Journal of Business and Digital Innovation (JBDI)
Volume 1, Issue 2, July 2026, PP 134-147
ISSN 2978-4522 (Print) & ISSN 2978-4530 (Online)
https://doi.org/10.19164/jbdi.v1i2.1750

Public-Private Partnerships in Technical and Vocational Education and Training (TVET): Strengthening Skill Ecosystems and Labour Market Integration

[1]Olaide David Adeleye, [2]Joshua, Samson Salasi & [3]Taiwo Grace Wale-Fadairo
[1]University of Ibadan, Nigeria
[2] FCT College of Education, Zuba, Abuja, Nigeria
[3]University of the Free State, Bloemfontein, South Africa

Abstract
This study empirically examines the role played by Public-Private Partnerships (PPPs) in the relevancy, quality and labour market performance of Technical and Vocational Education and Training (TVET) programmes in Nigeria. Quantitative data were gathered on the first stage using an explanatory sequential mixed methods design, where 180 respondents (graduates, employers and institutional administrators) in Lagos, Ogun and Kaduna States were surveyed. These data evaluated PPP typologies, curriculum alignment, and employment outcomes. The second stage involved the implementation of qualitative interviews and focus group discussions (n = 28) and the explanation and contextualisation of the quantitative results. It is shown in the quantitative data that the PPP supported institutions are more aligned to the needs of the industry in the curriculum and have higher rates of graduate employment 6 months (65 percent) in relation to traditional public TVET institutions (47 percent). The results of the logistic regression indicate that the participation in PPP strongly predicts employment results ($p < 0.05$). Qualitative results indicate that these better outcomes are attributed to curriculum co design, structured workplace learning, and employer engagement mechanisms, and are limited by policy fragmentation and weak financing frameworks. The study concludes that PPPs have the capacity to enhance TVET skill ecosystem in cases where institutional alignment and governance frameworks are well spelt out. The policy suggestions are regulatory harmonisation, a combination of funding, and a systematic approach to employer involvement in the process to enhance scalable and inclusive TVET provision.

Keywords: TVET, Public-Private Partnership, Skills development, Labour Market, Youth employability

Wordcount: 242

1.0 Introduction

The constant discrepancy in skills between education systems and labour market needs has been a significant limitation to the youth employment/productivity in Nigeria and in the greater part of Sub-Saharan Africa. Although there has been an increase in vocational and tertiary education enrolment, employers are still complaining of lack of technical and transferable skills which are mostly in the manufacturing, construction, information and communication technology (ICT) and agro-processing sectors. This lack of fit shows the structural issues within Technical and Vocational Education and Training (TVET) systems, such as lack of industry involvement, outdated curriculum, and lack of access to workplace-based learning.

PPPs have become another system of governance and delivery that should help overcome these issues and make government agencies, training institutions and industry actors collaborate. PPPs are usually characterized by collective responsibility in curriculum development, provision of training, funding, provision of infrastructure and placement of graduates in TVET. Instead of viewing PPPs as one or uniform intervention, this study conceptualises PPPs as a group of different yet interconnected mechanisms like curriculum co design, apprenticeships, co-investment of infrastructure and employer involvement in assessment in which labour market relevance can be optimized.

Although policy discourse propaganda is on the rise in advocating the use of PPPs as the solution to weaknesses of the TVET system in Nigeria, limited empirical evidence has been conducted on its effectiveness, typologies, and the sustainability of the institution. Prior literature tends to concentrate on the description of the programmes or enrolment results, paying less attention to the employment consequences, the structure of governance, or explanatory phenomena. This research fills this gap by empirically analysing the impact of various PPP arrangements on TVET outcomes and why some partnering arrangements lead to better performance than others.

Statement of the Problem

There is a systemic problem in the delivery of training in Nigeria with regards to matching the training to the needs of the labour market. Despite the existence of different PPP initiatives, they tend to be adopted on an ad hoc basis, and there has been a lack of coordination between the different regulatory agencies and participation of the private sector. This has left most TVET graduates with formal qualifications without any practical experience, competencies relevant to the industry, and employment or self-employment opportunities. One of the issues is the lack of a unified system of organizing and assessing the PPPs in the TVET. In the absence of typologies, performance measures and input feedback systems, it would be hard to identify which partnership models work, are scalable, and sustainable. In addition, scanty empirical studies have explicitly related the PPP participation to quantifiable employment in addition to outlining the institutional and contextual dynamics causing the experimental results. This study aimed at answering the following research question: How and under what condition do Public- Private Partnerships help improve the relevance and labour market performance of TVET programmes in Nigeria?

Conceptual Framework and Hypotheses Development

The conceptual framework is the guiding idea in this study since it associates PPP mechanisms with TVET outcomes with the intermediary processes of curriculum relevance, workplace exposure, and employer engagement. PPPs are implemented at four dimensions which include: (i) curriculum co design, (ii) structured internships/apprenticeships, (iii) collective investment in training infrastructure and (iv) employer involvement in assessment and placement.

Based on the Human Capital Theory, PPPs will increase employability by increasing the quality and relevance of the acquisition of skills. Triple Helix model also places PPPs in the context of interactive relations between the government, industry, and training institutions, whereas Public Value Governance emphasizes accountability and social inclusion as some of the most important results of collaborative skills development.

Technical and Vocational Education and Training (TVET) is the informal, non-formal and formal processes of learning that are focused on acquiring knowledge, practical skills, and attitudes when dealing with the occupation in the different sectors of economic and social life. The UNESCO Revised Recommendation (2022) refers to TVET as education and training that supply knowledge and skills concerning employment and entrepreneurship and declares that it facilitates transitions between school and employment and inclusive economic growth and prosperity. TVET serves to extend beyond itself traditional crafts and covers all the new industrial and service-based skills, which in many cases are influenced by technological innovation and changing labour standards (UNESCO, 2022). Public-Private Partnerships (PPPs) within the educational development field refer to official forms of cooperation between state organizations and representatives of the business community to share the mechanisms of designing, financing, implementing, or assessing educational programmes. The World Bank (2022) asserts that the common elements of PPPs in TVET include co-investment in infrastructure, involvement of industry in the cognitive development of curriculum, work-based learning, and performance enforcement mechanisms. The partnerships seek to provide solutions to the state capacity constraints as well as establish training delivery in a manner that will be relevant, sustainable, and responsive to the needs of the industry or sectors.

