HARNESSING DIGITAL TOOLS AND ADDRESSING CURRICULUM GAPS FOR TRAINING SELFRELIANT BUSINESS EDUCATION UNDERGRADUATES

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Abstract
This study examined the influence of instructional and entrepreneurial digital tools, as well as curriculum adjustments and adaptations, on curriculum gaps and the self-reliance motivation of Business Education undergraduates in Cross River State, Nigeria. Specifically, it determined how instructional digital tools and content-related curriculum adjustments influence curriculum gaps and whether these gaps mediate their effect on self-reliance; and how entrepreneurial digital tools and pedagogical adaptations influence curriculum gaps and, through them, self-reliant motivation. The study adopted a descriptive survey research design with a population of 424 final-year undergraduates across five public institutions. Using Krejcie and Morgan's (1970) table, a sample of 201 respondents was selected. Data were collected with a validated and reliable instrument titled Digital Tools, Curriculum Gaps, and Self-Reliance Questionnaire (DTCGSRQ) (α = .83), and analyzed using descriptive statistics and multiple regression, with all hypotheses tested at the 0.05 level of significance. Findings showed that instructional digital tools significantly reduced curriculum gaps (η^2 = .096) and enhanced self-reliance (η^2 = .222), whereas content-related curriculum adjustments had no significant effect. Entrepreneurial digital tools strongly reduced curriculum gaps (η^2 = .488) and directly enhanced self-reliant motivation (η^2 = .164). Pedagogical curriculum adaptations also reduced gaps (η^2 = .392) but had no direct impact on self-reliance, instead influencing it indirectly through gap reduction. Thus, the two null hypotheses were rejected. The study concludes that digital transformation, particularly through instructional and entrepreneurial digital tools, is pivotal to bridging curriculum gaps and fostering self-reliance, while curriculum adjustments alone remain insufficient. It recommends prioritizing digital tools and entrepreneurial platforms, supported by innovative pedagogies, as the most effective strategy for preparing graduates with autonomy, problem-solving capacity, and entrepreneurial readiness. Implications emphasize the need for faculty training, curriculum redesign, and stronger industry–university collaboration to ensure globally competitive, self-reliant graduates.

Keywords: *Business Education, Digital Tools, Curriculum Gaps, Self-reliance motive, Entrepreneurship Education, Instructional Innovation*

Introduction

Business education is designed to prepare undergraduates with the knowledge, skills, and motivation to become self-reliant and innovative contributors to the economy. Ideally, the programme should provide a curriculum that is relevant, dynamic, and digitally driven, exposing students to practical tools that reflect modern business realities. Such a system would instill in undergraduates the capacity to initiate enterprises, manage resources effectively, and pursue careers beyond scarce wage employment opportunities. However, in many Nigerian universities, a wide gap persists. Much of the curriculum remains rigid and outdated, while digital tools that could strengthen teaching and entrepreneurial engagement are underutilized or absent. This weakens the ability of business education to inspire undergraduates to embrace self-reliance as a viable career path. Against this backdrop, this study examines how harnessing digital tools and addressing curriculum gaps can enhance the self-reliance motive among business education undergraduates.

The rapid digital transformation of higher education has made instructional and entrepreneurial technologies central to preparing graduates for contemporary workplaces. Digital learning environments, artificial intelligence (AI), and other emerging instructional technologies have expanded opportunities for active learning, collaboration, reflective practice, and independent knowledge construction. Empirical evidence indicates that AI-supported instructional practices improve instructional planning, learner engagement, reflective thinking, and pedagogical effectiveness when supported by appropriate training and institutional readiness (Meishar-Tal et al., 2026; Tran et al., 2026; Appleget & Yang, 2026). Similarly, institutional preparedness, lecturers' digital competence, and supportive learning environments significantly influence the effectiveness of digital instructional delivery in higher education (Johnson et al., 2026). Within business education, AI-supported training has been shown to improve graduates' competencies for the future of work by strengthening digital, analytical, and professional skills required in emerging labour markets (Okon et al., 2025). These findings suggest that purposeful integration of digital instructional tools can strengthen learners' capacity for independent learning, innovation, and lifelong skill development.

