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Impact of Public-Private Partnership Models on Entrepreneurial Skills Acquisition among Technical and Vocational Education and Training Students in South-South, Nigeria

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Abstract

Persistent graduate unemployment and skill mismatches remain critical challenges in Nigeria despite substantial investment in Technical and Vocational Education and Training (TVET). In response, Public-Private Partnership (PPP) models have been promoted as mechanisms for bridging gaps between education and industry. However, empirical evidence on their effectiveness remains limited, particularly in South-South Nigeria, a region central to the nation's economy but plagued by unemployment and underemployment. This study was motivated by the need to evaluate whether PPP frameworks enhance employability and entrepreneurial outcomes while integrating innovation as a potential mediating factor. A descriptive survey design with correlational analysis was employed, drawing on 421 respondents (338 TVET graduates and 83 private-sector partners) sampled from a population of 1,372 using multi-stage sampling techniques. Data were collected through validated and pilot-tested scales measuring employability, entrepreneurial success, PPP models, and innovative capability. Findings revealed that PPP models significantly enhanced entrepreneurial success through incubation hubs, mentorship, and entrepreneurship initiatives, but exerted a negative influence on employability outcomes, indicating a misalignment with labor market needs. Innovative capability did not significantly mediate outcomes, highlighting gaps in embedding creativity and problem-solving within PPP interventions. The study concludes that PPP frameworks must prioritize innovation-oriented and holistic skills training to effectively address unemployment, foster entrepreneurship, and drive inclusive economic transformation in Nigeria.

Keywords: Employability Outcome, Entrepreneurial Success, Public-Private Partnership (PPP) Models, TVET Graduates.

Introduction

Technical and Vocational Education and Training (TVET) has gained growing global recognition as a powerful instrument for skills acquisition, workforce preparedness, and socio-economic advancement. Internationally, TVET has evolved from being perceived as an alternative or secondary educational route to becoming a strategic pillar for competitiveness and employment creation. Its significance rests on its capacity to provide learners with both technical expertise and entrepreneurial competencies, thereby enabling them to obtain meaningful employment or establish sustainable enterprises (Mabutha, 2024). As economies increasingly shift toward technology-driven sectors, the need for adaptable and multi-skilled workers has intensified, positioning TVET at the forefront of workforce development and innovation (Selane & Odeku, 2024). Notwithstanding its promise, TVET systems frequently encounter criticism regarding their limited alignment with labour market requirements. Although many graduates possess technical knowledge, they often lack broader competencies demanded by employers, such as business acumen, problem-solving ability, communication skills, and adaptability (Adewolu, 2024; Ujevbe et al., 2020; Malekshahian et al., 2025). Such shortcomings undermine employability, understood as the capacity to obtain, maintain, and effectively perform in employment, and constrain entrepreneurial performance (Ujevbe et al., 2020). In this study, TVET graduates refer to individuals who complete structured programmes in universities, polytechnics, or technical colleges. Employability outcomes denote their successful transition into meaningful employment, while entrepreneurial success involves the creation and sustainability of ventures that promote innovation and community development (Bhatti & Zakariya, 2024; Somewethee et al., 2023). Both outcomes are vital to fostering an inclusive and resilient Nigerian economy (Bank of Industry Limited, 2025). To address these concerns, enhanced collaboration among multiple stakeholders has been proposed as a viable solution. Governments, private sector organizations, and academic institutions are increasingly engaging in joint efforts to design training programmes that reflect market realities (Semali, 2024). Public-Private Partnerships (PPPs) are particularly important in