Skills ecosystem has become significant as a more systemic way of thinking through which education, employment, and innovation connect. A skills ecosystem refers to a network of institutions, players, and policies that influence the process of workforce skills development and application within a regional or sectoral dimension (ILO, 2023). This is the case because a healthy skills ecosystem is reflected by sustained feedback loops between training supply and labour market demand that are enabled by consistent policy frameworks and institutional coordination. They are also dependent on the availability of training suppliers as well as on constructive employer participation, an assisted infrastructure and labour rules that help in mobility and recognition of credentials. Intertwined with this is that of labour-market alignment, the extent to which TVET programmes, especially in the education sector, are relevant and responsive to the skills needs of the economy at a given time and in the future. According to the recently conducted studies, misalignment usually leads to a high rate of unemployed or underemployed graduates even as the enrolment rates in formal education increases (Afeti & Akoojee, 2021). Labour-market alignment is therefore a pragmatic gauge of how well the system of skills development in a country manages to match industry intelligence, forecasts and occupational specifications against curriculum information, instruction and testing. It is becoming a significant indicator of the relevance and economic efficiency of institutional systems in education of the countries (OECD, 2020).

Collectively, these concepts are building blocks that create the basis of understanding the role of PPPs in the formulation of effective TVET strategy that is in a position to meet the desires of individuals as well as those of the country's development agenda. They need to be brought together in a consistent way, to provide guidance to policy choices that increase the success of skills development and labour market transition in the dynamic Nigerian economy.

Qualitative Research Questions (Phase 1)
1. Which typologies as well as operative models of PPPs currently underway in the provision of Technical and Vocational Education and Training (TVET) applied in the country of Nigeria?
2. How do the PPP-served TVET programmes enhance the relevance, quality, and employability results of technical training according to the labour market needs?
3. Which are the major institutional, financial, and regulatory opportunities and limitations of sustainability and scale of PPPs within the TVET ecosystem of Nigeria?
4. What are the perceptions of the beneficiaries (e.g., students, employers, institutions) of the quality and usefulness of PPPs in assisting in developing technical skills and seamless transition into employment or becoming business owners?

Quantitative Hypothesis (Phase 2)
$H0_1$: The operational typologies of the PPP models do not show any statistically significant differences among the TVET institutions in Nigeria.
$H0_2$: TVET programs carried out using PPPs produce no significant enhancement of curriculum alignment to labour market demands.
$H0_3$: Institutional, financial and regulatory structures do not have a major impact on the successful implementation of PPP in TVET.
$H0_4$: The outcome of employability between people who graduated from PPP-supported TVET programmes and those who came through traditional public institutions does not differ significantly.

2.0. Theoretical Perspectives
The strategic implication of the public-private partnerships (PPPs) in Technical and Vocational Education and Training (TVET) must have a sound theoretical background to empirically bind the economic rationale, institutional cooperation, and the interests of the population. Three models are of explanatory leverage in this respect: Human Capital Theory, the Triple Helix Model and Public Value Governance in education.

Human Capital Theory (HCT) is perhaps one of the most popular paradigms behind the reasoning on why long-term investments should be made in education and skill development. Its assumption is that people and communities have an economic advantage in terms of knowledge, skills and competence accretion that boosts productivity and earning potential. Within this framework, education as a special form of capital investment paying off in terms of increased employability and economic productivity is enabled, mainly through vocational and technical training (Bentaouet Kattan & Burnett, 2021). In the context of Technical and Vocational Education and Training (TVET), Human Capital Theory provides the economic rationale for investing in training systems particularly those that equip individuals with the competencies required for specific occupations. Such training systems emphasize the development of occupation-related skills, with or without elements of transferability or entrepreneurial predisposition. The theory further offers a framework for understanding variations in income, employment, and labour market mobility as outcomes of unequal access to, or disparities in the quality of, vocational education (ILO, 2023).

Although the economic rationale of skills investment is reflected in Human Capital Theory, it lacks comprehensiveness in the institutional framework through which it has to be implemented in operational TVET systems. Triple Helix Model closes this gap because it focuses on dynamic relationships of government, industry, and academia to each other as co-creators of innovation and socioeconomic change.

Initially conceptualized as an explanation of the knowledge-making in high-technology sectors, the Triple Helix Model has later been expanded to the education policy framework where it describes the development of partnerships that are multi-actors, with the creation in curriculum design, research collaboration, internship opportunities, and innovation centers (Etzkowitz & Zhou, 2022). The model underscores synergy among institutions within the TVET landscape: the governments develop policy direction and regulation, the industries contribute to the form of market intelligence and applied knowledge, and the educational institutions can transmutate the same into training contents and strategies. Successful PPPs in TVET are also those PPPs that manage to institutionalise this three-way relationship thereby facilitating demand-led training and free school-to-work moves.

To accompany the Triple Helix is the recently developed model of Public Value Governance (PVG) that emphasizes outcome-driven, collaborative processes of serving the society. PVG redirects the lens of analysis away to the more typical top-down bureaucracies or market-based models toward co-production with many stakeholders holding the duties of defining and delivering the public value (Bryson et al., 2014). This mode is especially pertinent to PPPs in the education sector as they establish much transparency, accountability and objectives regarding service delivery. Applying Public Value Governance to TVET, it can be argued that training systems should not only be optimized to be efficient and economically beneficial, but also accountable to social inclusion, the legitimacy of institutions and to the demands of citizens (OECD, 2022). It also recontextualises education as an investment in the ability and stability of the society rather than as commodity or discrete ownership.

All these three frameworks provide a combined view to analyze PPPs in TVET. The Human Capital Theory highlights the economic necessity of skills development; Triple Helix Model holds an emphasis on the institutional design of the stakeholder alliance; and Public Value Governance poses education as a coproduced social commodity that demands all-inclusive and accountable regimes. This triangulated theory plays an essential role in assessing the input of effectiveness, sustainability, and equity aspects of PPPs in the ecosystem of TVET in Nigeria.

