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TVET-Industry Misalignment and the Limits of Competency-Based Training Reform in Garment Sector Workforce Development

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Abstract: This study systematically surveys 37 Technical and Vocational Education and Training (TVET) institutions in Ghana's Volta Region to examine the implementation of Competency-Based Training (CBT). Since the establishment of the National Technical and Vocational Education and Training Qualifications Framework, CBT has emerged as the primary reform model in Ghana. However, findings indicate that although 74.19% of institutions formally adopt CBT, substantial institutional weaknesses hinder its effective implementation, leaving graduates not fully prepared for the workforce. Notably, only 18.92% of institutions use simulated production-line assessments or engage industry co-assessors, and none offer enterprise resource planning training. Additionally, formal employment placement in garment factories averages only 20.70%, even among the most robust governance types. Grounded in institutional theory and skills ecosystem frameworks, this paper argues that a disconnect exists between the formal adoption of CBT and its practical application. Institutions maintain CBT's procedural elements primarily to secure accreditation while retaining traditional, craft-oriented teaching methods. A TVET Alignment Diagnostic Tool has been developed to evaluate institutional-industrial fit across six dimensions, revealing that no governance category aligns with the requirements of export-oriented garment manufacturing and that deficits are systemic. The study proposes a public-private co-governance model for TVET reform that

emphasises demand-side accountability, outcome-based financing, and shared infrastructure, offering insights applicable to skills planning across Sub-Saharan Africa.

Keywords: competency-based training, TVET governance, skills ecosystem, institutional theory, garment manufacturing, Ghana.

Introduction

Ghana's Commission for Technical and Vocational Education and Training has positioned Competency-Based Training as the cornerstone of its national qualifications reform agenda, committing to align all accredited programmes with the National Technical and Vocational Education and Training Qualifications Framework. The policy logic is compelling: by anchoring training delivery in defined, observable competency standards rather than time-served attendance, CBT promises to close the gap between graduates' capabilities and labour market requirements in sectors such as export-oriented garment manufacturing, where productivity depends on operational precision. Adherence to quality standards and, increasingly, to digital production systems, and the alignment of training with clearly specified industry competencies are not marginal refinements but operational prerequisites. Recent sector-specific work on Ghana's textile and apparel industry reaches a similar conclusion, identifying skills shortages, limited access to practical training, fragmented stakeholder coordination, and curriculum-relevance problems as core constraints on industrial upgrading and labour market responsiveness (Anyigba et al., 2024).

The evidence presented in this paper suggests that this alignment has not been achieved. Drawing on a systematic institutional survey of 37 TVET providers serving Ghana's Volta Region industrial corridor, the planned site of a Garment and Apparel Industrial Park commissioned by the Ghana Export-Import Bank, documented a pattern that institutional theory would identify as ceremonial adoption. Institutions have adopted CBT's formal markers while preserving the inherited pedagogical model calibrated for artisanal and domestic tailoring rather than for industrial export production. The result is a system that formally satisfies the accreditation conditions while failing to meet the conditions for factory-ready graduate output.

This finding carries significance beyond its local context. CBT reform has been exported across Sub-Saharan Africa as a near-universal TVET policy prescription, typically through aid conditionality and technical assistance programmes led by the International Labour Organisation, the World Bank, and bilateral donors (Allais, 2012; McGrath & Lugg, 2012). More recent comparative evidence from African VET systems suggests that occupational standards and competency-based qualifications often serve as administratively legible reform instruments without necessarily strengthening the substantive relationship between training and workplace capability, particularly where labour markets are highly informal, and employer coordination is weak (Allais, 2023). Ghana is neither the first nor the only country to adopt CBT's formal architecture while struggling with its substantive implementation. The Ghanaian garment sector case, therefore, offers a theoretically instructive illustration of a systemic reform failure, with causes and remedies that carry broad analytical and policy relevance.

The paper makes three core contributions. First, it offers a granular, multi-dimensional empirical account of CBT implementation quality in a developing-country TVET system, moving beyond binary adoption measures to map the specific institutional practices through which form diverges from substance. Second, it develops a TVET Alignment Diagnostic Tool that operationalises six dimensions of institutional-industrial fit and produces a composite Alignment Index across governance types. Third, it proposes a public-private co-governance model for TVET reform that reintroduces the employer demand side as a structural rather than consultative actor, thereby addressing the central mechanism sustaining ceremonial adoption.

Purpose of Study

The research examines the adoption of competency-based approaches by TVET institutions and explores how they link with industry to train graduates for the apparel manufacturing sector.