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this regard, as they combine resources, expertise, and networks to improve graduate outcomes. Within the TVET context, PPPs take the form of curriculum co-design, industry-sponsored training, apprenticeship schemes, incubation centres, and entrepreneurship initiatives. These collaborative efforts provide learners with exposure to contemporary technologies, internships, and industry networks, thereby strengthening employability and entrepreneurial preparedness (Niwamanya et al., 2025; Taofeek et al., 2025). Empirical evidence highlights the positive role of PPPs. Research conducted in India, Ghana, and Kenya indicates that PPP-driven training and incubation programmes yield superior employability and entrepreneurial outcomes compared to initiatives solely managed by government (Srivastava et al., 2025; Anand & Kumar, 2021). In Nigeria, PPP arrangements within the ICT and construction sectors have contributed to improved technical proficiency, entrepreneurial orientation, and employment placement rates (Niwamanya et al., 2025). South-South Nigeria, characterized by its economic significance in oil, gas, and manufacturing alongside persistent graduate unemployment, presents an important context for assessing PPP effectiveness. Despite existing opportunities, empirical evidence regarding the impact of PPPs on employability and entrepreneurship in this region remains scarce and fragmented. Contemporary scholarship expands the concept of employability beyond technical competence to include soft skills, entrepreneurial orientation, and adaptability (Adewolu, 2024; Gordon, 2024). Industry partnerships facilitate the integration of these dimensions, ensuring that graduate competencies align with labour market expectations while nurturing entrepreneurial ecosystems. In addition to addressing skills mismatches, PPPs provide platforms for fostering creativity, innovation, and entrepreneurial thinking. Central to this discussion is the notion of innovative capability, which has become increasingly pivotal to both employability and entrepreneurial success. While earlier research primarily emphasized technical proficiency, contemporary studies underscore the importance of generating, adapting, and applying new ideas in dynamic labour markets and entrepreneurial contexts (Bhatti & Zakariya, 2024; Li et al., 2022). Innovative capability empowers graduates to navigate change, develop creative solutions, and sustain ventures amidst uncertainty. According to Tikas (2023), it is a multidimensional construct encompassing creativity, adaptability, teamwork, and knowledge application, thereby serving as a crucial bridge between training inputs and performance outcomes. Public-Private Partnerships have the potential to strengthen innovation-oriented competencies by immersing learners in environments that encourage creativity, problem-solving, and adaptability (João & Silva, 2017). Industry-sponsored training exposes students to practical challenges, curriculum co-design enhances relevance, and incubation hubs cultivate entrepreneurial agility. Nonetheless, the effectiveness of PPPs is not automatic. Institutional weaknesses, resource constraints, and conflicting incentives may limit their impact (Somewethee et al., 2023). Consequently, the relationship between PPPs and graduate success is multifaceted, with innovative capability emerging as a possible mediating factor.

Statement of the Research Problem

Although TVET is widely acknowledged as a strategic pathway for workforce development and entrepreneurial growth, persistent concerns remain regarding the employability and entrepreneurial performance of its graduates, particularly in Nigeria. Despite receiving technical training, many graduates continue to face unemployment or underemployment, largely due to gaps in holistic competencies such as business literacy, adaptability, communication, and problem-solving skills. These deficiencies suggest a disconnect between training provision and labour market expectations. Public-Private Partnerships (PPPs) have been proposed as a mechanism for bridging this gap by aligning curricula with industry needs, providing industry-funded training, and supporting incubation and entrepreneurship initiatives. While evidence from other countries and selected sectors in Nigeria indicates positive outcomes associated with PPP-driven models, empirical findings specific to South-South Nigeria remain limited and fragmented. Given the region's economic relevance and persistent graduate unemployment, there is insufficient clarity regarding the extent to which PPP initiatives meaningfully influence employability and entrepreneurial success among TVET graduates. Furthermore, although recent literature emphasizes innovative capability as critical to graduate performance in dynamic labour markets, its mediating role in the relationship between PPP initiatives and employability or entrepreneurial outcomes has not been adequately examined within the Nigerian context. Without understanding this mechanism, efforts to strengthen PPP models may lack strategic focus. Therefore, the core problem of this study lies in the limited empirical evidence on how Public-Private Partnerships influence employability and entrepreneurial success among TVET graduates in South-South Nigeria, and whether innovative capability serves as a mediating pathway linking PPP initiatives to these critical outcomes.

Objectives of the Study

1. To investigate the influence of PPP Models on TVET graduate employability outcomes.



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2. To determine the influence of PPP Models on TVET graduate entrepreneurial success.
3. To check for any mediating effect of innovative capacity on the relationship between PPP Models and TVTE graduate employability.
4. To observe the mediating effect of innovative capacity on the relationship between PPP models and entrepreneurial success.