While digital technologies create new learning opportunities, their educational value depends largely on curriculum responsiveness. Business education curricula must continually evolve to reflect technological advancement, changing labour market expectations, and emerging entrepreneurial opportunities. Evidence from Nigeria demonstrates that effective institution-industry collaboration significantly promotes curriculum innovation by incorporating industry expertise, contemporary business practices, and twenty-first-century competencies into business education programmes (Okon & Ewuru, 2024). Likewise, longitudinal evidence shows that entrepreneurship education produces more sustainable learning outcomes when embedded across academic programmes rather than offered as isolated instructional activities, thereby promoting coherent competence development and entrepreneurial thinking throughout students' learning experiences (Klofsten, 2026). Broader evidence further indicates that graduate employability is shaped not only by individual attributes but also by curriculum quality, educational arrangements, institutional support, and learning environments that collectively prepare students for successful career transitions (Monteiro et al., 2025). Consequently, curriculum responsiveness remains an indispensable requirement for producing graduates capable of adapting to rapidly changing business environments.

Entrepreneurial digital tools further complement instructional technologies by providing authentic learning experiences that strengthen entrepreneurial competence and self-reliance. Digital business applications, AI-supported entrepreneurial activities, and experiential learning environments expose students to realistic business challenges while encouraging independent problem-solving and innovation. Evidence from entrepreneurship internship programmes demonstrates that self-directed experiential learning strengthens entrepreneurial competence through reflective practice, authentic workplace experiences, and continuous experimentation (Rybakovas et al., 2026). Similarly, high-quality work-integrated learning enhances students' career self-efficacy and career adaptability, which subsequently improve employability and workplace readiness (Xue & Ooi, 2026). Nigerian evidence equally indicates that students who possess stronger confidence in their abilities and attach greater value to workplace learning demonstrate significantly higher persistence during work-placement activities, thereby improving

learning outcomes and professional preparedness (Ogbaekirigwe et al., 2025). These findings collectively suggest that entrepreneurial digital tools become most effective when integrated with experiential learning opportunities that encourage initiative, creativity, and independent decision-making.

Notwithstanding these opportunities, several pedagogical and institutional challenges continue to limit the transformative potential of digital technologies in business education. Studies reveal that educators generally demonstrate positive attitudes towards AI and digital technologies but often lack the institutional support, technological infrastructure, and professional preparation required for effective classroom integration (Johnson et al., 2026; Meishar-Tal et al., 2026). Furthermore, training programmes that combine technological competence with reflective and pedagogical reasoning consistently produce better instructional outcomes than technology-focused training alone (Tran et al., 2026). Collaborative learning, continuous feedback, and reflective engagement with AI tools also enhance learners' critical thinking and instructional quality (Appleget & Yang, 2026). Conversely, inadequate professional development, limited content knowledge, insufficient training duration, and weak institutional support continue to undermine effective curriculum implementation and digital technology integration (Sepadi & Themane, 2026). These challenges indicate that meaningful digital transformation requires simultaneous investment in infrastructure, curriculum reform, lecturer capacity development, and learner-centred pedagogical practices.

Self-reliance remains one of the primary goals of business education because it equips graduates with the confidence and competence to create employment opportunities rather than depend solely on wage employment. Recent evidence demonstrates that AI-supported business education training significantly enhances graduates' readiness for the future of work by improving practical competencies relevant to contemporary labour markets (Okon et al., 2025). Similarly, entrepreneurship education, quality work-integrated learning, and institution-industry collaboration collectively strengthen graduates' employability, adaptability, entrepreneurial competence, and innovation capacity (Klofsten, 2026; Xue & Ooi, 2026; Okon & Ewuru, 2024). These educational experiences cultivate self-confidence, opportunity recognition, problem-solving ability, and independent career orientation, all of which are fundamental characteristics of self-reliant graduates.

The reviewed literature consistently demonstrates that digital instructional technologies, entrepreneurial learning experiences, curriculum innovation, and industry collaboration positively contribute to graduate competence development and employability. Nevertheless, existing studies have largely examined these variables independently, with limited attention devoted to understanding their combined influence on the self-reliance motive of business education undergraduates within Nigerian universities. In particular, empirical evidence remains limited regarding how instructional digital tools, entrepreneurial digital tools, and curriculum responsiveness interact to shape students' motivation for self-reliance. Addressing this gap is important because these educational components are complementary rather than independent determinants of graduate development. This study therefore investigates the influence of instructional digital tools, entrepreneurial digital tools, and curriculum gaps on the self-reliance motive among business education undergraduates in Nigerian universities.

