., 2023; Oyinlola et al., 2024). Possible constraints are finance, market conditions and institutions but were not directly estimated in the current study as mediators. They should therefore be considered as context explanations, to be tested in future studies, not as explanations of the null H2 estimate.

Employer Status as a Hypothesis-Generating Signal

The pattern for Employer is of particular interest because it uncouples actions to enter the business from actions to employ people. Human-capital theory indicates that planning, coordination, and managerial skill might be more important when the business is established, while institutional features might be more important in determining whether or not entry actually takes place. This is plausible because studies have shown that there is a link between entrepreneurship education or entrepreneurial competence and enterprise performance (Ayatse, 2024; Liu et al., 2024; Soomro et al., 2025).

In the current study, however, these competencies are not measured as mediators and the revised H3 estimate is not conventionally significant in the conservative model. The mechanism is thus still a speculative explanation, rather than a known causal pathway.

Another consideration is Selection. Business ownership is itself an endline state, and can thus be a source of selection bias or collider bias if entrepreneurship education and unmeasured determinants affect business ownership. The sensitivity of the all-graduate job-creating-business does not have that restriction and was still positive but, of course, the estimand is different, incorporates entry and employer.

The findings, combined with the non-significant employee-count model, confirm the need for continued research on the effects of entrepreneurship education on the extensive margin of employment creation but do not warrant any claims that entrepreneurship education has been shown to have enterprise-scaling impacts.

Vol. 2, No. 1, 2026 - Kwararafa University Journal of Multidisciplinary Research and Innovation
Pub. Link: https://aa.unij.co.uk/index.php/kujmri/issue/view/6 - E- ISSN: 3156-5492 | P- ISSN: 3156-5514

Policy and Economic-Diversification Implications

Policy implications ought to be more specific than a generic prescription for entrepreneurship education as a solution to graduate unemployment. The most defensible suggestion is to consider the quality of the curriculum and the post-entry skills of the students and not just the completion of the course. Monitoring of the programme may be through enterprise projects, mentoring, financial readiness, market linkages, venture survival, employer transition, employee retention, and job quality.

Such policies would provide some indication of whether education produces useful skills even if it is not directly associated with entry to business. This is in line with the evidence that the outcomes of entrepreneurship education are influenced by pedagogy, institutional context, and gained competencies (Oyinlola et al., 2024; Simba et al., 2025).

The study does not quantify the national economic diversification, export transformation or SDG 8 progress. The individual-level models can't isolate a micro-to-macro causal effect; however, the graduate-firm-level models might be relevant for other sectors, aside from the oil industry. Therefore, the sectoral breadth in the cohort should be considered as descriptive context and a possible avenue for further research but not evidence of entrepreneurial education changing the structure of the Nigerian economy. Similarly, being an employer does not mean a decent job, since wages, contracts, working time, and working conditions were not examined.

Limitations

There were a number of significant limitations to the study. Most severe is attrition: 86.34% of baseline respondents did not link to endline. However, even though attrition weighting adjusted for imbalance on measured baseline variables, there is no way to reconstruct information on unmeasured differences between retained and lost respondents and the diminution of the effective sample size is a reminder of the information lost.

Second, the cohort is not statistically representative of all those who have graduated from schools in Nigeria. It consists of an observational sample of NYSC across ten states and is not impacted on by the North-East or age based exemption and involves the impact of migration and traceability due to NYSC mobilisation.

Third, entrepreneurship education is a dichotomous self-reported exposure; that is, it doesn't reflect quality of courses, length of exposure, pedagogy used, assessment, and the content or competence gained.

Fourth, because of the observational design, there is residual and unmeasured confounding even after adjustment for the covariates and weighting.

Fifth, complete-case estimation may lead to bias in the case of informative missingness, and this is lessened, but not eliminated, by the expanded-sample sensitivity analysis.

Sixth, employer status is dependent on endline business ownership, and is subject to post-exposure selection, the all-graduate composite sensitivity can compensate for this to a certain degree, but it is not a direct measure of employer status.

Vol. 2, No. 1, 2026 - Kwararafa University Journal of Multidisciplinary Research and Innovation
Pub. Link: https://aa.unij.co.uk/index.php/kujmri/issue/view/6 - E- ISSN: 3156-5492 | P- ISSN: 3156-5514

Seventh, the outcome of an employee count is crude and is not on the same basis as full-time equivalents, wages, contracts, survival or job quality.

Lastly, no measure of incomes, firm survival to endline, productivity, profits, use of finance or national diversification outcomes are measured. The results should therefore be generalised to the sample of the NYSC cohort only, and interpreted as associations rather than cause.

CONCLUSION

This study uses baseline entrepreneurship education exposure and endline labour-market outcomes of a four-wave cohort of the NYS, and doesn't find strong evidence of a relationship between entrepreneurship education at the degree level and paying work or business ownership. The positive association with employer status is less robust than suggested in the previous manuscript: Although there is no statistical support in the conservative primary model, the signal is variable across robustness specifications, and some sensitivity analyses continue to show a positive signal. There wasn't a significant relationship between entrepreneurship education and number of employees in business owners either. The right conclusion is thus conservative. The analysis in this study does not provide evidence of a scaling mechanism nor of a causal impact on job creation for degree-level entrepreneurship education.

The result provides supporting evidence for further investigation of curriculum quality and post entry enterprise support such as mentoring, financial readiness, access to markets, to venture survival and job quality for policy. The findings suggest only a micro level policy implication for economic diversification – the development of stronger graduate enterprises can complement the spread of non-oil economic activities; there is no measure or evidence of impact on Nigeria's aggregate diversification.

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Vol. 2, No. 1, 2026 - Kwararafa University Journal of Multidisciplinary Research and Innovation
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