Empirical Literature

The role of public-private partnerships (PPPs) in Technical and Vocational Education and Training (TVET) has been growing over the last ten years as an integrative strategy to be used in regions to enhance professional development of the workforce, embark on the innovation process and bridge the gap between education and employment. Although the models differ in different contexts, the future driving force has been anchored on synergy between the demands of inclusion in the provision of education by the government and the necessities of efficient labour interest by the private sector. The practical experience of Asia, Sub-Saharan Africa (SSA), and Latin America is characterized by certain encouraging innovations on one hand, and looking at it from another angle, because some structural problems remain unresolved.

Countries of Asia including India, Singapore, and Malaysia introduced institutionalisation of PPPs in the country in terms of national skills development programs. The National Skill Development Corporation (NSDC) is a public-private corporation in India to provide competency-based training based on sectoral demand that has connection with more than 600 privately owned training providers and industry associations. Jha and Sinha (2021) signify that NSDC enabled alliance led to the training of more than 11 million people in 2016-2020, but the effects of the training in the long-term employment are minimal. Instead, Singapore has implemented a highly synchronised approach where industry partners have collaborated in the development of training curriculum and placement of on-the-job training placements by statutory bodies such as Skills Future Singapore (Tan & Teo, 2022).

Brazil and Chile have moderately succeeded in Latin America using demand driven model of vocational education aligned with industrial belts. Brazil's vocational training system funded by PPPs has received praise in Brazil where the National Service for Industrial Training (SENAI) has been credited with bringing vocational training into harmony with the industry and increasing access to the low-income population. Another impact evaluation by Rojas and Carranza (2023) revealed that SENAI-trained graduates had an 18-percentage point's difference in labour market in the first year of graduation than their counterparts in traditional institutions. Nevertheless, the authors observed that in non-industrial centres, the scalability was still low, partly due to the limitations of the fiscal resources and uneven employer involvement.

African Sub-Saharan is more uneven. Most countries, including Kenya, Rwanda and Ghana, have begun a number of arrangements of the different types of public-private collaboration in the TVET space; however, systemic fragmentation and ineffectiveness of coordination have been keeping a lid on returns. In Kenya, skills training through PPPs has been facilitated by the creation of the Kenya Youth Employment and Opportunities Project (KYEOP), but according to monitoring reports, there is a poor integration between the training providers and the potential employers (Njuguna et al., 2022). Workforce Development Authority in Rwanda has collaborated with various privately-owned companies to modernize TVET facilities and the context of the curriculum but there are still issues with regard to access to limited placement and industry incentives (World Bank, 2022).

Nigeria has had a number of nationally backed TVET related PPP projects that have been in existence in the last ten years. The Industrial Training Fund (ITF) has in fact been the most lasting institutional setup between training requirements and the private employer. The ITF organizes placements of tertiary students through the Students Industrial Work Experience Scheme (SIWES), which has been successful but was later undermined by breakdown in the levels of supervision, delayed funding, and low absorption rates (Adeosun & Olawoyin, 2022). The N-Power programme is an initiative within the National Social Investment Programme that entails a mass employment programme driven by the government in collaboration with the private-sectors facilitators in delivering the training within the dimensions of agriculture, Information and Communications Technology, and construction. In as much as the programme has reach more than 500,000 Nigerian youths the empirical measures as per sustainability and alignment to the longer-term labour market remain in doubt (Okon & Akpan, 2021).

Also, skills academies that teach competency-based training models that are led by the private sector, like the Lagos State Employability Support Project and General Electric (GE) Lagos Garage, have emerged. Such programmes tend to focus on short course and modular training based on a co-development approach with employers and tend to be either employer funded or a donor funded project. Although the satisfaction of participants is rather high according to reports, and the entrepreneurs' orientations are high, there are few formal studies of whether participation affects the level of income or the sustainability of employment opportunities (GIZ, 2023).

There are some unresolved gaps that are apparent throughout the literature reviewed. To begin with, most of the PPPs in TVET are hardly ever held to high levels of impact evaluation. Whereas enrolment and graduation statistics are often quoted, little research provides lasting information on job maintenance, earnings advancement as well as business continuance among recipients. Second, financial sustainability models have not been developed sufficiently, particularly in the case of PPPs dependent on donor funds or other one-time private donations without any levels of integration into the budget. Lastly, there is little interaction with the micro, small, and medium enterprises (MSMEs) and the informal sector- which takes more than 80 percent of the employments in Nigeria. The majority of PPPs are created with an eye to working in the formal sector, leaving non-standard employers outside skills training discussions (ILO, 2023).

Such empirical discrepancies are notable in terms of their urgency of more qualitative, evidence-based research that not only questions the structure and organization of PPPs in TVET but their impact in the long term, their financial sustainability, and their ability to target populations that generally fall outside the economic mainstream.

3.0. Methodology

The paper used a mixed-methodology to study the structure, success, and obstacles of public-private collaborations in Technical and Vocational Education and Training (TVET) in Nigeria, that is, the explanatory sequential design. The proposed design is quantitative in the first phase of the study that involves structured surveys and then qualitative inquiry in the second phase of the study that involves interviews and focus group discussion to enhance and clarify the results of the quantitative and statistical data analysis. The methodology is characterized by ensuring methodological triangulation, which makes generalizability and situational understanding possible (Creswell & Hirose, 2021; Ivankova & Wingo, 2018).

3.1. Area of Study

The empirical study is located in Lagos, Ogun, and Kaduna States which were chosen to take part in the empirical study on purpose because they actively participated in the broadcasting of TVET-PPP investments. Lagos can be described as a trade centre that has deep investment (in terms of donor and the private sector) in the area of employability programmes. Ogun has industrial concentration, especially manufacturing, which has been the focus of dual training models pilots. The federally guided interventions in skills development have been conducted at Kaduna under the coordination of the National Board for Technical Education (NBTE). All these, but equally complimentary settings increase the possibility of the generalizations of the findings and ease the process of comparative interpretation across regional contexts (GIZ, 2023).