Research Questions

1. What is the influence of PPP Models on TVET graduate employability outcomes?
2. What is the influence of PPP Models on TVET graduate entrepreneurial success?
3. What is the mediating effect of innovative capacity on the relationship between PPP Models and TVTE graduate employability?
4. What is the mediating effect of innovative capacity on the relationship between PPP models and entrepreneurial success?

The study is underpinned by Human Capital Theory (Becker, 1993), which posits that investments in education and training enhance productivity, employability, and income potential. Within this framework, PPPs serve as mechanisms that expand human capital investments by combining public resources with private expertise. Incorporating innovative capability as a mediator enriches this theoretical perspective by illustrating how training inputs translate into employability and entrepreneurial success. Accordingly, this study examined the direct effects of PPP models on employability and entrepreneurial outcomes among TVET graduates in South-South Nigeria and tested the mediating influence of innovative capability.

Methodology

This study adopted a descriptive survey design with correlational analysis to examine the impact of Public-Private Partnership (PPP) models on the employability and entrepreneurial success of TVET graduates in South-South Nigeria. This design was considered appropriate as it enabled the collection of quantitative data and the exploration of relationships among the study variables. The population comprised 1,372 respondents, including 1,232 TVET graduates (2018–2023) from two publicly owned universities and technical colleges, and 147 private sector partners from industries and companies in Delta and Edo States. South-South Nigeria was purposively selected for its economic significance in oil, gas, manufacturing, and services, as well as the persistent challenge of unemployment and skills mismatch in the region. The inclusion of both graduates and industry actors allowed the study to capture perspectives from both the supply and demand sides of TVET. A sample size of 421 respondents (338 graduates and 83 industry partners) was determined using Yamane's (1967) formula at a 5% margin of error, ensuring representativeness. Sampling involved a proportionate stratified random technique to achieve balance between states and categories, purposive sampling for targeted participants, and accidental sampling for accessible respondents. This multi-stage approach provided robust data for assessing PPP effectiveness in enhancing TVET graduates' employability and entrepreneurial outcomes. In a bid to ensure the reliability and validity of the measurements, this study adopted and adapted scales that are widely used to measure related variables in reputable journals. Scales adapted were done to the degree to which they measured contextual concerns. The instruments were subjected to face validity by experts in TVET, education research, and industry collaboration. A pilot study was conducted using 20 TVET graduates outside the study sample to test the reliability of the questionnaire. Unless otherwise specified, all scale items were measured using the Likert 5-point scale approach, where 1 means "strongly disagree" and 5, "strongly agree." The variable was measured using the employability skill scale developed by Sharma and Bhattarai (2022), containing 30 items divided into six domains, namely, communication skills (16 items, e.g., "*Speaking skill: can organize ideas and communicate orally*", "*Reporting skill: can prepare documents such as letters and reports.*"), thinking skills (5 items, e.g., "*Creative Thinking: usually come up with creative & innovative ideas*"), interpersonal skills/teamwork (5 items, e.g., "*Work with diversity: can work well with colleagues from diverse backgrounds.*"), and technology and information technology skills (5 items, e.g., "*Email: can send, receive, and manage emails.*"), planning and resource management skills (4 items, e.g., "*Finance: can prepare plans and budgets, make forecasts, keep records, and manage efficiently to meet objectives.*"), and personal qualities (5 items, e.g., "*Honesty: demonstrate honesty.*"). Public-Private Partnership (PPP) models were measured using a 16-item questionnaire assessing curriculum co-design, industry-funded training, entrepreneurship schemes, and incubation hubs (e.g., collaboration with industries for funded training and curriculum review). Entrepreneurial success was measured with an adapted 9-item scale by Rahman et al. (2015), which demonstrated



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good reliability (Cronbach's $\alpha = 0.80$). Innovative capability was assessed using a 12-item scale adapted from existing literature (Tikas, 2023; Calik et al., 2017), covering idea generation, application, adaptation, organizational learning, collaboration, and experimentation. Questionnaires were administered physically to TVET graduates and private sector partners to enhance response rates. Demographic information was also collected. Data were analyzed using descriptive statistics (means, frequencies, percentages) and regression analysis. PROCESS Macro was used to test the mediating role of innovative capability.

