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BRIDGING INDUSTRY AND EDUCATION: ENHANCING TVET CURRICULUM DELIVERY FOR TRADE POLICY IMPLEMENTATION IN NIGERIA

[*1]Korter Grace Oluwatoyin, [2]Lawal Praise Olamide, [3]Korter King Olumakinde, [4]Korter Richman Oluwadamilola

[1]Department of Statistics, Federal Polytechnic Offa, Nigeria.

[2]Department of Mathematics & Statistics, Kwara State University, Malete, Nigeria.

[3]Department of Computer Engineering, Federal University of Technology, Minna, Nigeria.

[4]Department of Electrical Electronics Engineering, Federal University of Technology, Minna, Nigeria.

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***Corresponding Author: Korter Grace Oluwatoyin**
Department of Statistics, Federal Polytechnic Offa, Nigeria.

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ABSTRACT

Nigeria's Technical and Vocational Education and Training (TVET) system holds considerable potential to drive sustainable economic growth, yet its impact is diminished by persistent gaps between academic instruction and evolving industry demands. This study examines the effectiveness of curriculum delivery in relation to industrial engagement among TVET lecturers in Nigeria. Using a sample of 69 lecturers, two key indicators of industrial interaction were measured: B1, a binary variable indicating direct industrial engagement, and B3, a scale assessing the frequency of engagement with industry partners. The outcome variable, C1, reflects the frequency with which lecturers incorporate industry-relevant case studies into their teaching, measured on an ordinal scale. Ordered logistic regression (OLR) was employed to analyze the ordinal outcome, and odds ratios were computed to interpret the effects of the predictors. The findings reveal that lecturers with direct industrial engagement (B1) are significantly more likely to enrich their curriculum with practical industry examples (Odds Ratio = 2.83, $p < 0.05$). In contrast, the frequency of industry engagements (B3) did not significantly affect curriculum delivery. These results underscore that it is not merely the frequency but the quality of industrial involvement that enhances the relevance of TVET curricula. This study provides empirical evidence that reinforces calls for robust industry-academia partnerships and curriculum reform in TVET. The implications of these findings are

far-reaching; policymakers and educators are encouraged to promote direct industrial collaboration and invest in professional development. Such initiatives are essential for aligning TVET outputs with real-world industrial needs, thereby improving workforce readiness and contributing to national economic development**.**

KEYWORDS: TVET; Industry Engagement; Curriculum Delivery; Economic Growth; Nigeria.

INTRODUCTION

Nigeria's Technical and Vocational Education and Training (TVET) system is widely acknowledged as a pivotal instrument in driving national development and economic transformation. Despite its potential to produce a highly skilled workforce, significant gaps persist between the theoretical delivery of TVET curricula and the practical requirements of the industry. Many TVET institutions still rely on curricula that have evolved from colonial educational models, which do not fully capture the dynamic challenges and technological advancements needed in today's industrial sector. This dissonance is rooted in historical practices, where curricula developed under colonial influence leaned heavily towards theoretical instruction rather than practical, market-driven competencies (Owolabi, 2003). As a result, many TVET institutions continue to deliver content that falls short of meeting contemporary industry needs, contributing to issues such as high graduate unemployment and suboptimal productivity (Alabi et al., 2014; Akhuemonkhan & Raimi, 2013). Such misalignments contribute to inefficiencies in workforce preparation and are thought to underlie issues of high graduate unemployment and suboptimal industrial productivity.

Recent scholarship has emphasized that robust industry–academia partnerships are essential to invigorate TVET curricula with contemporary, industry-relevant content. For example, Korter, Lawal, and Korter (2025) demonstrate that active industrial engagement substantially enhances the incorporation of practical case studies and examples within academic settings. Likewise, Okorafor, Uduanochie, and Achukwu (2014) advocate for sustainable mechanisms that bring industry practitioners into the curriculum development process, arguing that the infusion of real-world perspectives is critical for forging graduates who are adequately prepared for the rapidly evolving global market.