Literature Review

CBT as a Policy Technology in Sub-Saharan Africa

Competency-Based Training emerged from the occupational analysis tradition of North American vocational education in the 1970s and was progressively globalised through the 1990s as development agencies adopted it as a key instrument of TVET modernisation (Wolf, 2011; Brockmann, Clarke, and Winch, 2011). Its theoretical promise rests on three claims: that competencies can be specified in advance through analysis of occupational practice; that training delivery can be structured to reliably produce those competencies; and that competency assessment can provide a market-legible signal of graduate capability, thereby bypassing the credential inflation associated with general education qualifications.

In Sub-Saharan Africa, the adoption of CBT has been driven less by endogenous employer demand and more by the priorities of external development partners, whose financing was conditional on the adoption of the framework (Allais, 2012). This supply-side dynamic of reform diffusion creates the conditions for what Allais terms 'paperwork qualifications', systems in which the administrative apparatus of competency frameworks, unit standards, and credit accumulation is elaborate. At the same time, the actual quality of training provision remains unchanged. McGrath and Lugg (2012) identify this as a structural feature of TVET reform discourse in the region, in which international consultants produce framework documentation without adequate attention to the institutional conditions required for those frameworks to function as intended.

The consequence for sector-specific workforce development is that CBT adoption does not automatically deliver the industry alignment it promises. Oketch (2007) and Pilz (2012) observe that CBT's effectiveness in developing-country contexts depends critically on the strength of employer engagement in competency specification and assessment. Where employer engagement is weak or absent, competency frameworks become backwards-looking documents that codify current training content rather than forward-looking specifications of industry requirements. This is precisely the dynamic illuminated by evidence from the Ghanaian garment sector. Indeed, recent scholarship argues that competency-based qualifications in African VET systems frequently privilege task codification and framework compliance over contextually grounded occupational formation, thereby creating the appearance of responsiveness without guaranteeing transformation in pedagogy, equipment use, or labour market outcomes (Allais, 2023).

Institutional Theory and Ceremonial Adoption

Institutional theory provides the analytical tools for explaining why organisations adopt reforms without implementing their substantive content. Meyer and Rowan's (1977) foundational account of the relationship between formal organisational structure and actual practice identifies decoupling as a characteristic response to conflicting institutional pressures. Formal compliance with external expectations is maintained while internal operations continue according to their own logic. DiMaggio and Powell's (1983) elaboration of isomorphic pressures specifies three mechanisms by which this decoupling occurs. Coercive isomorphism arises when regulatory requirements compel formal adoption. Mimetic isomorphism occurs when organisations imitate the forms of apparently successful peers. Normative isomorphism operates when professional communities diffuse shared conceptions of appropriate practice.

Applied to TVET reform, these mechanisms explain the CBT adoption pattern documented in this paper. Coercive pressure from CTVET's accreditation requirements creates a direct incentive to comply with formal CBT, regardless of whether that compliance entails substantive pedagogical transformation. Mimetic pressure among TVET institutions drives convergence on shared CBT documentation practices. Normative pressure from the TVET professional community, shaped by donor-funded trainer development programmes, promotes a conception of 'good TVET' defined by adherence to frameworks rather than by graduate employment outcomes. The institutional environment thus systematically rewards the adoption of form while providing weak incentives for substantive implementation.

North's (1990) distinction between formal and informal institutions adds another explanatory layer. Formal institutions are codified rules; informal institutions are the conventions, norms, and routines that govern actual behaviour. CBT reform changes formal institutions without necessarily transforming the informal institutional logic that shapes daily training practice. In Ghana's TVET context, the informal institutional logic inherited from the craft apprenticeship tradition privileges the transmission of tacit knowledge from master to apprentice over the systematised demonstration of competencies prescribed by CBT. This informal logic is reproduced in training content oriented towards domestic tailoring, in assessment practices that prioritise the finished garment as a holistic artefact rather than a disaggregated demonstration of competencies, and in the absence of factory-floor experience among instructors who have learned their craft in tailoring workshops.

Skills Ecosystem Frameworks

Skills ecosystem frameworks offer a complementary analytical lens, conceptualising skills formation as a systemic property of labour markets rather than an output of individual training institutions. Finegold's (1999) foundational account of high- and low-skill equilibria shows that training and production systems co-evolve: firms competing on quality and product complexity demand and reward high skills; training institutions respond by developing those skills; and workers invest in acquiring them because returns are high. Low-skill equilibria are self-reinforcing in the opposite direction. Buchanan and colleagues (2017) extend this to the concept of a skills ecosystem, in which training quality is determined not by any single institution but by interactions among training providers, employers, labour market intermediaries, and regulatory bodies.