Statement of the problem

The goal of business education is to produce graduates with strong self-reliance, yet this remains unmet. Despite digital adoption, outdated curricula and weak pedagogy limit alignment with entrepreneurial realities, leaving many graduates unmotivated for self-directed ventures. Unemployment persists due to poor use of instructional and entrepreneurial digital tools, alongside inadequate curriculum adjustments. This study examined how digital tools and curriculum adaptations influence curriculum gaps and self-reliance motivation.

Research questions

1. How do instructional digital tools and content-related curriculum adjustments influence curriculum gaps, and to what extent do these gaps mediate their effect on the self-reliance motivation of business education undergraduates?

2. How do entrepreneurial digital tools and pedagogical curriculum adaptations influence curriculum gaps, and to what extent do these gaps mediate their effect on the self-reliance motivation of business education undergraduates?

Null hypotheses

1. Instructional digital tools and content-related curriculum adjustments do not significantly influence curriculum gaps, nor do these gaps significantly mediate their effect on the self-reliance motivation of business education undergraduates.
2. Entrepreneurial digital tools and pedagogical curriculum adaptations do not significantly influence curriculum gaps, nor do these gaps significantly mediate their effect on the self-reliance motivation of business education undergraduates.

Method

This study adopted a descriptive survey to investigate the influence of instructional digital tools, entrepreneurial digital tools, and curriculum gaps on the self-reliance motivation of Business Education undergraduates in Cross River State, Nigeria. The population was 424 final-year students from five public institutions, with a sample of 201 determined using Krejcie and Morgan's (1970) Table. Data were collected using the *Digital Tools, Curriculum Gaps, and Self-Reliance Questionnaire (DTCGSRQ)*, covering instructional tools (Zoom, Moodle), entrepreneurial tools (QuickBooks, Shopify), curriculum gaps, and self-reliance outcomes (venture creation, independent work, competitiveness). Responses were on a four-point scale. The instrument was validated by experts, pilot-tested with 30 students, and yielded Cronbach's Alpha of .83. Data were analyzed with descriptive statistics and multiple regression. R^2, β, and F-ratio tested model significance at the 0.05 level, providing insights into how digital tools and curriculum gaps shape undergraduates' self-reliance motivation.

Results

Research question one

How do instructional digital tools and content-related curriculum adjustments influence curriculum gaps, and to what extent do these gaps mediate their effect on the self-reliance motivation of business education undergraduates?

Table 1: Effects of instructional digital tools (items 1–6) and content-related curriculum adjustments (items 7–12) on curriculum gaps (items 25–29) and self-reliance motivation (items 30–35)

Predictor (questionnaire section & items)	Outcome (section & items)	F	P	Partial η^2	% variance (approx.)	Direction / Interpretation
Instructional digital tools (B: 1–6)	Curriculum gaps (F: 25–29)	21.081	<.001	.096	9.6%	Narrowed curriculum gaps
Instructional digital tools (B: 1–6)	Self-reliance (G: 30–35)	56.440	<.001	.222	22.2%	Increased self-reliance
Content adjustments (C: 7–12)	Curriculum gaps (F: 25–29)	2.195	.140	.011	1.1%	No significant effect
Content adjustments (C: 7–12)	Self-reliance (G: 30–35)	0.548	.460	.003	0.3%	No significant effect

Scores for instructional digital tools were computed from Section B (items 1–6: Zoom, Moodle, Google Classroom, interactive whiteboard, computer-based simulation, virtual lab). Scores for content-related curriculum adjustments were computed from Section C (items 7–12: e-commerce, data analytics, digital marketing, digital case studies, real-world scenarios, curriculum revisions). Curriculum gaps were measured by Section F (items 25–29) and self-reliance motivation by Section G (items 30–35). The analysis showed that instructional digital tools significantly narrowed curriculum gaps ($F(1,198) = 21.081$, $p < .001$, Partial $\eta^2 = .096$) and also substantially increased self-reliance motivation ($F(1,198) = 56.440$, $p < .001$, Partial $\eta^2 = .222$). Content-related curriculum adjustments produced no significant change in curriculum gaps ($F(1,198) = 2.195$, $p = .140$, Partial $\eta^2 = .011$) and no meaningful effect on self-reliance motivation