Against this backdrop, the primary objective of the present study is to evaluate the effectiveness of curriculum delivery in relation to industrial engagement among TVET lecturers in Nigeria. Specifically, the research investigates whether direct industrial engagement (as captured by a

binary measure) and the frequency of such engagements significantly influence the incorporation of industry-relevant case studies into the teaching process. To achieve this, the study employs ordered logistic regression (OLR) and interprets the resulting odds ratios, thereby providing a robust statistical framework for assessing the impact of industrial engagement on pedagogical practices.

The significance of this study lies in its potential to inform policy and practice. First, by establishing empirical links between industrial engagement and classroom practices, the findings offer a compelling argument for closer partnerships between TVET institutions and industry. Second, the study contributes to the body of literature that advocates for curriculum reform tailored to local economic conditions and technological advancements. This study contributes to the broader discourse on educational reform in developing economies. Also, these insights can guide policymakers in designing targeted interventions for sustainable economic growth and development by ensuring that TVET graduates possess competencies that are directly aligned with contemporary industrial needs. Ultimately, it underscores the necessity for TVET institutions to foster deeper, more meaningful partnerships with industry to enhance workforce readiness and, in turn, drive sustainable economic growth.

The remainder of this paper is organized into the following sections: Section 2: Literature Review, Section 3: Methods, Section 4: Results and Discussion and Section 5: Conclusion and Recommendations

LITERATURE REVIEW

The development of Technical, Vocational Education and Training (TVET) in Nigeria is rooted in the country's rich indigenous apprenticeship systems that were later transformed under colonial influence. Pre-colonial educational practices focused on hands-on skill acquisition for everyday survival and local craftsmanship, yet with the advent of Western education, Nigeria's system shifted toward academic subjects that often-undervalued practical vocational training (Owolabi, 2003). Mkpa (2014) notes that this evolution resulted in curricula that are heavily influenced by foreign models, a legacy that contributes significantly to current challenges in aligning TVET with indigenous industrial needs and trade imperatives.

A recurring theme in the literature is that the TVET curricula in Nigeria have not kept pace with the rapidly changing demands of the modern industrial landscape. Eze and Okorafor (2012) argue that the existing curricula are overly theoretical and draw heavily on models that do not consider local resources, cultural practices, or market demands. Similarly, Ojimba (2012) and Olunloyo (2002) emphasize the urgent need for curriculum reform that shifts focus

from imported paradigms to indigenous frameworks, ones that integrate both technical competencies and soft skills essential for participation in global trade. Okorafor, Uduanochie, & Achukwu (2014) suggests that fostering closer school–industry linkages is critical. Such partnerships can facilitate the incorporation of current industrial practices and ensure that training programs produce graduates who are immediately relevant to local industry and, by extension, supportive of national trade policies.

The effective delivery of an industrially relevant TVET curriculum faces numerous challenges. Structural issues such as chronic underfunding, outdated infrastructural facilities, and a shortage of qualified instructors impede the ability of TVET institutions to provide quality education (Nwogu & Nweanomo, 2011; Okoye & Arimonu, 2016). Furthermore, the lack of continuous professional development for TVET teachers limits their capacity to adopt innovative and industry-oriented teaching practices. Ibeneme (2013) highlights that without the necessary skills, educators struggle to integrate new technologies and pedagogical methods that mirror real-world industrial demands. These challenges not only weaken the effectiveness of TVET programs but also constrain Nigeria's ability to craft a skilled workforce, an essential ingredient for the successful implementation of trade policy and for enhancing the country's global economic competitiveness.

In response to these challenges, scholars and practitioners recommend several strategies to reform TVET curricula and practices. Central to these recommendations is the need for indigenous curriculum development that reflects local economic conditions and leveragesnative technological and cultural assets (Eze & Okorafor, 2012; Olunloyo, 2002). Strengthening school–industry collaboration is frequently cited as a means to facilitate real-world training and to keep curricula aligned with both current and emerging industrial trends (Okorafor et al., 2014). Additionally, increasing government investment and expanding training infrastructure are seen as policy imperatives that would enable TVET institutions to modernize their teaching environments, enhance teacher capacity, and integrate advanced ICT tools into learning processes (Afeti, 2006). Collectively, these reforms are positioned to produce a competent workforce that can drive industrial modernization while supporting trade policies designed to foster economic growth and self reliance.