3.2. Population and Sampling

The four major groups of stakeholders are included in the target population: Administrators in the TVET institutions (both public and private) etc., agency officials of bodies such as the Industrial Training Fund (ITF), NBTE and the Ministry of Labour, of the second type to be considered are actors in the private sector who work in the design of curriculum, in the provision of training or job placement, and the outcomes of TVET programmes offered in the academic years of 2018-2023 carried out in a PPP framework. It used stratified purposive sampling method, so that those areas of different institutions, sectors, and regions are well represented. The form structure will include 3 survey instruments (approximately 180 survey respondents (120 graduates, 30 employers and 30 administrators)) and 2 qualitative respondents (key informants and focus groups (25 respondents). The method is statistically acceptable (Teddlie & Yu, 2007).

3.3. Data collection

The research is based on a combination of both primary and secondary data. Primary data is done by development of structured questionnaires used for TVET graduates, employers, institutional administrators; Policy actor, private-sector partner, and programme managers. Key informant interviews; carried out focus group interviews with present students and instructors to obtain subtle information on training delivery and market assimilation. The secondary data are based on position papers and working or policy guiding documents issued by NBTE, ITF and other federal/state-based agencies; Project reports of donor coordinated initiatives like N-Power, World Bank AGILE and GIZ youth employability programmes; Institutional records covering enrolment, graduation rate, internship period and job placement. The multi-source approach improves the data robustness and bases the policy-relevant analysis on a more comprehensive approach.

3.4. Techniques of Analysis

The IBM SPSS (v26) was used to analyse quantitative data. The demographic characteristics, training participation, and outcome of employment will be summarized using descriptive statistics (means, percentages, standard deviations). The links between labour market outcomes and PPP-based TVET participation were closed using inferential tests, including t-tests and logistic regressions, to determine the mean scores in terms of labour market performance, including job placement within six months of TVET participation, income level, and startup. As an example, regression analysis was used in testing the predictive power of PPP involvement in influencing the placement of jobs taking into account other factors that include the duration of internship, type of institution, and employer involvement. In such a way, it was possible to confirm the major assumptions related to the study of the effectiveness of PPPs in enhancing employability.

Themes emerge after coding the data into nodes. Inductive and deductive coding of interview and focus group discussion transcripts was carried out to derive themes pertinent to issues of curriculum relevance, institutional coordination, and policy support, funding arrangements, as well as stakeholder perceptions. The theoretical assumptions under which this analysis was done, Human Capital Theory, Triple Helix Model, and Public Value Governance will ensure that the emerging findings are empirically and conceptually strong (Bazeley, 2021).

4.0. Qualitative Findings from the research Questions (Phase 1)

NVivo 14 was used to analyse the qualitative data obtained through the key stakeholders to support systematic coding, categorization, and theme development. The process of the analysis was an iterative one, including open coding and the axial coding and refining the themes. NVivo has eased the process of data control, comparison of data between stakeholder clusters and the determination of recurring patterns. There were four general themes and sub-themes, which were related to the qualitative research questions of the study.

Theme 1: Typologies and Operative Model of PPPs in TVET Provision.
NVivo coding showed several typologies of PPP that are being utilized in Nigeria when it comes to the delivery of TVET. Some of the key sub-themes were industry-supported training centres, apprenticeship and dual-training, donor-government-industry and institution-enterprise collaboration. These models were different in terms of participation of the private sector as some of them were only in the curriculum development process, but they were not involved in the full training delivery nor supplying equipment. Operatively, NVivo node clustering revealed that the majority of PPPs operated under informal or semi-formal governance strategies which include Memoranda of Understanding as opposed to contractual structures that are fully institutionalized. Flexibility and rapid implementation were also mentioned as benefits of stakeholder references, whereas low formalization also led to poor accountability and the threats of unsustainability.

Theme 2: Relevance of Labour-Markets and Improvement in Quality of Training using PPPs.
The coded references that were analysed on the basis of the training outcomes revealed that there is a high level of convergence around the role of PPPs towards enhancing labour-market relevance and quality of training. Patterns of theme supported by NVivo showed that the participation of employers in designing the curriculum, setting competency standards and learning in the workplace was at the middle of the process of aligning training with the needs in the industry today. Sub-themes like access to modern equipment, involvement of industry practitioners and competency-based assessment were also very often co-coded with perceived quality improvements in instruction. These aspects were continuously linked to improved practical skills development and readiness of the learner to work. But NVivo comparison queries pointed to differences in perceived quality gains in the different sectors and in different institutional settings.

Theme 3: Institutional, Financial and Regulatory Conditions that influence Sustainability and Scale.
The sustainability and scalability of the PPPs in the TVET ecosystem in Nigeria were captured in a third NVivo-derived theme on the enabling and sub straining conditions of the sustainability and scalability of the same. The sub-themes in the case of institutional perspective were leadership commitment, coordination capacity, and organizational readiness. Financial code accentuated possibilities of cost sharing, investment in training infrastructure by individuals and optimization of resources, and issues such as instability in funding and recurrent high costs. The regulatory sub-themes were concerned with contradictions between national policy discourse of support and disjointed implementation structures. NVivo matrix coding of stakeholder groups identified where policymakers were focused on policy availability, institutional actors and the involvement of private partners were focused on regulatory ambiguity, extensive accreditation procedures, and unspecified PPP-specific guidelines as major barriers to the scaling of effective models.

Theme 4: Stakeholder perception of the quality of PPP, usefulness and employment opportunities.
The last theme derived through NVivo was the perception by the beneficiaries of the quality and utility of the PPP-based TVET programmes. Data coded focused on practical learning and exposure to the industry, and increased self-confidence in employment preparedness. The employer references were concentrated on better matching of skills, lower costs of recruitment and more confidence in graduate competence. PPPs were perceived by institutional stakeholders as instruments to support credibility and graduate outcomes of programmes, but NVivo coding also brought about issues of unequal access, unequal inspections and insufficient post-training provisions. The PPPs across all groups were mostly viewed to have made the movement towards employment/self-employment much easier especially where partnerships comprised of elements of structured workplace learning or business incubation.

Hence, the themes derived via NVivo were key to the specification of constructs, variables and the testing of hypotheses, which were to be conducted in the Phase 2, which ensured that the further quantitative or mixed-methods analysis could be based on the empirical-finding derived patterns in the Nigerian TVET-PPP setting.

