
DIGITAL ENTREPRENEURSHIP EDUCATION AND YOUTH ECONOMIC EMPOWERMENT: THE MEDIATING ROLES OF DIGITAL SKILLS AND ENTREPRENEURIAL SELF-EFFICACY AMONG NIGERIAN TERTIARY STUDENTS

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ABSTRACT

Rising youth unemployment and rapid digitalisation have pushed policymakers and educators to ask whether entrepreneurship education that is delivered and applied through digital tools can translate into real economic gains for young people. This study examined the relationship between digital entrepreneurship education (DEE) and youth economic empowerment (YEE) among Nigerian tertiary students, and tested whether digital skills (DSK) and entrepreneurial self-efficacy (ESE) transmit this relationship. A cross-sectional survey design was applied to an illustrative sample of 320 students drawn from computer science/ICT, business/economics, and education programmes in North-East Nigeria. Reliability was acceptable for all scales (Cronbach's $\alpha = .79-.86$). DEE was positively associated with YEE ($\beta = .46, p < .001$), and a serial mediation model with bias-corrected bootstrapping showed that 43% of this total effect operated indirectly, primarily through ESE and through the sequential path $DSK \rightarrow ESE$. Students with high DEE exposure reported markedly higher empowerment than those with low exposure, $F(2, 317) = 33.08, p < .001, \eta^2 = .17$. The findings suggest that digital entrepreneurship curricula should deliberately build confidence and applied digital competence rather than transmit business knowledge alone. Policy and curriculum recommendations are provided.

KEYWORDS: Digital Entrepreneurship Education, Youth Economic Empowerment, Digital Skills, Entrepreneurial Self-Efficacy, Serial Mediation.

1. INTRODUCTION

Youth economic exclusion remains one of the most persistent development problems of the decade. The International Labour Organization (ILO, 2022, 2024) reports that, despite a post-pandemic recovery in headline youth unemployment, roughly one in five young people worldwide are still outside employment, education, or training, and that young people in low- and middle-income economies face the weakest transitions to decent work. In Nigeria and across Sub-Saharan Africa, the youth cohort is large and growing faster than formal-sector job creation, so self-employment and new venture creation are increasingly treated as realistic pathways to income rather than as fallback options (Global Entrepreneurship Research Association [GERA], 2023).

At the same time, digital technologies have changed what it means to start and run a business. Online platforms, mobile payments, social commerce, and low-cost software lower the capital needed to launch ventures and widen access to markets (Elia et al., 2020; Sahut et al., 2021). Researchers describe this shift as a "digital entrepreneurship ecosystem" in which technology both creates opportunities and reshapes the entrepreneurial process itself (Beliaeva et al., 2020; Elia et al., 2020). Education systems have been pushed to respond. The COVID-19 disruption in particular forced universities to redesign entrepreneurship teaching around digital delivery and digital venture-building tasks (Liguori & Winkler, 2020; Secundo et al., 2021).

Despite this momentum, evidence linking digital entrepreneurship education to *economic empowerment outcomes*, rather than to intentions alone, is still thin, especially in Northern Nigeria. Most studies stop at entrepreneurial intention or mindset (Cui et al., 2021; Iwu et al., 2021; Wardana et al., 2020), and few examine the psychological and skill-based mechanisms that might carry classroom learning into income, assets, and decision-making power. This study addresses that gap. It asks: (a) Is DEE associated with YEE among tertiary students? (b) Do digital skills and entrepreneurial self-efficacy mediate that association, singly or in sequence? and (c) Do empowerment levels differ across levels of DEE exposure?

2. Literature Review and Hypotheses

2.1 Digital entrepreneurship education

Entrepreneurship education has moved from lecture-based transmission of business knowledge towards experiential, action-based pedagogy in which students create real value for others (Hägg & Gabrielsson, 2020; Lackéus, 2020; Mukesh et al., 2020). Bell and Bell (2020) argue that experiential delivery works best when it is grounded in explicit educational theory and sequenced from observation to practice. Digital entrepreneurship education extends this logic by embedding digital tools (e-commerce platforms, social-media marketing, mobile finance, and basic app or website development) into the venture-creation process. Ratten and Jones (2021) note that entrepreneurship and management education is increasingly shaped by technology, yet that the field lacks consistent outcome measures. In this study, DEE is defined as the extent to which a student has been taught, and has practiced, launching or running a venture with digital tools.