Korter et al. (2025) addresses a persistent challenge in Nigeria's educational landscape: the disconnect between Technical and Vocational Education and Training (TVET) programs and the needs of the industry. The authors contextualize the study within the broader framework of economic development theory and human capital formation. Historically, TVET in Nigeria has been burdened by outdated curricula and an insular academic culture that does not reflect

contemporary industrial practices. This disconnects, as noted by Korter et al. (2025), contributes to low productivity levels and hampers economic growth. The article builds on earlier works that stress the importance of industry-academia linkages (Akhuemonkhan & Raimi, 2013; Alabi et al., 2014) and reaffirms that sustainable development in Nigeria depends on revamping TVET to meet the demands of a modernized economy.

Korter et al. (2025) employ a mixed-methods approach that combines quantitative surveys with qualitative interviews. The quantitative strand gathers perceptions from TVET faculty and students on curriculum relevance, while the qualitative component involves in-depth interviews with industry stakeholders. This dual approach allows the researchers to identify not only the statistical magnitude of the skill gap but also to capture nuanced perspectives regarding the barriers to effective school–industry collaboration. Through this methodology, the authors were able to triangulate their findings and offer robust recommendations aimed at enhancing industry relevance in TVET curricula.

The findings reveal a significant misalignment between academic training and current industrial requirements. Notably, respondents pointed to outdated course content, inadequate practical training facilities, and a limited presence of industry experts within TVET institutions (Korter et al., 2025). The study underscores that the implementation of school–industry partnerships such as internship programs, guest lectures by industry veteran professionals, and collaborative curriculum development can substantially reduce these gaps. The article identifies several best practices from international contexts and suggests that tailored policy interventions (including increased government funding and incentives for private-sector collaboration) are essential for fostering a more responsive TVET system.

In discussing the implications of their findings, Korter et al. (2025) advocate for the integration of industry input into all stages of curriculum development. They argue that such integration would not only improve the morale and efficacy of TVET instructors but also reshape the post-educational trajectories of graduates, ultimately leading to better job placement rates and enhanced economic productivity. The paper also highlights the need to shift public perceptions regarding vocational education; by elevating the status of TVET, policymakers can attract a broader pool of talent and stimulate entrepreneurial endeavours. These recommendations echo similar calls in the literature (Alabi et al., 2014; Akhuemonkhan & Raimi, 2013) for a systemic overhaul as a pathway to economic development and national growth.

Nwoye, Bassey, Omale, and Nengak (2024) explore how stronger partnerships between Technical and Vocational Education and Training (TVET) institutions and industries can contribute to narrowing the skill gap that hampers sustainable national growth in Nigeria.

Recognizing that youth unemployment and underemployment partly stem from a mismatch between theoretical instruction and the practical demands of industries. Agomuo (2017) and Ejiofor & Ali (2015) adopt a descriptive survey design to examine views from both TVET administrators/experts and industrial stakeholders in Enugu State. Using a researcher-developed questionnaire based on a five-point Likert scale, the study sampled 139 respondents. The findings reveal that TVET-industrial collaboration has a multifaceted impact. For instance, respondents agreed that collaborative efforts lead to the exchange of technical know-how, enhancement of TVET curricula, improved provision of infrastructure, and facilitation of research and industrial attachment programs. These impacts, as the authors note, are aligned with previous literature that highlights the benefits brought about by robust industry–academia partnerships. Okoye & Okwelle (2013) and Osman et al. (2011) also identifies several benefits of such collaborations: improved operational efficiency in TVET, enhanced apprenticeship opportunities, and cost savings in retraining industrial workers, all of which contribute to producing a workforce that meets industry standards. Moreover, the study discusses strategic interventions, including building trust through regular consultations, establishing formal Memoranda of Understanding (MoU's), and linking hiring/promotion policies to industry-related activities as key enablers for effective partnerships.