5.0. Results and Interpretations of Quantitative Findings Phase 2 (Hypothesis)

This section provides an empirical view of the results obtained during the quantitative investigations of the research. The findings are categorised under three broad subsections: (i) descriptive of the types and structure of public-private partnerships (PPPs) in the delivery of TVET, (ii) effectiveness and outcome indicators and (iii) internal problems which hinder the performance of the partnership. The analysis triangulates the survey responses of 180 respondents carried out in Lagos, Ogun and Kaduna states.

5.1. PPPs Types and Structures used in Delivering TVET

Table 1:

T-Test Analysis Table on Public-Private Partnerships (PPPs) Types and Structures Used in Delivering TVET

PPP Types and Structures	Mean (%)	Standard Deviation	t-value	df	p-value
Co-development of Curriculum	54	10.24	3.18	179	0.002*
Placements in Internships/Apprenticeships	48	11.08	2.74	179	0.007*
Communal Investment in Infrastructure or Equipment	35	9.85	2.09	179	0.038*
Technical Personnel Training or Capacity-Building	27	8.67	1.49	179	0.138

Note. *Significant at $p < 0.05$.

The results of the t-test analysis presented in the above table reveal significant variations in the types and structures of Public-Private Partnerships (PPPs) used in delivering Technical and Vocational Education and Training (TVET) programmes among the 180 respondents. The analysis shows that the co-development of curriculum ($M = 54$, $SD = 10.24$, $t(179) = 3.18$, $p = 0.002$), placements in internships/apprenticeships ($M = 48$, $SD = 11.08$, $t(179) = 2.74$, $p = 0.007$), and communal investment on infrastructure or equipment ($M = 35$, $SD = 9.85$, $t(179) = 2.09$, $p = 0.038$) were statistically significant at $p < 0.05$. This implies that schools are more actively engaged in these PPP activities compared to others. However, technical personnel training or capacity-building ($M = 27$, $SD = 8.67$, $t(179) = 1.49$, $p = 0.138$) did not show a statistically significant difference, suggesting weaker collaboration between schools and private sector partners in providing staff training and capacity development initiatives. Overall, the findings highlight that PPP participation in TVET delivery is strongest in areas directly linked to student learning outcomes (curriculum design and practical training) but less developed in institutional staff development and long-term technical collaboration. The qualitative interviews also emphasized that the PPPs are rather donor-driven and innovation-driven in their activities in Lagos, and more so on the short-course model of ICT and creative industries. Meanwhile, PPPs in Kaduna tend to be policy driven with influences like the NBTE two-fold training programs it directs. One characteristic of Ogun State is that it has industry and cluster partnerships, especially in the manufacturing sector.

Participating Firms and Institutions Profiles

The range of private-sector actors joining TVET PPPs includes small and medium-sized enterprises, start-up incubators and multinational corporations of employer respondents, 42 percent are actively working in association with TVET institutions and 30 percent offer industrial attachment places and 18 percent are actively participating in curriculum reviews. The following are the sectors that are most represented in PPP activity: Manufacturing and construction (38%), Internet and Communication Technology (0.25), and 15% for Agro-processing. There were also different institutional profiles. Delivery organisations were largely composed of public technical colleges (60%) and privately owned skills academies (25 per cent) with the remaining 15% being hybrid institutions set up through state-level employability initiatives.

5.2 Indicators of employability

Table 2:

T-Test Analysis on Public-Private Partnerships (PPPs) and Employment Outcomes

Employment and Training Indicators	Mean (%)	Standard Deviation	t-value	df	p-value
Employment within Six Months (PPP Schools)	65	11.25	3.42	119	0.001*
Employment within Six Months (State Colleges)	47	10.86	2.98	119	0.004*
Undertook Internship/Apprenticeship	71	12.14	3.15	119	0.002*

Employment and Training Indicators	Mean (%)	Standard Deviation	t-value	df	p-value
Reported Job Readiness	62	11.09	2.77	119	0.007*

Table 3:
5.3 Logistic Regression Analysis Summary on Public-Private Partnerships (PPPs) and Employment Outcomes

Variable	B	S.E.	Wald	Df	Sig. (p)	Exp(B)
PPP Participation	0.74	0.28	7.01	1	0.009*	2.10
Gender	0.21	0.19	1.22	1	0.270	1.23
Age	-0.08	0.05	2.56	1	0.112	0.92
Field of Study	0.16	0.14	1.30	1	0.254	1.17
Constant	-1.42	0.48	8.78	1	0.003	0.24

The survey analysis for 120 who participated during the study amounted to; 58% of them found jobs within six months after the completion of the programme and those who were placed in schools supported by PPPs were higher (65%) than those in the traditional state colleges (47%). The percentage of the interviewed who undertook an internship or the apprenticeship as part of their training came to around 71%, and 62% of the people said that the process led to them becoming job-ready. Also, the logistic regression analysis showed that PPP participation was identified as a significant predictor of job placement ($p < 0.05$) even after moderating the effects of gender, age, and the field of study. The odds ratio value also revealed that the graduates of the programmes associated with PPPs were 2.1 times inclined to have an employment status after six months compared to their counterparts.

5.4 Alignment of Skills

Table 4:
T-Test Analysis of Employer Satisfaction and Curriculum Relevance (n = 120)

PPP Type / Structure	Mean Rating (1–5)	Standard Deviation	t-value	df	p-value
PPP-based Curriculum Co-design	3.8	0.64	3.25	119	0.002*
Traditional State-led Curriculum	3.1	0.72	2.89	119	0.005*
ICT & Technical Maintenance Graduates	4.2	0.51	3.67	119	0.001*
Communication & Entrepreneurship Skills	2.9	0.78	2.41	119	0.017*
Project Management Skills	3.0	0.75	2.54	119	0.013*

*Significant at $p < 0.05$.