Presentation of Results

Table 1: Demographic Characteristics of the 421 Respondents

Variable	Category	TVET Graduates (n = 338)	Companies/Industry Respondents (n = 83)	Total (N = 421)
Gender	Male	309 (91.4%)	74 (89.2%)	383 (91.0%)
	Female	29 (8.6%)	9 (10.8%)	38 (9.0%)
Type of Institution	University	118 (34.9%)	–	118 (28.0%)
	Technical College	220 (65.1%)	–	220 (52.3%)
	Industries/Companies	–	83 (100%)	83 (19.7%)
Employment/Busi-ness Status	Self-employed	158 (46.7%)	13 (15.7%)	171 (40.6%)
	Employed (Public)	95 (28.1%)	–	95 (22.6%)
	Employed (Private)	85 (25.1%)	70 (84.3%)	155 (36.8%)
State of Residence	Delta	230 (68.0%)	50 (60.2%)	280 (66.5%)
	Edo	108 (32.0%)	33 (39.8%)	141 (33.5%)

Source: Fieldwork carried out by the researchers (2025).

The data show that both TVET graduates and industry respondents are predominantly male (91%). Most graduates (65.1%) were trained in technical colleges, while all industry respondents represent companies. Employment patterns differ: 46.7% of graduates are self-employed, while 84.3% of companies employ workers privately, highlighting strong private-sector engagement. Only 28.1% of graduates work in public service. Residence is concentrated in Delta State (66.5%), with Edo State accounting for 33.5%. Overall, results emphasize the technical training's role in private employment and entrepreneurship.

Research Question 1

What is the influence of PPP Models on TVET graduate employability outcomes?

Table 2: Regression Coefficients of PPP Models Predicting TVET Graduate Employability Outcomes

Predictor	B	SE	β	T	p
Constant	1.937	.062	—	31.012	.000
PPP models	-.080	.039	-.101	-2.075	.039

Source: Fieldwork carried out by the researchers (2025).

Note: B = Unstandardized Regression Coefficient; $SE B$ = Standard Error of the Coefficient; β = Standardized Regression Coefficient; t = t -test Statistic; p = Significance Level; VIF = Variance Inflation Factor; Dependent Variable: TVET Employability Outcomes

PPP models significantly but negatively predicted employability outcomes ($\beta = -0.101$, $p = .039$). This indicates that greater reliance on PPP models is associated with a slight decline in employability outcomes. Although the effect size is small, the finding suggests that the inability of TVET graduates to meet industry expectations may be linked to the poor quality or ineffective implementation of PPP models to which they were exposed during training. Such deficiencies in the models may have limited their capacity to acquire the requisite competencies for securing employment after graduation.

Research Question 2

What is the influence of PPP Models on TVET graduate entrepreneurial success?



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Table 3: Regression Coefficients of PPP Models Predicting Entrepreneurial Success among TVET Graduates

Predictor	B	SE	β	T	p
Constant	1.501	.110	—	13.590	.000
PPP models	.168	.068	.120	2.469	.014

Source: Fieldwork carried out by the researchers (2025).

Note: *B* = Unstandardized Regression Coefficient; *SE B* = Standard Error of the Coefficient; β = Standardized Regression Coefficient; *t* = *t*-test Statistic; *p* = Significance Level; VIF = Variance Inflation Factor; Dependent Variable: Entrepreneurial Success

PPP models positively and significantly predicted entrepreneurial success ($\beta = .120$, $p = .014$). This indicates that TVET graduates exposed to PPP-based initiatives are more likely to report higher entrepreneurial success. Although the effect size is modest, the relationship aligns with theoretical expectations. Additionally, the relationship could suggest that other factors may be responsible for this prediction.

Based on the two SPSS Process Macro output tables below, develop their reporting tables and their corresponding interpretations in APA 7th edition.

Research Question 3

What is the mediating effect of innovative capacity on the relationship between PPP Models and TVTE graduate employability?