2.2 Youth economic empowerment

Youth economic empowerment refers to young people's capacity to earn, save, make financial decisions, and take part in economic activity on terms they control. It therefore goes beyond employment status to include income generation, financial agency, access to markets, and perceived economic security. Digital venturing appears to support such outcomes: Cueto et al. (2022) found that young entrepreneurs used digital innovations to keep micro, small, and medium enterprises operating through economic disruption, and Beliaeva et al. (2020) describe how digital technologies widen entrepreneurial opportunity across innovation ecosystems.

2.3 Mediating mechanisms and hypotheses

Two mechanisms are theoretically prominent. First, education can raise *digital skills*, the applied competence needed to use digital tools for business tasks, which Kraus et al. (2022) identify as a central requirement of organisational and individual digital transformation. Second, education can build *entrepreneurial self-efficacy*, the belief that one can successfully perform entrepreneurial tasks. Wardana et al. (2020) showed that entrepreneurship education shapes entrepreneurial mindset partly through attitude and self-efficacy, and Jena (2020) reported that favourable attitudes towards entrepreneurship education predict entrepreneurial intention. Skills should also strengthen self-efficacy, because mastery experiences are the strongest source of efficacy beliefs. On this basis, the following hypotheses are proposed:

H1: DEE is positively related to YEE.

H2: DEE is positively related to DSK (H2a) and ESE (H2b).

H3: DSK (H3a) and ESE (H3b) are positively related to YEE, and DSK is positively related to ESE (H3c).

H4: DSK and ESE mediate the DEE–YEE relationship, singly and in sequence (DEE → DSK → ESE → YEE).

H5: YEE differs significantly across low, moderate, and high levels of DEE exposure.

Table 1. Selected Recent Studies Informing the Conceptual Model.

Study	Focus	Relevance to present study
Secundo et al. (2021)	Digital redesign of entrepreneurship education (COVID-19)	Shows feasibility of digital delivery
Wardana et al. (2020)	Education, attitude, self-efficacy, mindset	Supports ESE as mechanism
Cui et al. (2021)	Education and entrepreneurial mindset	Links education to mindset outcomes
Iwu et al. (2021)	Curriculum and lecturer competence; intention	Curriculum quality matters
Cueto et al. (2022)	Young entrepreneurs, digital innovation, MSMEs	Digital venturing sustains livelihoods
Kraus et al. (2022)	Digital transformation research overview	Digital skills as core requirement

3. METHODOLOGY

3.1 Design, participants, and data

A quantitative, cross-sectional survey design was adopted, consistent with explanatory research that tests theoretically specified relationships (Creswell & Creswell, 2023). The target population was tertiary students in North-East Nigeria enrolled in computer science/ICT, business/economics, and education programmes. The analyzed sample comprised 320 students (172 male, 53.8%; 148 female, 46.3%). Data reported in this version are simulated for illustrative purposes (see Data Transparency Statement) and must be replaced with collected survey data before submission.

Table 2. Sample Characteristics. (N = 320)

Characteristic	Category	n	%
Gender	Male	172	53.8
	Female	148	46.3
Programme	Education	138	43.1
	Business/Economics	93	29.1
	Computer Science/ICT	89	27.8

3.2 Measures and Analysis

All constructs were measured on five-point Likert scales (1 = strongly disagree, 5 = strongly agree): DEE (6 items; $\alpha = .86$), DSK (5 items; $\alpha = .83$), ESE (5 items; $\alpha = .79$), and YEE (6 items covering income generation, savings, financial decision-making, market access, and perceived economic security; $\alpha = .85$). All values exceed the .70 benchmark for acceptable reliability (Hair et al., 2022). Composite scores were computed as item means. Analyses included Pearson correlations, standardized multiple regression, a serial mediation model estimated with 5,000 bootstrap resamples and percentile 95% confidence intervals (Hayes, 2022), one-way ANOVA across DEE exposure terciles, and Welch's t test for gender comparison. Structural models of this kind may be re-estimated with covariance-based or variance-based SEM when the full dataset is available (Hair et al., 2022; Kline, 2023).