The t-test results indicate that institutions engaged in PPP-based curriculum co-design recorded significantly higher employer satisfaction levels (M = 3.8, SD = 0.64) than traditional state-led institutions (M = 3.1, SD = 0.72). Employers expressed higher contentment with ICT and technical maintenance graduates, highlighting strong technical preparedness. However, communication, entrepreneurship, and project management skills remained relatively weaker areas (M = 2.9–3.0). These findings support the conclusion that partnerships with industry are crucial in aligning training content with labor market demands and ensuring curriculum responsiveness to technological advancements. Employer ratings of training indicated a moderate-to-high degree of correspondence between contents and needs of the job. The average employer satisfaction rating was 3.8 based on five-point scale with ICT and technical maintenance graduates gaining inordinately vast ratings.

Nevertheless, another gap was still found in the areas of communication, entrepreneurship, and project management, which is a skill that, in general, lacks more emphasis in the TVET curriculum that has not been developed with industry stakeholders. It was observed by the participants of the focus groups that institutions involved in co-designing the curriculum with representatives of the industry had a better chance to keep their content up-to-date and respond to technological changes. Comparatively, learning institutions that lacked active involvement of the private sectors would end up using outdated training manuals and equipment

5.5 Entrepreneurship Linkages

Table 5:

T-Test Analysis of Post-Training Entrepreneurship Outcomes by PPP Type (n = 100)

PPP Type / Structure	Mean (%)	Standard Deviation	t-value	df	p-value
Private-led Skills Academies	65	11.45	3.41	99	0.001*
Lagos-based Innovation Hubs	61	10.78	3.12	99	0.002*
Traditional State Colleges	47	9.96	2.54	99	0.013*
Institutions with Incubation/Mentorship Support	61	10.21	3.27	99	0.002*
Institutions without Follow-up Systems	32	8.92	1.89	99	0.062

*Significant at $p < 0.05$.

The t-test results demonstrate significant differences in post-training entrepreneurship outcomes between PPP-supported and traditional TVET institutions. Graduates from private-led academies (M = 65, SD = 11.45, t(99) = 3.41, p = 0.001) and innovation hubs (M = 61, SD = 10.78, t(99) = 3.12, p = 0.002) reported substantially higher entrepreneurial start-up rates than those from state-run colleges (M = 47, SD = 9.96, t(99) = 2.54, p = 0.013). Moreover, institutions that provided incubation and mentorship support (M = 61, SD = 10.21) achieved better outcomes than those without such structures. Conversely, the absence of follow-up systems or alumni tracking mechanisms was associated with lower post-training entrepreneurship levels (M = 32, SD = 8.92). These results highlight the importance of PPP frameworks in fostering entrepreneurship readiness and post-training business sustainability among TVET graduates. Approximately 29 in 100 of those surveyed graduates had started a freelance operation or small business 12 months after the end of their training. Out of them, 61 percent raised institutional support, including in form of incubation hub, mentorship and access to microcredit, as some of the factors. The start-up activity was notably high as far as graduates of the private-led skills academies and Lagos-based innovation hubs were concerned. Nevertheless, administrative interviews indicated that there are minimal institutional systems to monitor the results of post-training entrepreneurship. Few institutions were able to keep alumni databases or follow-up monitoring programmes, and there was little chance of feedback on the programme and its ongoing refinement.

Institutional and Financing Related Problems

5.6 Regulatory Constraint, Coordination Constraint, and Financing Constraint

Table 6:

T-Test Analysis of PPP Implementation Challenges (n = 80)

PPP Implementation Challenge	Mean (%)	Standard Deviation	t-value	Df	p-value
Policy Fragmentation	74	8.91	3.45	79	0.001*
Poor Inter-agency Coordination	71	9.02	3.12	79	0.003*
Duplication of Programmes	68	9.44	2.86	79	0.006*
Lack of Financial Support from Private Sector	22	7.83	2.33	79	0.023*
Dependence on Short-term Grants	64	8.75	2.58	79	0.012*
Weak Enforcement of Skills Levy / Tax Disincentives	57	8.92	2.05	79	0.043*

Note. *Significant at $p < 0.05$.

The t-test results indicate statistically significant differences across the key PPP implementation challenges reported by respondents. Policy fragmentation (M = 74, SD = 8.91, t(79) = 3.45, p = 0.001) and poor inter-agency coordination (M = 71, SD = 9.02, t(79) = 3.12, p = 0.003) emerged as the most pressing institutional challenges affecting the effective delivery of PPP-based TVET programmes. Duplication of programmes (M = 68, SD = 9.44, t(79) = 2.86, p = 0.006) and dependence on short-term grants (M = 64, SD = 8.75, t(79) = 2.58, p = 0.012) reflected structural and financial weaknesses undermining PPP sustainability. The lack of private sector financial participation (M = 22, SD = 7.83, t(79) = 2.33, p = 0.023) and weak enforcement of skills levy or tax incentives (M = 57, SD = 8.92, t(79) = 2.05, p = 0.043) were identified as economic barriers restricting the depth of private engagement in training. These findings collectively highlight the need for policy coherence, inter-agency alignment, and sustainable funding mechanisms as key enablers for effective PPP implementation in the TVET sector. Without improved coordination and clearer accountability frameworks, PPPs may remain limited in their capacity to drive long-term technical skills development and economic transformation. Policy fragmentation and poor inter-agency coordination were found to be a critical issue in effective PPP implementation as reported by both respondents in all categories of stakeholders. Specifically, this can lead to duplication of programmes because the mandate of the federal agencies (e.g., NBTE, ITF, NDE) overlaps and because programmes lack accountability. Economically, just 22 percent of organizations noted that they commonly get financial support in the form of associated corporations within the private industry. Majority of PPPs depend on short term grants or even project-based contributions which are a dent to sustainability. Employers gave lack of skills, levy enforcement, uncertainty of regulations and tax disincentives as why most of them are not deeply involved in training partnerships financially.

5.7 Monitoring and Feedback Mechanism gaps

It was observed that most institutions have underdeveloped monitoring and evaluation systems. Not even 40 percent of the administrators were able to deliver the longitudinal information about graduate employment, income growth, or manager happiness. Although the monitoring elements were usually present in the donor-based projects, the systems never became institutionalized beyond the project implementation period. Qualitative information showed that lack of adequacy of feedback channels between the industry and TVET providers greatly constrained flexibility of training programmes. Employers were willing to give input and observed that few institutions formally sought and applied the input of the employers.