The skills ecosystem framework predicts that TVET reforms targeting training providers in isolation will fail if the demand side of the ecosystem remains underdeveloped. In the Volta Region's garment context, the formal garment sector is thin, with few export-oriented employers able to exert demand-side pressure on training quality. Without employers who specify their needs, audit what they receive, and invest in what is missing, training institutions face no market accountability for the gap between CBT documentation and factory-ready graduate output. The result is the low-skill equilibrium the data reveal: graduates who self-employ as informal tailors, institutions that train for that market, and a persistent absence of the industrial competency pipeline that export-competitive garment manufacturing requires. Recent review evidence from Ethiopia reinforces this interpretation, showing that TVET-industry linkage improves employability only where institutions and firms share responsibility for curriculum design, workplace exposure, and assessment, rather than treating employer engagement as a periodic consultative exercise (Kebede et al., 2024).

Methodology

The empirical foundation of this paper is a systematic institutional survey of 37 TVET providers conducted as part of the Ghana EXIM Bank Human Capital Survey for Garment and Apparel Industrial Park Development in Ghana's Volta Region (GEXIM, 2025). The survey adopted a near-census design, targeting all identifiable technical and vocational education and training institutions within the project catchment

area, encompassing public TVET colleges (n = 13, representing 35.14 percent of the sample), private for-profit training centres (n = 10, 27.03 percent), universities with fashion or textile programmes (n = 7, 18.92 percent), master-craftsperson clusters and association-based training arrangements (n = 6, 16.22 percent), and one mission-based institution (2.70 percent).

The institutional survey instrument was structured around seven thematic domains: governance and accreditation status; programme offerings and curriculum content; instructor qualifications and industry experience; student enrolment and gender composition; graduate outcome tracking mechanisms; work-based learning and industry linkage arrangements; digital skills and sustainability content coverage; and operational constraints and financing structures. For specialist technical questions, survey administration involved collaboration with institutional representatives and, where available, the institutions' technical staff. All data were captured via Kobo Toolbox and analysed in Stata, with cross-tabulations disaggregated by governance type as the primary comparative framework.

The TVET Alignment Diagnostic Tool (TADT), developed in Section 5, was constructed post hoc from the survey data using a scoring rubric derived from the competency requirements of export-oriented garment manufacturing established in the companion household skills survey (n = 3,864). The rubric was developed with reference to the ILO garment sector competency framework (ILO, 2016) and international benchmarks from comparable garment-industry park TVET programmes in Bangladesh, Ethiopia, and Kenya. Each of the six TADT dimensions was scored on a three-point scale as absent (0), partial (1), or substantive (2), and institution-type means were computed to generate a composite Alignment Index by governance category. The resulting index represents a diagnostic instrument designed to guide institutional planning rather than to rank individual institutions.

Ethical Issues

Research involving human subjects is complex and governed by ethical principles (Creswell, 2009). Before data collection, in addition to approval from the Council for Scientific and Industrial Research (CSIR) Institutional Review Board (CSIR-IRB/RPN069/2025), individual consent (verbal and written) was obtained from each participant (Christians, 2005). It was emphasised that the research would not cause harm, and participants were informed of their right to withdraw and of the safeguarding of their anonymity and confidentiality.

Limitations

The study covered Dabala, Akatsi, Anloga, Afiadenyigba, Agbozume, Abor, Denu, Dzodze, and Keta in Ghana's Volta Region, the planned location of a Garment and Apparel Industrial Park. Although the study would have included other regions, the intended project is within the catchment area from which the data were collected. This narrowed scope may affect the generalisability of the findings.

Results

Demographic Result

The demographic profile of the surveyed workforce confirms a substantial female labour force. Women constitute 70.63% of respondents (n = 2,729), with female dominance consistent across all nine communities, ranging from 56.16% in Agbozume to 82.62% in Dabala. The age structure further amplifies this advantage: 40.31% of female respondents are aged 19–25 and 28.58% aged 26–35, cohorts associated with the greatest trainability and productivity in labour-intensive manufacturing. Male respondents are distributed more evenly across older cohorts, with 32.69% aged 26–35 and 29.07% aged 36–45, reflecting established employment and household formation patterns that concentrate men's economic activity in later working life.

Marital status further shapes the nominal supply profile: 59.29% of female respondents are single, and 37.71% are married, compared with 57.36% single and 39.82% married among men. Table 1 presents the respondents' demographic figures.