Reinforcing linkages between TVET institutions and industry is critical for addressing skill mismatches and ensuring that graduates possess the practical competencies required for sustainable economic development. Their recommendations call for policy reforms that encourage active collaboration, increased funding, and infrastructural support for TVET programmes. Bello and Muhammad (2021) offers a broad and in-depth analysis of Nigeria's TVET landscape. The authors present a historical overview of TVET from its pre-colonial apprenticeship roots to the formalized structures introduced during the colonial era and subsequently reformed after independence. This historical perspective helps explain the persistent negative societal perceptions of TVET, where technical education is seen as secondary compared to university education (Bello & Muhammad, 2021; Kilby, 1964; Okoye & Okwelle, 2013).

Bello and Muhammad (2021) delineates the multifaceted structure of the Nigerian TVET sector, detailing its integration into the national education system from primary, post-basic, to tertiary levels, and describing the roles of technical colleges, polytechnics, vocational enterprise institutions, and the emerging Nigerian Skills Qualification Framework (NSQF). The authors emphasize that although TVET is a recognized tool for manpower development and sustainable national growth, the sector continues to suffer from chronic challenges. Among

the key issues highlighted are poor societal perceptions, inadequate funding, governance failures including corruption and unqualified managerial appointments, and severe manpower shortages. The authors point out that these challenges lead to a mismatch between the skills produced by TVET institutions and the demands of the labor market (Bello & Muhammad, 2021; Zite & Deebom, 2017; Ogbunaya & Udoudo, 2015). Additionally, Leney (2014) and Ogwo & Ezekoye (2020) discuss policy and implementation shortcomings, such as incoherent policy frameworks and weak coordination among government agencies, which further undermine the sector's potential

In response, Bello and Muhammad (2021) propose an extensive array of repositioning strategies. These include increased and diversified financing for TVET, curriculum reforms that are closely aligned with labor market needs, better partnerships between TVET institutions and industries, the promotion of hybrid learning models (such as dual education systems), and strengthening both internal and external quality assurance mechanisms. They also stress the importance of addressing gender disparities and harnessing the potential of the informal and non-formal TVET sectors. They document enduring challenges and provide a set of practical recommendations that, if implemented, could transform Nigeria's TVET sector into a robust engine for economic development and social cohesion.

METHODS

Study Design and Variables

In this study, we sought to explore how industrial engagement relates to the effectiveness of TVET curriculum delivery. Respondents (TVET lecturers) provided ordinal responses to items that capture both industrial engagement and curriculum delivery practices. The industrial engagement measures include:

B1: "Are you currently involved in any industrial engagement activities?" B3: "How often do you engage with industry partners?"

Curriculum delivery and industry relevance were measured by the following ordinal items:

C1: "How often do you incorporate industry relevant examples/case studies into your teaching?"

C2: "Do you involve partners in curriculum development review?"

C3: "How important is industry feedback in shaping your curriculum?"

Each response was recorded on a Likert-type scale (e.g., 1 = "Never" up to 5 = "Always" or "Not important" to "Very important"), which rendered the outcome variables inherently ordinal.

Instrumentation/Measurement Reliability

A self-developed questionnaire was used to collect data on TVET lecturers' perceptions of curriculum delivery and industrial engagement. The instrument was constructed based on anextensive review of relevant literature and was designed to capture key constructs using multiple items. To ensure content validity, the draft questionnaire was reviewed by five subject matter experts in the fields of TVET and industrial training. Their feedback was incorporated, resulting in a refined instrument that clearly defined each variable under investigation.

Prior to the full-scale survey, a pilot study was conducted with a small subset of the target population to assess the instrument's reliability. Cronbach's alpha was calculated to determine the internal consistency of the items. The pilot testing yielded a Cronbach's alpha coefficient of 0.83, which exceeds the generally accepted threshold of 0.70 for adequate reliability. This coefficient indicates that the items have strong internal consistency and that the instrument is a dependable measure of the constructs of interest. These reliability measures support the decision to employ the survey tool in the main study despite the inherent challenges of data collection in our context.