(F(1,198) = 0.548, p = .460, Partial η^2 = .003). Taken together, these results indicate that instructional digital tools (Section B items 1–6) were the principal driver in reducing curriculum deficiencies (Section F items 25–29) and in promoting self-reliant motivation (Section G items 30–35), whereas content updates alone (Section C items 7–12) showed negligible influence. The pattern suggests a plausible pathway whereby reductions in curriculum gaps associated with instructional digital tools contribute to higher self-reliance motivation.

Research question two

How do entrepreneurial digital tools and pedagogical curriculum adaptations influence curriculum gaps, and to what extent do these gaps mediate their effect on the self-reliance motivation of business education undergraduates?

The data were generated from the Digital Tools, Curriculum Gaps, and Self-Reliance Questionnaire (DTCGSRQ). Entrepreneurial digital tools (Section D: items 13–18) and pedagogical curriculum adaptations (Section E: items 19–24) were assessed in relation to their effects on curriculum gaps (Section F: items 25–29) and self-reliant motive (Section G: items 30–35).

Table 2: Effects of entrepreneurial digital tools and pedagogical curriculum adaptation on curriculum gaps and self-reliant motive of business education undergraduates

Independent Variable	Dependent Variable	F-value	p-value	Partial η^2	Interpretation
Entrepreneurial Digital Tools	Curriculum Gaps	188.64	<.001	.488	Significantly reduced curriculum gaps with a very strong effect
Pedagogical Curriculum Adaptations	Curriculum Gaps	127.52	<.001	.392	Significantly reduced curriculum gaps with a substantial effect
Entrepreneurial Digital Tools	Self-Reliant Motive	38.71	<.001	.164	Significantly and directly strengthened self-reliant motive
Pedagogical Curriculum Adaptations	Self-Reliant Motive	0.24	.623	.001	Did not significantly predict self-reliant motive independently

R^2 = .682 (Entrepreneurial Digital Tools + Pedagogical Curriculum Adaptations jointly explained 68.2% of variance in curriculum gaps).

The results show that both entrepreneurial digital tools and pedagogical curriculum adaptations significantly influenced curriculum gaps and, through that pathway, the self-reliant motive of business education undergraduates. Specifically, entrepreneurial digital tools had a very strong effect on reducing curriculum gaps (F = 188.64, p < .001, η^2 = .488), while pedagogical curriculum adaptations also contributed substantially to reducing these gaps (F = 127.52, p < .001, η^2 = .392). Together, the two factors explained about 68% of the variance in curriculum gaps (R^2 = .682).

Curriculum gaps reduction indicates that the application of entrepreneurial digital tools (such as digital accounting platforms, e-commerce simulations, and productivity software) and curriculum adaptations (such as practice-based, competency-driven learning designs) effectively close the disconnect between theory and workplace realities. This reduction in gaps consequently strengthens the conditions necessary for undergraduates to develop stronger self-reliant motivation. On direct influence, entrepreneurial digital tools significantly predicted the self-reliant motive (F = 38.71, p < .001, η^2 = .164), while pedagogical curriculum adaptations did not significantly predict self-reliant motive when acting alone (F = 0.24, p = .623, η^2 = .001). This indicates that entrepreneurial digital tools directly foster self-reliant motives by equipping undergraduates with functional, hands-on skills. Pedagogical adaptations, however, primarily influence self-reliance indirectly by minimizing curriculum gaps rather than directly stimulating the motive. In essence, entrepreneurial digital tools both reduce curriculum gaps and directly strengthen

self-reliance, whereas pedagogical curriculum adaptations work more as a corrective measure that bridges gaps, indirectly promoting self-reliant motivation. The combined outcome is that, as gaps are reduced, undergraduates' self-reliance motives improve, ensuring they are better prepared for entrepreneurial and career independence.

Null hypothesis one

Instructional digital tools and content-related curriculum adjustments do not significantly influence curriculum gaps, nor do these gaps significantly mediate their effect on the self-reliance motivation of business education undergraduates.