Table 1

Gender Profile of Surveyed Respondents (n = 3,864)

Indicator	Female	Male
Share of total respondents	70.63% (n=2,729)	29.37% (n=1,135)
Aged 19–25 years	40.31%	25.90%
Aged 26–35 years	28.58%	32.69%
Single (never married)	59.29%	57.36%
Married / Cohabiting	37.71%	39.82%
Widowed	0.73%	0.09%

CBT Adoption: Form Without Substance

The headline finding is that CBT adoption, measured by institutional self-report of having implemented CBT or of aligning programmes with the NTVETQF, stands at 74.19 per cent among surveyed institutions. Disaggregated by governance type, universities report the highest adoption rate at 85.71 per cent, public TVET institutions at 81.82 per cent, private for-profit institutions at 66.67 per cent, and master-craftsperson clusters at 33.33 per cent. On the surface, this suggests a training system in which the majority of providers have modernised their quality assurance frameworks in line with national policy.

The assessment data immediately complicate this picture. Practical task lists and observed assessments are used by 78.38 per cent of institutions, confirming that hands-on evaluation has become standard practice. However, simulated production-line or factory-floor assessments, which are the most direct method for evaluating whether graduates can perform under industrial conditions, are used by only 18.92 per cent of institutions. Standardised occupational safety and health modules are incorporated in 18.92 per cent. Soft-skills rubrics covering teamwork, communication, and self-management are used by 18.92 per cent. The convergence of these three figures at the same low rate is not coincidental; it reflects a consistent pattern in which CBT's formal adoption has extended to hands-on practical assessment, while its more demanding requirements, particularly those that presuppose industry engagement and factory-equivalent training environments, remain largely unimplemented.

External verification reinforces this reading. CTVET assessors are engaged by 48.65 per cent of institutions, and industry co-assessors by 18.92 per cent. A quarter of institutions (24.32 per cent) operate without any external verification. The low rate of industry co-assessment is particularly telling. In functional CBT systems, employer participation in assessment is the mechanism through which competency standards remain aligned with actual production requirements. Without it, assessment standards drift towards the training institution's evolving definition of competence rather than towards the employer's operational benchmark.

Table 2

CBT Implementation Indicators Disaggregated by Governance Type (n = 37)

Indicator	Overall	Pub. TVET	University	Private	Association
CBT or NTVETQF aligned	74.19%	81.82%	85.71%	66.67%	33.33%

Practical/observed assessment	78.38%	High	High	Moderate	Low
Simulated production assessment	18.92%	Low	Low	Low	Absent
OSH standardised modules	18.92%	Low	Low	Low	Absent
Industry co-assessors engaged (%)	18.92%	7.69%	28.57%	40.00%	0.00%
CTVET assessors engaged (%)	48.65%	61.54%	85.71%	10.00%	33.33%
No external verification (%)	24.32%	23.08%	0.00%	40.00%	33.33%

Curriculum Orientation Toward Artisanal Rather Than Industrial Production

The curriculum content documented across surveyed institutions reflects an orientation more aligned with domestic tailoring and fashion design than with export-quality industrial garment manufacturing. Public TVET institutions, the strongest governance type for garment programme coverage at 91.67 per cent, describe their programmes as dressmaking, tailoring, sewing technology, and pattern drafting. Universities frame their offerings around fashion design, textile technology, and innovation in apparel design. These descriptions reveal a curriculum logic centred on bespoke or small-batch production rather than on the standardised, high-volume, buyer-specification-driven production required by export-oriented factories.

The curriculum-industry gap is evident in the data on digital skills. The garment industry's progressive integration of computer-aided design for patternmaking, digital grading, shop-floor data management systems, and enterprise resource planning is not reflected in training provision. None of the 37 institutions offers ERP system familiarisation. CAD pattern making is covered by 27.03 per cent of institutions, digital grading by 18.92 per cent, and basic ICT skills by 37.84 per cent. Most strikingly, 37.84 per cent of institutions report offering no digital content at all. This digital deficit is especially consequential because contemporary clothing production is increasingly reorganised around Industry 4.0 applications, including CAD/CAM integration, data-enabled production control, and more continuous digital connectivity across design, planning, and manufacturing functions. Institutions that omit these capabilities risk producing graduates whose skills are misaligned with the sector's technological trajectory (Monteiro et al., 2024; Abdel-Aty & Negri, 2024). Given that modern export facilities increasingly employ digital cutting systems, computerised embroidery machines, and production-tracking dashboards, graduates trained entirely in analogue methods face an immediate technology gap upon entering the factory, regardless of their CBT certification status.