Data Collection and Sample Justification

While many of the studies in our field report surveys with larger sample sizes, it is not uncommon for research focusing on specific professional groups such as TVET lecturers, especially in contexts with infrastructural challenges (e.g., inconsistent internet access and frequent power outages) to yield relatively small sample sizes. Although, a direct comparison is challenging because many of the referenced studies do not explicitly report a sample size as low as 69, studies conducted in similar environments within Nigeria have encountered comparable limitations. For instance, research on TVET issues in resource-constrained contexts by authors such as Okwelle, Deebom, Harcourt, & Okwelle (2017) and Okoye and Okwelle (2013) sometimes reveals that accessing highly specific or hard-to-reach populations (e.g., TVET academic staff) can result in modest sample sizes. Similarly, several studies on technical and vocational education in Nigeria have noted challenges that naturally restrict the respondent pool (e.g., Akhuemonkhan & Raimi, 2013; Ojimba, 2012).

Moreover, given the documented challenges in the Nigerian context, such as unreliable Internet connectivity and erratic electricity supply (as highlighted in Achuama, 2024), a sample size of 69 is justifiable and does not automatically detract from the reliability of the findings. The internal consistency of our survey instrument (Cronbach's alpha = 0.83) and the focused nature of our target population (TVET lecturers) further support the validity of the results. Therefore,

while our sample size might appear modest compared to surveys of broader populations, it is consistent with, and indeed a reflection of the real-world constraints encountered in similar studies conducted in Nigeria.

Statistical Analysis

Given the ordinal nature of the response variables (C1, C2, and C3), we employed Ordered Logistic Regression (OLR), also known as the ordered logit model to evaluate the effect of industrial engagement on curriculum delivery practices. This model is particularly appropriate when the dependent variable is ordinal and when the proportional odds (or parallel lines) assumption is met.

For each curriculum indicator (e.g., C1, C2, or C3), the general specification for the ordered logistic regression model is as follows:

$\text{logit}\,[P(Y \geq j)] = \alpha j - \beta 1 X1 - \beta 2 X2$ for $j = 1,2,\ldots,J-1$ where:

$\text{logit}\,[P(Y \geq j)]$: This is the log-odds of the probability that the outcome Y is at least category j. It transforms probabilities into a form suitable for linear modelling.

Y is the ordinal outcome variable (e.g., frequency of incorporating industry examples in teaching for C1).

j denotes the threshold between ordinal response categories.

αj represents the cutpoint (threshold parameter) for the jth category.

$X1$ and $X2$ are predictor variables representing industrial engagement strategies derived from responses to B1 and B3.

$\beta 1$ and $\beta 2$ are the coefficients that indicate the effect size of each predictor.

In this formulation, the model expresses the log odds that a respondent's score on a given curriculum delivery indicator is in a higher category versus all lower categories.

Assumptions and Model Diagnostics

Several rules and assumptions underpin the validity of the ordered logistic regression model:

1. Ordinality of the Outcome: The dependent variable must have a natural order. In our study, responses such as frequency of use or perceived importance are ordered by design.
2. Proportional Odds/Parallel Lines Assumption: The relationship between each pair of outcome groups is assumed to be consistent. This assumption implies that the coefficients that describe the relationship between predictor variables and the odds of being in a higher versus a lower category are the same regardless of the threshold. We tested this assumption by using procedures such as the Brant test.

3. No Perfect Multicollinearity: The independent variables (industrial engagement measures) should not be perfectly correlated. Prior to running the model, correlation analyses and diagnostics were conducted to ensure that multicollinearity was not an issue.
4. Adequate Sample Size: For reliable estimation, the sample size must be sufficient to support the number of predictors included in the model.
5. Interpretation via Odds Ratio: The coefficients (β) obtained from the model are exponentiated to yield odds ratios (OR). For example, an odds ratio greater than 1 Indicates that a one-unit increase in the predictor variable is associated with higher odds of being in a higher category of the curriculum variable. Conversely, an odds ratio less than 1 indicates reduced odds.

Estimation and Software

The ordered logistic regression analyses, along with the computation of corresponding odds ratios and confidence intervals, were performed using statistical software. Significance levels were set at $p < 0.05$, and model fit was assessed via pseudo-R^2 values and likelihood ratio tests. By applying the ordered logistic regression model, this study quantitatively assessed how variations in industrial engagement (as measured by B1 and B3) influence key curricular practices (C1, C2, and C3). The use of odds ratios facilitates straightforward interpretation; specifically, it allows for quantifying how likely it is that higher levels of industrial engagement are associated with more effective curriculum delivery practices.