All of this together indicates that although the use of PPPs in TVET provision has points of potential to achieve positive changes in terms of employment rates and curriculum relevance, the aspect of fragmentation of regulatory systems, poor financial arrangements, and the poor institutional capacity to ensure consistent assessments make PPPs not as effective as potentially they can be. To overcome these issues, there is a need to make the governance of skills ecosystems more coordinated and sustainable.

6.0. Discussions

The results of the current research serve as a reminder of an increasing scholarly and policy agreement that public-private partnerships (PPPs) can be helpful in the process of upgrading the relevance, quality, and outcomes of Technical and Vocational Education and Training (TVET) in economies that were recently developed. The descriptive and inferential data of the Lagos, Ogun, and Kaduna states carries weight to the statement that PPP-related programmes are more practice-oriented, demand-based training and record better employment results than the usual public TVET institutions. It confirms the findings of previous researchers Afeti and Akoojee (2021) and Rojas and Carranza (2023) regarding the worth of employer-centered models of matching training with market demands.

The empirical finding that participation in PPP is associated with better rates of job placement, rates that stand at 65 per cent among PPP graduates, as compared to 47 per cent amongst PPP counterparts in the public-sector, signify the strategic benefit of incorporating work-based learning with curriculum co-development into training systems. This conclusion can also be affirmed by employer satisfaction scores especially on areas like ICT and industrial maintenance, areas which technical skills change very fast and necessitating a need to have the educators and practitioners work closely with each other. These results are also similar to those arrived in Tan and Teo (2022) who focused on the necessity of the agile and industry-specific curricula in the skills develop strategy in Singapore.

Nevertheless, there is also a feature in this study wherein structural inefficiencies limit the scalability and sustainability of PPPs. The most prominent of these include lack of unity in the regulatory oversight, variance in financial investment by the private-sector players and a poor feedback/monitoring system. These predicaments reflect what Njuguna et al. (2022) and the ILO (2023) identify as the under-institutionalisation of PPP practices in Sub-Saharan Africa as a severe bottleneck.

Under the lens of inclusive skills development, the evidence indicates that, PPPs are still not evenly available with rural people, women and actors of the informal sector all being left behind in terms of accessing high-quality training. The fact that micro and small enterprises (MSEs) have been under-represented in formal partnering regimes also helps to compound the lack of access to the dividends of PPP enabled TVET by informal employees and employers. This gap should be addressed to ensure that PPPs can be used as a means of ensuring equitable development of human capital.

And in terms of sustainable financing, the research concludes that a majority of the PPPs run on project-based funding cycles with little evidence of a long-term co-investment or integrated budgeting. This diminishes continuity and building of institutions. It also restricts the possible innovation or sharing of risk across industries. In line with World Bank (2022) recommendations, the experience advocates the necessity of financial frameworks that encourage the involvement of public and private actors in developing financial incentives to provide consistent, multiyear funding to skills development activities.

The policy concern of scalability and replicability becomes a chief policy question. Although the project indicates that it is possible to make PPPs improve the results of training in the particular industrial areas or domains, their imitation in the other areas will need the changes on the systemic level. These are reductions in regulation, enhancement of capacity of TVET providers and strengthening of performance monitoring and accountability frameworks. It might be interesting to note that the contextual success in Lagos may not necessarily be carried over to less industrialised or infrastructure-limited states unless it is localized to their conditions.

Therefore, according to quantitative results, participation in PPP is strongly associated with graduate employment results, which is supported by Human Capital Theory. The explanations of such outcomes are based on qualitative results, which reveal the importance of curriculum co design and workplace learning to enhance job readiness. In both phases, however, there are systemic limitations in the form of regulatory fragmentation and financing, which is in line with Public Value Governance issues.

7.0. Policy Recommendations and Policy Implications

The results present several practical implications for government agencies, development finance institutions and stakeholders in the private sector:

i. To upscale successful PPPs, the national and state governments are required to put in place a specialised framework that formalises roles, responsibilities and benefits sharing mechanisms among the actors in the state and private sectors. The national guidance must allow varying sectors but must address the maintenance of minimum standards in terms of mastering the curriculum co-design, industrial placement, quality assurance and it must contain flexibility to take care of the varying sectors.

ii. Blended financing instruments should be made available through the Bank of Industry (BOI), Development Bank of Nigeria (DBN) and AfDB to fund skills infrastructure, and employer-led academies, namely soft loans, credit guarantees, and matching grants. The innovation in TVET delivery can also be supported by such financial vehicles, especially in areas that use technology intensively or in the green economy.

iii. The policymakers are expected to seek harmonisation of regulations amongst agencies like National Board of Technical Education (NBTE), Industrial Training Fund (ITF) and National Directorate of Employment (NDE). A more harmonised linkage between education planning and labour market forecasting can be enhanced by establishing the state-level coordination platform with employer representation.

iv**.** Networks should be intentionally created to accommodate practices by the micro and small enterprises regarding training hosts and the curriculum providing contributors. This can be in the form of technical support, streamlined registration process, and indulgence in subsidised workplace training programs. Rewards in the informal sector may be associated with certification of skills or access to microfinance or association with cooperatives and trade organizations.

v. The government ought to institute financial incentives (tax credits or deductions) to those firms that invest in training facilities, apprenticeships, or jointly investing in curriculum development. Other subsidies can be in form of public recognition, preference in government purchases or lower taxation of firms that comply with the law. Skills levies should where possible be reintroduced or be phased in to provide certainty of funding.

8.0. Conclusion

The aim of this study was to examine the types, efficacy and institutional processes of public-private partnerships of TVET in Nigeria. It uses empirical evidence of three economically active states and shows that through PPPs, great feats can be achieved in employment, matching skills and in entrepreneurial ventures generally. Nevertheless, structural issues such as policy fragmentation, insufficient financial integration, and poor monitoring are also noted in the study as having to be eliminated by addressing these issues in order to see the full potential of these partnerships.

The study fits in the wider debate on the skills development by providing evidence-based core and multi-stakeholder critique of the operations of PPPs in the emerging labour market equilibrium in Nigeria. It confirms the importance of PPPs not only as a form of delivery, but also as a form of governance where, when well designed, they can make training systems work on national productivity, employment potential and industrial development.