The results from the multivariate tests and the tests of between-subjects effects are summarised in Table 2.

Source	Dependent Variable	F	Sig.	Partial Eta Squared	Decision (α = .05)
Instructional Digital Tools	Self-reliant Motivation	56.44	.000	.222	Reject H_0 (Significant)
Instructional Digital Tools	Curriculum Gaps	21.08	.000	.096	Reject H_0 (Significant)
Content-related Curriculum Adjustment	Self-reliant Motivation	0.55	.460	.003	Fail to Reject H_0 (Not Significant)
Content-related Curriculum Adjustment	Curriculum Gaps	2.20	.140	.011	Fail to Reject H_0 (Not Significant)
Corrected Model	Self-reliant Motivation	30.35	.000	.235	Significant overall
Corrected Model	Curriculum Gaps	16.09	.000	.140	Significant overall

The multivariate tests showed that instructional digital tools had a significant multivariate effect on the combined dependent variables (self-reliance motivation and curriculum gaps) with Wilks' Lambda = .754, $F(2,197) = 32.172$, $p < .001$, partial $\eta^2 = .246$, indicating a strong effect. Content-related curriculum adjustment, however, did not have a significant multivariate effect, Wilks' Lambda = .983, $F(2,197) = 1.727$, $p = .181$, partial $\eta^2 = .017$. From the between-subjects effects, instructional digital tools significantly predicted self-reliance motivation ($F = 56.440$, $p < .001$, $\eta^2 = .222$) and curriculum gaps ($F = 21.081$, $p < .001$, $\eta^2 = .096$). In contrast, content-related curriculum adjustment was not significant for either self-reliance motivation ($F = 0.548$, $p = .460$) or curriculum gaps ($F = 2.195$, $p = .140$).

Since instructional digital tools significantly influenced curriculum gaps and self-reliance motivation, and curriculum gaps also showed a significant relationship with self-reliance motivation, the overall null hypothesis was rejected. However, the contribution of content-related curriculum adjustment was not significant on its own. This further implies that nstructional digital tools significantly reduced curriculum gaps and, through this pathway, enhanced the self-reliance motivation of business education undergraduates, while content-related curriculum adjustment did not exert a meaningful independent effect.

Null hypothesis two

Entrepreneurial digital tools and pedagogical curriculum adaptations do not significantly influence curriculum gaps, nor do these gaps significantly mediate their effect on the self-reliance motivation of business education undergraduates.

Table 4: Multivariate and Between-Subjects Tests on the Influence of Entrepreneurial Digital Tools and Pedagogical Curriculum Adaptations on Curriculum Gaps and Self-Reliance Motive of Business Education Undergraduates (Questionnaire Sections B–D)

Source	Dependent Variable	F	Sig.	Partial Eta Squared	Interpretation
Entrepreneurial Digital Tools	Curriculum Gaps	188.643	.000	.488	Strong reduction in curriculum gaps; items included access to digital platforms and use of ICT-driven business simulations.
Entrepreneurial Digital Tools	Self-reliant Motive	38.712	.000	.164	Positive influence on self-reliance motive; items included use of digital entrepreneurship resources and e-commerce skills.
Pedagogical Curriculum Adaptation	Curriculum Gaps	127.521	.000	.392	Significant reduction of curriculum gaps; items included flexible content delivery and competency-based modules.
Pedagogical Curriculum Adaptation	Self-reliant Motive	.242	.623	.001	No significant direct effect; influence operates through reduction of curriculum gaps.

The null hypothesis stated that entrepreneurial digital tools and pedagogical curriculum adaptations do not significantly influence curriculum gaps, nor do these gaps significantly mediate their effect on the self-reliance motivation of business education undergraduates. The multivariate test results in Table 1 indicate otherwise. For entrepreneurial digital tools, the Wilks' Lambda value (.495) with an F ratio of 100.684 at 2 and 197 degrees of freedom was significant at .000, with a partial eta squared of .505. This shows that items in the questionnaire which measured entrepreneurial digital tools (such as students' access to digital business platforms, use of e-commerce applications, and integration of ICT-driven business simulations) significantly explained variations in both curriculum gaps and self-reliance motive. Similarly, pedagogical curriculum adaptation had a Wilks' Lambda of .595, F ratio of 66.960 at 2 and 197 degrees of freedom, significant at .000, with a partial eta squared of .405. This implies that questionnaire items measuring curriculum adaptations (such as lecturers' incorporation of flexible content, use of competency-based modules, and contextual teaching approaches) also significantly contributed to reducing curriculum gaps and enhancing self-reliance motive.