4. RESULTS AND DISCUSSION

4.1 Descriptive statistics and correlations

Mean scores were moderately high across constructs (Table 3). All correlations were positive and statistically significant (all $p < .001$), with the strongest association between ESE and YEE ($r = .57$) and a strong link between DEE and DSK ($r = .52$). Figure 1 summarizes the tested model with its standardized path estimates.

Table 3. Means, Standard Deviations, Reliabilities, and Correlations.

Variable	M	SD	α	1	2	3	4
1. DEE	3.46	0.66	.86	—			
2. DSK	3.49	0.66	.83	.52	—		
3. ESE	3.53	0.62	.79	.36	.41	—	
4. YEE	3.33	0.66	.85	.46	.39	.57	—

Note. N = 320. DEE = digital entrepreneurship education; DSK = digital skills; ESE = entrepreneurial self-efficacy; YEE = youth economic empowerment. All correlations significant at $p < .001$.

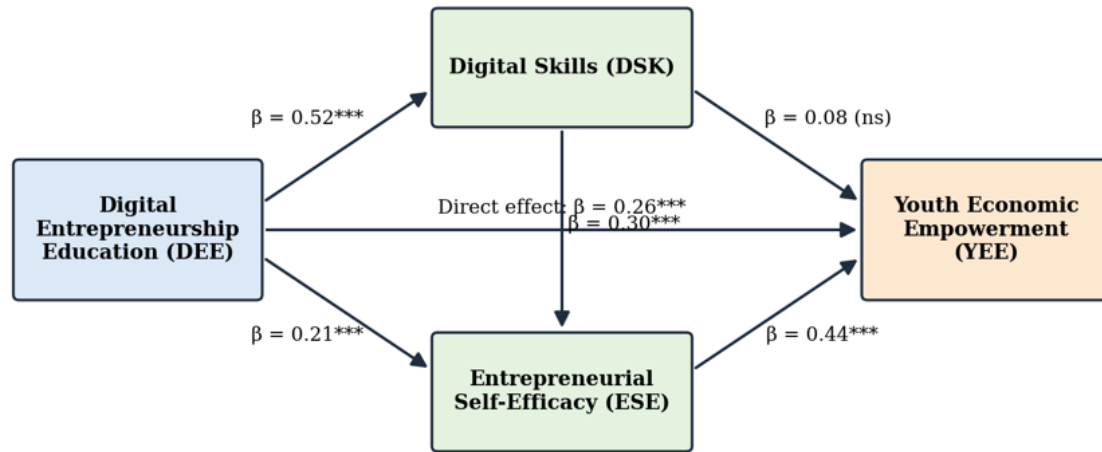


Figure 1. Serial Mediation Model with Standardized Path Coefficients.

Note. $p < .001$; *ns* = not significant. Arrow between DEE and YEE shows the direct effect controlling for mediators.

4.2 Regression and mediation analysis

DEE significantly predicted YEE when entered alone ($\beta = .46$, $p < .001$; $R^2 = .21$), supporting H1. DEE strongly predicted DSK ($\beta = .52$, $p < .001$) and ESE ($\beta = .21$, $p < .001$), supporting H2a and H2b, and DSK predicted ESE ($\beta = .30$, $p < .001$), supporting H3c. In the full model (Table 4), DEE ($\beta = .26$) and ESE ($\beta = .44$) remained significant predictors of YEE, whereas DSK did not ($\beta = .08$, $p = .134$). H3b was therefore supported but H3a was not, and the model explained 40% of the variance in YEE.

Table 4. Standardized Regression of Youth Economic Empowerment on Predictors.

Predictor	β	SE	T	P
DEE	.26	.05	5.06	< .001
DSK	.08	.05	1.50	.134
ESE	.44	.05	9.07	< .001

Note. $R^2 = .40$. $p < .001$.

Bootstrapped indirect effects are shown in Table 5. The specific indirect effect through ESE ($\beta = .09$) and the serial path through DSK and then ESE ($\beta = .07$) were significant because their confidence intervals excluded zero. The path through DSK alone was not. The total indirect effect ($\beta = .20$) accounted for about 43% of the total effect, indicating partial mediation and partially supporting H4. Digital skills therefore appear to matter mainly because they build confidence, not because they translate directly into empowerment.