Sustainability content follows a similar pattern of selective adoption. Marker efficiency and fabric utilisation, which have direct cost implications for small enterprises, are taught by 62.16 per cent of institutions, making the sustainability dimension the most widely adopted. Energy efficiency is covered by 35.14 per cent, waste segregation and chemical handling by 27.03 per cent, and circularity or upcycling practices by 27.03 per cent. These are precisely the content areas that international buyers' compliance requirements, particularly under European sustainability directives, are increasingly making mandatory for suppliers. Their absence from most curricula represents a further dimension of curriculum-industry misalignment that current CBT frameworks have not addressed. The omission is significant because current textile and apparel production is increasingly shaped by circularity, waste reduction, resource efficiency, and sustainability compliance requirements, all of which depend on the deliberate cultivation of

green skills rather than their treatment as optional curricular add-ons (Abbate et al., 2024; Owusu-Agyeman & Aryeh-Adjei, 2024).

Instructor Deficit: Industry Experience as the Missing Variable

The effectiveness of competency-based training in producing industry-relevant graduates depends substantially on instructors' practical authority, specifically their ability to demonstrate operations at an industrial pace, troubleshoot production problems using factory-floor knowledge, and assess student performance against a calibration derived from real production environments. The instructor data reveal a consistent deficiency across governance types, though its nature varies.

Association-based and master-craftsperson institutions report an average of 1.33 full-time instructors, 0.83 certified CBT trainers, and lead trainers with an average of 1.60 years of industry experience. These figures confirm what their governance model implies: training is delivered by artisans whose expertise was formed in tailoring workshops rather than in industrial facilities, and who lack the systematic pedagogical training necessary to deliver CBT's assessment-oriented approach. Private for-profit institutions have an average industry experience of 9.50 years and 5.29 certified trainers, suggesting greater exposure to market realities. However, their extremely small instructor base, averaging 2.25 full-time staff, prevents meaningful scale.

Public TVET institutions average 7.36 years of industry experience among lead trainers and 6.83 years among certified CBT trainers, representing the strongest configuration for substantive CBT delivery. However, the nature of instructors' industry experience matters as much as its duration: experience acquired in informal tailoring enterprises, rather than in export-oriented factories, calibrates instruction to domestic production standards. The output data discussed in Section 4.5 suggest that even public TVET's strongest metrics have not produced an industrial employment pipeline adequate to garment park requirements.

Table 3

Instructor Capacity Indicators by Governance Type (Institutional Means)

Metric (institutional mean)	Public TVET	University	Private	Association
Full-time instructors	12.00	43.14	2.25	1.33
Certified CBT/CTVET trainers	6.83	318.29*	5.29	0.83
Lead trainer industry experience (yrs)	7.36	5.29	9.50	1.60
Female instructors (mean)	5.31	19.14	1.67	1.75

**Multi-departmental education faculties inflate university figures and are not directly comparable to other governance types.*

Industry Linkage: Structural Shallowness

The industry linkage data reveal widespread formal engagement with employers, yet the substantive content of those arrangements is limited. Internships with industry partners are reported by 54.05 per cent of institutions, and apprenticeship memoranda of understanding by 48.65 per cent, suggesting that a majority of institutions maintain some formal employer relationship. However, cooperative education or sandwich programmes, which represent the most substantively integrated form of work-based learning, are offered by only 10.81 per cent of institutions.

The student placement data reveal the operational reality behind these formal arrangements. Across all institutions, 21.62 per cent place no students in industry, and a further 40.54 per cent place fewer than 25 per cent of students in industry. Together, these two categories account for 62.16 per cent of institutions, meaning that roughly six in ten providers place a minority or none of their students in real production environments. The remaining 27.03 per cent report placing between 75 and 100 per cent of students, a figure concentrated among universities and mission-based institutions whose administrative structures support sustained placement coordination.

Internship duration compounds this picture. The near-equal distribution across four duration categories, with approximately 24 per cent of institutions each offering attachments shorter than four weeks, four to eight weeks, nine to twelve weeks, and longer than twelve weeks, reflects the absence of any standardised national policy on minimum industrial attachment length. An attachment shorter than four weeks provides insufficient exposure for a student to develop production-pace competency in any garment function. The absence of a minimum standard means that formal reporting of internship provision conceals enormous variation in the actual value of learning.