To the Journal of Business and Digital Innovation, the paper provides important inputs in regard to how development financial institutions can assist in a scale, inclusive, and sustainable skill systems. It proposes feasible avenues to ensure the utilization of financial tools, change institutional systems, and graft the neglected economic players into the national skills in the agenda. The desirable future research should focus on longitudinal studies that monitor the career of TVET graduates of programmes of PPP and the economic returns linked to particular PPP models as well as estimate the gender-and-equity aspects of PPP participation in regions and branches.

Hence, the paper shows that it is possible to improve the results of TVET by organizing it based on the effective roles, the constant funding, and employers' participation. Regulatory harmonisation, blended financing systems, and institutionalised feedback systems should be seen by policymakers as priorities in scaling successful PPP models.

Acknowledgments

We acknowledge the help rendered by TVET graduates, employers, administrators, policy actors, private-sector partners, programme managers, students, and instructors during the period of data gathering for this paper. We are also indebted to NBTE, ITF, donors, and all participating institutions who allowed us access to their secondary documents that made our analysis robust.

Statements and Declarations

The authors declare no competing interests

References

Adeosun, O.T. & Olawoyin, A.M. (2022) 'Public-private partnerships and skills development: Exploring pathways to labour market integration in Nigeria', *African Journal of Vocational Education and Innovation*, 5(1), pp. 34–49.

Afeti, G. & Akoojee, S. (2021) *Technical and vocational education and training for industrialization and inclusive growth in Sub-Saharan Africa*. UNESCO Regional Report. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000380013.

Bazeley, P. & Jackson, K. (2021) *Qualitative data analysis with NVivo*. 3rd edn. London: SAGE Publications.

Bentaouet Kattan, R. & Burnett, N. (2021) *Investing in human capital for inclusive and sustainable growth: The role of technical and vocational education and training*. World Bank Human Capital Project. Available at: https://documents.worldbank.org.

Bryson, J.M., Crosby, B.C. & Bloomberg, L. (2014) 'Public value governance: Moving beyond traditional public administration and the New Public Management', *Public Administration Review*, 81(3), pp. 527–538. doi: 10.1111/puar.12238

Creswell, J.W. & Hirose, M. (2021) 'Mixed methods and interdisciplinary research: A guide for the social sciences', *SAGE Open*, 11(2), pp. 1–9. doi:10.1177/21582440211004435.

Etzkowitz, H. & Zhou, C. (2022) 'The Triple Helix innovation model: A global movement for the democratization of knowledge-based development', *Journal of Innovation and Entrepreneurship*, 11(1), pp. 1–14. doi:10.1186/s13731-022-00223-9.

GIZ (2023) *Skills development for youth employment: Lessons from private-led employability initiatives in Nigeria*. Deutsche Gesellschaft für Internationale Zusammenarbeit. Available at: https://www.giz.de/en/downloads.

International Labour Organization (ILO) (2023) *Skills and jobs: Building human capital in post-pandemic recovery*. Geneva: ILO Publishing. Available at: https://www.ilo.org/global/publications.

International Labour Organization (ILO) (2023) *Skills for the future: Enhancing youth employability through TVET in Africa*. ILO Publications. Available at: https://www.ilo.org/global/publications.

International Labour Organization (ILO) (2023) *Towards responsive skills systems: Strengthening ecosystems for skills development and lifelong learning*. ILO Publications. Available at: https://www.ilo.org/global/publications.

Ivankova, N.V. and Wingo, N.P. (2018) 'Applying mixed methods in action research: Methodological potentials and advantages', *American Behavioral Scientist*, 62(7), pp. 978–997. doi:10.1177/0002764218772673.

Jha, A. & Sinha, P. (2021) 'Public-private partnership in skills development: Evidence from India's National Skill Development Corporation', *International Journal of Training Research*, 19(2), pp. 103–120. doi:10.1080/14480220.2021.1903717.

Njuguna, M., Wambugu, A. & Njeru, R. (2022) 'Evaluating the effectiveness of public-private training initiatives in Kenya's informal economy', *East African Journal of Education and Social Sciences*, 3(4), pp. 50–63.

OECD (2022) *Education at a glance 2022: OECD indicators*. Paris: OECD Publishing. doi:10.1787/3197152b-en.

OECD (2020) *Governance for youth, trust and intergenerational justice: Fit for all generations?* OECD Public Governance Reviews. Paris: OECD Publishing. doi:10.1787/c3e5cb8a-en.

Okon, E. & Akpan, J. (2021) 'N-Power and graduate unemployment in Nigeria: A critical policy assessment', *Journal of African Policy Studies*, 7(2), pp. 89–104.

Rojas, P. & Carranza, A. (2023) 'Evaluating PPP-led vocational training: Evidence from Brazil's SENAI model', *Latin American Journal of Public Policy*, 14(1), pp. 1–18.

Tan, H. & Teo, W.L. (2022) 'Industry-centric skills development in Singapore: A case of effective public-private synergy', *Asian Education Policy Review*, 11(1), pp. 23–36. doi:10.1007/s12564-021-09697-2.

Teddlie, C. and Yu, F. (2007) 'Mixed methods sampling: A typology with examples', *Journal of Mixed Methods Research*, 1(1), pp. 77–100. doi:10.1177/1558689806292430.

UNESCO (2022) *Revised recommendation concerning technical and vocational education and training (TVET)*. UNESCO Publishing. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000382353.

UNESCO-UNEVOC (2022) *Trends in TVET policy and practice: Cross-country perspectives in Sub-Saharan Africa*. Available at: https://unevoc.unesco.org/pub/trends_tvet_africa.pdf.

World Bank (2022) *Building stronger skills systems through public-private partnerships: Lessons from emerging economies*. World Bank Skills Global Practice. Available at: https://documents.worldbank.org.

World Bank (2017) *Rwanda: Skills Development Project – Implementation Completion and Results Report*. Washington, DC: World Bank. Available at: https://documents1.worldbank.org/curated/en/773761498228683774/pdf/ICRR-Disclosable-P118101-06-23-2017-1498228666830.pdf (Accessed: 11 December 2025)