Table 4: Mediation Analyses Predicting TVET Graduate Employability Outcomes through Innovative Capability

Effect Type	B	SE	<i>t</i>	<i>p</i>	95% CI (LL, UL)
Total effect	-0.08	0.04	-2.07	.039	[-0.16, -0.00]
Direct effect	-0.06	0.05	-1.32	.187	[-0.15, 0.03]
Indirect effect	-0.02	0.03	—	—	[-0.07, 0.03]

Source: Fieldwork carried out by the researchers (2025).

Note: *B* = unstandardized regression coefficient; *SE* = standard error; *t* = *t*-test statistic; *p* = significance level; CI = confidence interval (95%, bootstrap 5000 samples); Mediator = Innovative Capability

Table 4 above reveals that PPP models had a significant total negative effect on employability outcomes among TVET graduates ($B = -0.08$, $p = .039$), indicating that PPP models were associated with slightly lower employability among the graduates. However, it was not significant once the mediator (innovative capability) was introduced into the path, showing that the indirect effect via the mediator was not significant ($B = -0.02$, CI [-0.07, 0.03]), suggesting no mediation (95% CI includes zero).

Research Question 4

What is the mediating effect of innovative capacity on the relationship between PPP models and entrepreneurial success?

Table 5: Mediation Analyses Predicting Entrepreneurial Success among TVET Graduates through Innovative Capability

Effect Type	B	SE	<i>t</i>	<i>p</i>	95% CI (LL, UL)
Total effect	0.17	0.07	2.47	.014	[0.03, 0.30]
Direct effect	0.09	0.08	1.05	.295	[-0.07, 0.25]
Indirect effect	0.08	0.04	—	—	[0.00, 0.17]

Source: Fieldwork carried out by the researchers (2025).

Note: *B* = unstandardized regression coefficient; *SE* = standard error; *t* = *t*-test statistic; *p* = significance level; CI = confidence interval (95%, bootstrap 5000 samples); Mediator = Innovative Capability

The PPP models, as depicted in Table 5 above, show a significant total positive effect on entrepreneurial success ($B = 0.17$, $p = .014$). That is to say, the PPP models positively influenced entrepreneurial success among TVET graduates in the study. However, the direct effect was not significant when innovative capability was added, and the indirect effect via innovative capability was significant ($B = 0.08$, CI [0.00, 0.17]), indicating partial mediation (95% CI did not include zero).

Discussion and Findings

Influence of PPP Models on TVET Graduate Employability Outcomes

The present study found that PPP models exerted a statistically significant but negative influence on TVET graduate employability outcomes. This suggests that while partnerships between public institutions and private industry are intended to bridge skill gaps, their current form may be inadequate or misaligned with labour market demands. Similar concerns



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have been raised in prior research, which highlights persistent employability deficits in Nigeria despite policy-level efforts to integrate TVET with industry (Agundu, 2020; Ujevbe et al., 2020; Hassan & Anees, 2024). One possible explanation is that many PPP initiatives remain poorly institutionalized or focus heavily on technical aspects without embedding soft skills, adaptability, and workplace readiness. Adewolu (2024) and Gordon (2024) argue that employability in the 21st century requires a balanced emphasis on technical, cognitive, and socio-emotional skills. Where PPP frameworks neglect this balance, graduates may emerge technically competent yet ill-prepared for the complex realities of modern workplaces. This aligns with the findings of Sharma and Bhattarai (2022), whose employability scale places communication, problem-solving, and teamwork at the core of employability alongside technical knowledge. Thus, while PPP models hold promise, their effectiveness for employability outcomes depends on structural quality, inclusiveness, and sustained alignment with labour market needs.