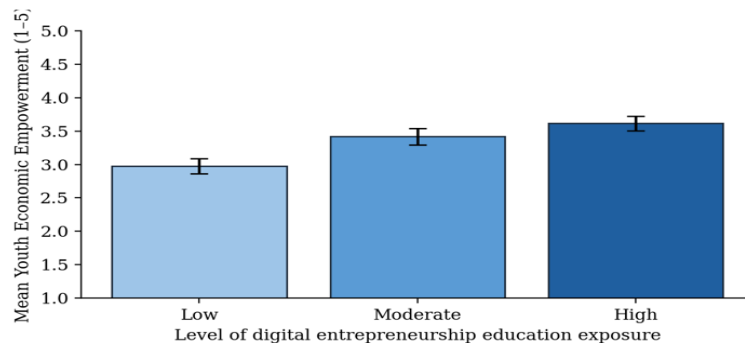
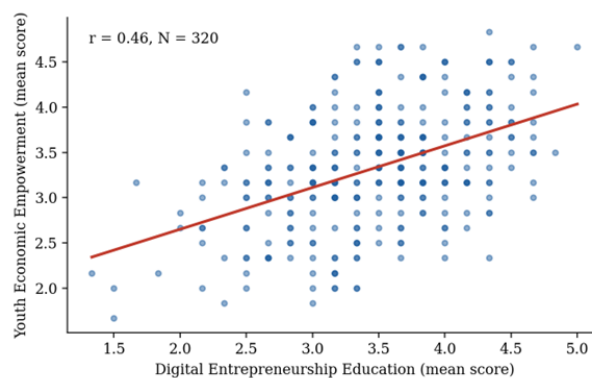
Table 5. Bootstrapped Indirect Effects of DEE on YEE. (5,000 Resamples)

Pathway	Effect	95% CI lower	95% CI upper	Significant
DEE → DSK → YEE	.04	-.01	.10	No
DEE → ESE → YEE	.09	.04	.14	Yes
DEE → DSK → ESE → YEE	.07	.04	.10	Yes
Total indirect	.20	.13	.27	Yes

Note. CI = bias-uncorrected percentile confidence interval. Effects are standardized.

4.3 Group differences

One-way ANOVA across DEE exposure terciles showed a significant and large difference in YEE, $F(2, 317) = 33.08$, $p < .001$, $\eta^2 = .17$, supporting H5. Mean empowerment rose from 2.98 ($SD = 0.61$, $n = 115$) in the low group to 3.42 ($SD = 0.61$, $n = 98$) in the moderate group and 3.62 ($SD = 0.57$, $n = 107$) in the high group (Figure 2). The scatterplot in Figure 3 shows the same positive linear pattern at the individual level. Empowerment did not differ significantly by programme, $F(2, 317) = 1.33$, $p = .265$, which suggests that DEE benefits are not confined to computer science students. Women reported slightly higher empowerment than men ($M = 3.40$ vs. 3.26), a difference at the margin of significance, Welch $t = -1.96$, $p = .051$.


Figure 2. Mean Youth Economic Empowerment by Level of DEE Exposure.

Figure 3. Relationship Between DEE and YEE Composite Scores.

4.4 DISCUSSION

The results show that digital entrepreneurship education is associated with higher youth economic empowerment, and that much of this association runs through psychological and capability channels. Consistent with earlier work on entrepreneurship education and mindset (Cui et al., 2021; Wardana et al., 2020), self-efficacy emerged as the strongest correlate of empowerment. The finding that digital skills influenced empowerment only through self-efficacy is the most instructive result. It implies that technical competence alone is insufficient: students must also come to believe they can apply that competence to create value. This is consistent with experiential accounts, in which learning by doing generates the confidence that classroom knowledge alone does not (Lackéus, 2020; Mukesh et al., 2020).

The absence of programme differences is practically important. Business, education, and computer science students all benefited at similar levels, which supports embedding digital entrepreneurship modules across faculties instead of confining them to technology departments, an argument aligned with calls for broader, theory-informed delivery (Bell & Bell, 2020; Ratten & Jones, 2021). The marginal gender difference warrants follow-up with real data, since digital entrepreneurship may offer women flexible, lower-barrier entry routes.

5. CONCLUSION

Digital entrepreneurship education is positively and substantially related to youth economic empowerment, mainly because it builds entrepreneurial self-efficacy and, through digital skills, strengthens that self-efficacy. Education systems that wish to convert growing digital connectivity into economic opportunity for young Nigerians should therefore design programmes that combine digital competence with confidence-building, practice-based venture creation.

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