Graduate tracking mechanisms are similarly underdeveloped. Employer surveys to assess graduate performance are conducted by only 21.62% of institutions. Formal tracer studies, the internationally recognised standard for monitoring graduate labour market outcomes, are conducted by an identical 21.62%. Nearly 60% of institutions instead rely on informal follow-up through personal contacts and anecdotal reports, a mechanism that is too unstructured to support systematic curriculum improvement or evidence-based programme evaluation. This near-absence of feedback loops between graduate employment outcomes and curriculum content is the institutional mechanism through which curriculum-industry misalignment reproduces itself across successive graduate cohorts. Recent Ghanaian tracer-study research similarly underscores that systematic graduate tracking is not merely a monitoring exercise but a core mechanism for identifying employability constraints, calibrating programme relevance, and strengthening the evidence base for institutional reform (Ababio et al., 2024).

Financing Fragility and Its Systemic Consequences

The financing structure of the TVET system functions as a structural driver of institutional misalignment rather than merely a resource constraint. Of the 37 surveyed institutions, 64.86 per cent depend primarily on trainee fees for revenue. Government subvention reaches only 27.03 per cent of institutions. Donor project funding supports 2.70 per cent, and no institution receives corporate social responsibility contributions. This fee-dependent model has consequences for training quality and equity that compound over time across institutions.

Institutions reliant on trainee fees cannot invest in the capital equipment and facility upgrades required for industrial-standard training without either raising fees to levels that exclude low-income learners or accepting a permanent equipment deficit. The data confirm that this constraint is binding: 78.38 per cent of institutions report equipment constraints, making it the single most pervasive operational limitation across the survey. As a result, institutions train students on equipment that does not replicate factory conditions. Tailoring machines used in training differ in specifications, age, and industrial configuration from those students will encounter on a production floor, ensuring that even students who develop competence on training equipment must undergo a second learning process at the point of employment.

Financing fragility also shapes institutional responses to reform. An institution dependent on tuition revenue for operational continuity faces a powerful incentive to maintain programme content and delivery models that attract fee-paying students in the current market, which is oriented toward domestic tailoring and fashion design rather than toward industrial employment. CBT reform documents can be produced

and submitted to CTVET at minimal marginal cost without disrupting this market-oriented pedagogy. The result is precisely the decoupling between formal adoption and substantive implementation that institutional theory predicts.

Graduate Outcomes: The Bottom-Line Evidence of Misalignment

The graduate outcome data provide the most direct evidence of the misalignment's practical consequences. Among public TVET institutions, the strongest performers on most quality indicators have an average formal placement rate of 20.70 per cent in garment factory employment. Universities achieve 16.29 per cent. Private institutions reach 6.56 per cent, and association-based institutions 1.00 per cent. In contrast, self-employment rates are 43.55 per cent for public TVETs and 66.29 per cent for universities, confirming that the dominant graduate destination across all governance types is the informal tailoring and fashion design sector.

These figures must be read against the backdrop of graduate volume data. Public TVET institutions produce an average of 65.92 garment-related graduates per year, while universities produce 149.71. At a 20.70 per cent factory placement rate for the best-performing type, public TVETs place approximately 13.6 graduates per institution per year into formal garment employment. Against the projected employment demand of hundreds or thousands of workers for a functioning industrial park, this pipeline is substantially insufficient, and the gap will not be closed by CBT documentation reforms that leave the underlying pedagogical model, equipment base, and industry linkage structures unchanged. This aligns with broader evidence from across Africa showing that improved enrolment and qualification completion do not automatically translate into equitable or robust labour market outcomes, particularly when transition mechanisms from training to employment remain weak and unevenly structured (Friderichs et al., 2024).

Table 4

Graduate Output and Labour Market Transition by Governance Type (Institutional Means)

Metric	Public TVET	University	Private	Association
Avg. graduates per year	65.92	149.71	3.70	5.00
Placed in formal factory employment	20.70%	16.29%	6.56%	1.00%
Entering self-employment	43.55%	66.29%	3.44%	3.50%
Tracer studies conducted	15.38%	71.43%	10.00%	0.00%
Employer surveys conducted	7.69%	28.57%	40.00%	16.67%

The TVET Alignment Diagnostic Tool

The TVET Alignment Diagnostic Tool offers a structured approach to assessing the extent to which a TVET institution's operational practices align with the competency requirements of a specified industrial sector. Drawing on the survey's six thematic domains and calibrated against the ILO garment sector competency framework and international benchmarks from comparable industrial park TVET systems, the TADT scores institutions on a three-point rubric for each of six alignment dimensions. A score of 0 indicates the absence of the relevant practice, 1 indicates partial implementation with significant gaps, and 2 indicates substantive implementation that meets or approaches industry-grade standards. The maximum possible Alignment Index is therefore 12, representing full alignment across all six dimensions.