Influence of PPP Models on Entrepreneurial Success

In contrast, PPP models demonstrated a significant positive effect on entrepreneurial success. This outcome aligns with evidence that industry–education partnerships provide access to incubation hubs, mentorship, and market linkages, which directly support entrepreneurial ventures (Mabutha, 2024; Semali, 2024). The results resonate with Niwamanya et al. (2025), who emphasize the role of enterprise–TVET collaborations in supporting digital entrepreneurship in developing nations, and with Taofeek et al. (2025), who highlight sustained industry collaboration as key to fostering business readiness. Furthermore, Ogunsola (2023) and Selane and Odeku (2024) demonstrate that entrepreneurial success is enhanced where TVET institutions integrate soft skills and business literacy into curricula, an outcome more achievable through strategic PPP engagement. The positive coefficient in the current study, therefore, reflects PPP models’ potential in facilitating entrepreneurial ecosystems, particularly when focused on innovation-driven and market-relevant training.

Mediating Effect of Innovative Capacity on the Relationship between PPP Models and TVTE Graduate Employability

This outcome is not entirely unexpected, as previous studies have highlighted that PPP interventions may not automatically translate into employability gains without strong alignment between training content, labour market needs, and institutional delivery capacity (Mgaiwa, 2021; Matere, 2022; Ngesi et al., 2021). Weak institutional coordination, inadequate supervision of workplace training, and misaligned incentives between industries and training institutions often limit the employability benefits of PPP-based initiatives (Ahmad et al., 2021; Almeile et al., 2024). Moreover, the finding resonates with Agezew (2024), who demonstrated that higher education research and innovation practices did not always lead to improved employability unless they were embedded in labour market–responsive structures. Thus, while PPPs create opportunities for technical and entrepreneurial training, their capacity to enhance employability among graduates may be constrained in contexts where systemic weaknesses overshadow potential gains. This highlights the need for PPP frameworks that integrate not only skills transfer but also structured career support systems, mentorship, and alignment with local industry demands.

Mediating Effect of Innovative Capacity on the Relationship between PPP Models and Entrepreneurial Success

This aligns with prior studies emphasizing that innovation capacity, encompassing creativity, problem-solving, and the application of new knowledge, is a central determinant of entrepreneurial performance (Taleb et al., 2023; Çakır et al., 2022). Mutumba et al. (2020) similarly observed that PPPs in Uganda’s entrepreneurial ecosystem improved franchise sustainability largely through their support for innovative practices, while Yunus and Susanti (2021) found that PPPs promoted tourism development by stimulating service innovation. By embedding graduates in incubation hubs, co-designed curricula, and industry-driven projects, PPP models expose learners to real-world challenges that require adaptive, innovative solutions (Olando et al., 2024; Cheng et al., 2021). These findings demonstrate that innovative capability is not merely an added value but a key mechanism through which PPP models foster entrepreneurial outcomes. Thus, while PPPs alone may not guarantee employability improvements, their real strength lies in fostering innovation-oriented competencies that enable graduates to create, adapt, and sustain entrepreneurial ventures in dynamic market environments. This reinforces the argument that innovative capability should be viewed as a critical lever in PPP design and policy frameworks, especially in developing contexts such as Nigeria’s South-South region, where entrepreneurship is a vital engine of employment creation and economic resilience.



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Conclusion

This study examined the influence of Public-Private Partnership (PPP) models on the employability and entrepreneurial outcomes of TVET graduates in South-South Nigeria. Findings revealed that while PPP interventions significantly enhanced entrepreneurial success through incubation hubs, mentorship, and entrepreneurship initiatives, they negatively influenced employability, indicating a misalignment between PPP strategies and labor market demands. Graduates often lacked workplace readiness and transferable skills required by employers. Furthermore, innovative capability, tested as a mediating variable, did not significantly shape the relationship between PPP models and outcomes, highlighting gaps in current frameworks. Strengthening innovation, creativity, and problem-solving within PPP initiatives is essential to reducing graduate unemployment, closing skills gaps, and fostering inclusive economic transformation in Nigeria.

Recommendations

Based on the findings, it is recommended that:

1. Curriculum Reorientation: TVET institutions should redesign curricula to emphasize dual outcomes, employability, and entrepreneurship, through demand-driven training.
2. Industry Collaboration: Institutions should expand collaboration with private sector partners to provide internship placements, hands-on learning, and co-developed training modules.
3. Innovation Capacity Building: Training programs should include modules on creativity, problem-solving, and innovation management to build resilience among graduates.

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