The between-subjects effects further clarified these outcomes. Entrepreneurial digital tools had a significant effect on curriculum gaps ($F = 188.643$, $p = .000$, partial eta squared = .488) and on self-reliance motive ($F = 38.712$, $p = .000$, partial eta squared = .164). Pedagogical curriculum adaptations significantly reduced curriculum gaps ($F = 127.521$, $p = .000$, partial eta squared = .392), but their direct effect on self-reliance motive was not significant ($F = .242$, $p = .623$, partial eta squared = .001). This suggests that curriculum adaptations primarily operate through their capacity to minimize curriculum gaps, and that this reduction subsequently supports the development of self-reliant motivation among undergraduates. Therefore, entrepreneurial digital tools and pedagogical curriculum adaptations significantly influence curriculum gaps, and through these, they also influence the self-reliance motivation of business education undergraduates.

Discussion of findings

The digital transformation in business education highlights instructional and entrepreneurial digital tools as pivotal to cultivating self-reliant undergraduates. Evidence shows that simulations, virtual labs, AI-supported platforms, and LMS enhance engagement, conceptual clarity, and autonomy (Lim et al., 2019; Alghamdi, 2022). In resource-constrained Nigerian institutions, tools like Moodle, Zoom, and interactive

whiteboards expand access and collaboration, while AI-based systems strengthen independent learning (Okon et al., 2024). However, findings revealed that content-related curriculum adjustments neither reduced curriculum gaps nor improved self-reliant motives—contrary to expectations that digital and market-oriented modules should enhance adaptability (Ntekim-Rex & Oni, 2023; Tynjälä et al., 2022). This suggests that without deeper pedagogical reform, curriculum changes alone may not drive autonomy.

Entrepreneurial digital tools—such as business simulations, AI ideation platforms, and financial applications—strongly reduced curriculum gaps and enhanced self-reliant motives by replicating real business processes and fostering venture readiness (Ali & Ahmad, 2021; Arasti et al., 2022; Boni et al., 2023). In contrast, pedagogical adaptations reduced curriculum gaps but showed no direct effect on self-reliance, indicating their influence depends on synergy with entrepreneurial tools (Ndofirepi & Rambe, 2022; Kolb & Kolb, 2023). The combined effects of digital tools and curriculum adjustments were significant but uneven: instructional tools most reduced gaps and promoted autonomy, entrepreneurial tools directly enhanced self-reliance, and pedagogy played a supporting role. Overall, results underscore that effective deployment of digital tools is more decisive than curriculum reform alone in fostering autonomy, especially in resource-limited contexts where digital adoption offers a quicker path to employability (Daniel et al., 2023; Peterson & Duffy, 2021; González-Pérez et al., 2023).

Conclusion

The study shows that digital transformation through instructional and entrepreneurial tools reduces curriculum gaps and fosters self-reliance among business education undergraduates. Instructional tools enhanced engagement, bridged theory-practice gaps, and strengthened autonomy, while curriculum adjustments alone had little effect. Entrepreneurial tools directly boosted self-reliance, with pedagogical adaptations helping mainly through gap reduction. Findings suggest that integrating digital and entrepreneurial tools with supportive pedagogy is vital for producing innovative, independent graduates. In resource-limited settings, prioritizing digital adoption and experiential strategies offers a stronger pathway than curriculum updates alone. Digital innovations, more than content reform, drive self-reliance and employability in business education.

Recommendations

1. Universities should deploy instructional digital tools—such as simulations, virtual labs, AI platforms, and LMS—since these reduce curriculum gaps and foster self-reliance. Content adjustments alone are ineffective but become impactful when combined with digital tools.
2. Institutions should integrate entrepreneurial digital tools—like business simulations, AI ideation systems, and productivity apps—supported by pedagogical strategies such as problem-based learning, flipped classrooms, and experiential projects. These tools directly enhance self-reliance, while pedagogy strengthens outcomes by closing curriculum gaps.

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