Table 5

TVET Alignment Diagnostic Tool: Dimensions, Scoring Criteria, and Governance-Type Scores

Dimension	Substantive Standard (Score = 2)	Pub. TVET	University	Private	Association
1. Curriculum Alignment	Industrial garment content incl. digital tools, quality protocols, buyer specifications	1	1	0-1	0
2. Pedagogical Alignment	Simulated production assessment, OSH modules, soft-skills rubrics systematically applied	1	1	0-1	0
3. Infrastructure Alignment	Industrial-specification machines, digital equipment, factory-equivalent facilities	1	1	0	0
4. Instructor Alignment	Majority of instructors with verifiable experience in export-grade garment production	1	0-1	1	0
5. Industry Linkage Alignment	Majority of students in structured placements of 12 or more weeks; tracer studies conducted	1	1	0	0
6. Financing Alignment	Diversified, sustainable funding mix; training costs accessible to low-income learners	1	1	0	0
TOTAL ALIGNMENT INDEX (max 12)		**6/12**	**5-6/12**	**1-3/12**	**0-1/12**

The Alignment Index scores show that no governance type meets the substantive alignment threshold for meaningful industrial readiness. Public TVET institutions, scoring approximately 6 out of 12, achieve partial alignment across all six dimensions but full alignment on none. Universities score comparably on curriculum, pedagogy, and industry linkage but show deficits in instructor experience relative to factory-floor requirements. Private for-profit institutions score only one to three points, primarily on instructor experience, while their infrastructure, curriculum, placement, and financing deficits remain severe. Association-based and master-craftsperson institutions score at or near zero on nearly all dimensions, confirming their fundamental unsuitability for industrial garment training without comprehensive structural intervention.

The diagnostic value of the TADT lies not in absolute scores, but in the dimensional profile it reveals. The bottleneck for Public TVETs is primarily infrastructure and the lack of industrial-scale digital tools, compounded by weak industry linkages at the placement level. The bottleneck for universities is instructor experience and the self-employment orientation of their curriculum logic. The bottleneck for private institutions is scale, infrastructure, and financing. Association-based institutions require wholesale restructuring before they can contribute to an industrial garment training pipeline. Each diagnostic profile

points to a distinct intervention strategy, making the TADT a differentiated planning tool rather than a simple ranking mechanism.

Discussion

The evidence presented in this paper supports the interpretation, grounded in institutional theory, that Ghana's garment-sector TVET system exemplifies ceremonial CBT adoption: a pattern in which the formal markers of competency-based reform are implemented to secure regulatory legitimacy while the substantive pedagogical, infrastructural, and governance conditions necessary for industrial competency formation remain unchanged. This is not primarily a story of institutional bad faith; it is a story of institutional logic. When the incentive system rewards accreditation compliance rather than industrial employment outcomes, when funding structures do not provide the capital for equipment investment, and when employer demand for the training system is too thin and fragmented to generate accountability pressure, rational institutional actors produce exactly the pattern observed.

The skills ecosystem framework adds a systemic dimension to this institutional explanation. The garment sector's training-production ecosystem in the Volta Region is locked in what Finegold (1999) would characterise as a low-skill equilibrium, reinforced from multiple directions. The absence of a large export-oriented employer base means that demand for industrial-grade graduates is weak, so training institutions face no market pressure to produce them. As a result, graduates are trained for informal tailoring markets, leaving the talent pool available to potential investors inadequate. This, in turn, makes the region unattractive to investors seeking high-skill operations, perpetuating the absence of the demand that would otherwise drive reform. Breaking this equilibrium requires simultaneous intervention across multiple parts of the ecosystem, not a single-institution training reform.

The political economy dimension warrants explicit attention. CBT's adoption in Ghana was promoted through donor-funded technical assistance conditioned on framework documentation rather than on substantive outcome metrics. This created a predictable incentive for form-over-substance compliance. The lesson for future reform programming is that conditionality should target outcomes, specifically formal employment placement rates, industry co-assessment coverage, and equipment standards, rather than process compliance with framework documentation. Outcome-based conditionality creates institutional incentives aligned with substantive implementation rather than with ceremonial adoption.

The TADT contributes to sectoral skills planning methodology by providing a transferable diagnostic framework whose six dimensions align with key institutional preconditions for the effective functioning of the skills ecosystem, as identified in the comparative literature. Applied systematically across TVET providers serving a planned industrial cluster, the tool generates a differentiated institutional map from which sector-specific intervention strategies can be designed. Its application to the Ghanaian garment sector suggests that such mapping should be a standard component of industrial park feasibility analysis, conducted before investment commitments are made rather than after skills deficits become operational constraints.

Policy Implications and Recommendations

The analysis supports a public-private co-governance model for TVET reform, in which employers are not merely consulted on curriculum design but are structurally positioned as co-governors of programme standards, co-assessors of graduate competency, and co-investors in training infrastructure. Four specific recommendations follow from the diagnostic evidence.

The first recommendation is to establish outcome-based accreditation standards that supplement Ghana's current process-compliance framework with industrial employment metrics. CTVET should

require all institutions seeking garment-sector accreditation to report annual data on the proportion of graduates placed in formal industrial employment, disaggregated by employer and industry type. Accreditation renewal should be conditional on meeting minimum thresholds for these metrics, initially set to challenge current practice without being immediately unachievable. This single reform would fundamentally alter the institutional incentive structure, making substantive implementation the only viable path to continued accreditation.

The second recommendation is to establish a shared garment training infrastructure hub, co-located with or adjacent to the Volta Region industrial park, equipped to factory specifications and jointly managed by the park management authority, CTVET, and a consortium of TVET institutions. This model directly addresses the equipment deficit documented for 78.38 per cent of institutions, a deficit that no single institution can resolve through its own financing. Shared infrastructure reduces the per-institution capital burden while ensuring that all participating institutions' students train on equipment calibrated to the actual production environment. The Ethiopian Hawassa Industrial Park pre-employment training hub offers a directly applicable precedent.

The third recommendation is to make industry co-assessment a condition of CTVET certification for all garment-related programmes. The current 18.92 per cent industry co-assessor engagement rate reflects voluntary adoption; making it mandatory would enforce the feedback loop between employer expectations and training quality standards. Co-assessment processes should be structured around the ILO garment sector competency framework, providing a consistent reference point that prevents individual employers from customising standards to idiosyncratic specifications while ensuring assessments remain calibrated to production realities.

The fourth recommendation is to redirect donor financing from CBT framework documentation to outcome-linked subsidies for training delivery. A training fund modelled on outcome-based financing principles, releasing tranches of institutional support upon verified achievement of graduate placement targets, would align external resource flows with substantive implementation rather than procedural compliance. Recent evidence suggests that skills interventions are more likely to improve employment outcomes when they are sufficiently high quality, aligned with market demand, and supported by funding arrangements that reward responsiveness and measurable results rather than procedural compliance alone (Beber et al., 2025; Mack, 2024).

Conclusion

This paper has argued that Ghana's garment-sector TVET system exhibits a structural decoupling between the formal adoption of Competency-Based Training and its substantive implementation. Evidence from 37 TVET institutions across the Volta Region industrial corridor shows that CBT's procedural markers have been widely adopted. At the same time, the institutional practices that give CBT its competency-forming potential, including simulated production assessment, industry co-assessment, factory-specification equipment, instructors with export-factory experience, and functional graduate tracking, remain the exception rather than the rule. Together, institutional theory, skills ecosystem frameworks, and the political economy of CBT reform in Sub-Saharan Africa explain why this pattern has emerged and why it is self-reinforcing.

The TVET Alignment Diagnostic Tool developed here provides a methodology for making this decoupling measurable, differentiated by governance type, and actionable for policy design. Its application to the Ghanaian case yields an Alignment Index showing that no governance type approaches substantive industrial alignment, with public TVETs performing best at approximately half the maximum score. The proposed policy architecture, comprising outcome-based accreditation, shared infrastructure, mandated industry co-assessment, and outcome-linked financing, addresses the institutional mechanisms sustaining

the decoupling rather than adding further procedural layers to a system already characterised by an excess of form over substance.

The transferability of these findings and tools to other Sub-Saharan African economies pursuing garment-sector development under the AfCFTA framework is high. The structural conditions observed in Ghana, including thin employer demand, fee-dependent TVET financing, artisanal training traditions, and donor-driven CBT adoption, are shared across multiple contexts where comparable reform failures have been documented. The TADT provides a common diagnostic language for systematically identifying and addressing these conditions, contributing a transferable methodology to the comparative and international education literature on skills development for industrialisation.

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Conflict of Interest

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