RESULTS AND DISCUSSION

Data Summary Overview

B1 (Current Industrial Engagement):

This variable is binary (0 or 1). The summary indicates that the median is 1 and the mean is 0.5652, suggesting that over half of the respondents report some level of industrial engagement.

B3 (Frequency of Engaging with Industry Partners):

Measured on a scale from 1 to 6, the median is 4 with a mean of 3.58. This distribution indicates a moderate level of engagement with industry partners among respondents.

C1 (Frequency of Incorporating Industry Relevant Examples/Case Studies):

Measured on an ordinal scale from 1 (Never) to 5 (Always), the median is 4 and the mean is 3.899. This implies that, overall, lecturers are incorporating industry examples in their teaching at a relatively high frequency.

Reliability Analysis

The reliability analysis of the survey instrument was performed on the data collected from the 69 TVET lecturers. The calculated Cronbach's alpha coefficient was 0.83, reflecting good internal consistency among the items across the various scales. This result confirms that the instrument reliably measured the constructs of TVET curriculum delivery and industrial engagement. A Cronbach's alpha value above 0.70 is widely considered acceptable for research purposes (Nunnally, 1978), and our value of 0.83 strongly supports the dependability of the instrument. Hence, despite the modest sample size, attributable to challenges such as inconsistent internet connectivity and intermittent electricity supply, the reliability of our measures provides a solid foundation for the subsequent analysis and interpretation of the study's findings.

Ordered Logistic Regression Model

Model Specification: The ordered logit model was specified as:

$C1 \sim B1 + B3$

where C1 is the ordinal outcome representing the frequency of teaching with industry-relevant case studies, and B1 and B3 are the predictors.

Regression Coefficients and Their Interpretation: B1 (Current Industrial Engagement):

Coefficient: 1.04090

Standard Error: 0.4796

t-value: 2.1703

Odds Ratio: exp (1.04090) ≈ 2.83

A one-unit increase in B1 (i.e., being engaged in industrial activities versus not being engaged) is associated with 2.83 times higher odds of scoring in a higher category for incorporating industry-relevant case studies into teaching. In practical terms, lecturers who are currently engaged in industrial activities are nearly three times as likely to incorporate these case studies compared to those who are not holding the frequency of engaging with industry partners (B3) constant.

B3 (Frequency of Engaging with Industry Partners): Coefficient: 0.01699

Standard Error: 0.1026

t-value: 0.1657

Odds Ratio: exp (0.01699) ≈ 1.017

The coefficient for B3 is very small and not statistically significant (t = 0.1657). This indicates that an increase of one unit on the frequency scale of engaging with industry partners (B3)

results in only about a 1.7% increase in the odds of a higher response category for C1, which is negligible. In other words, once individual industrial engagement (B1) is accounted for, the frequency of engaging with industry partners does not significantly predict the likelihood of incorporating industry relevant examples into teaching.

Threshold Coefficients (Cutpoints): These represent the latent variable's cutoff points between the ordinal categories of C1:

Never|Rarely: –2.0068

Rarely|Occasionally: –1.0849

Occasionally|Often: –0.1269

Often|Always: 0.8941

Although these thresholds are less interpretable conceptually, they indicate how respondents' latent propensity (or underlying continuous measure) for incorporating industry examples is segmented into the observed ordered responses.

Model Fit

Log Likelihood: –93.41

Residual Deviance: 186.81

AIC: 198.81

While these metrics provide an indication of fit, the primary focus here is on the significance and magnitude of the predictors.

Industrial Engagement (B1) is a key and significant predictor: Lecturers who are currently engaged in industrial activities (B1 = 1) have significantly higher odds (approximately 2.83 times higher) of frequently incorporating industry-relevant case studies in their teaching. This underscores that direct industrial involvement positively influences how effectively lecturers bring in practical, industry-related content into the vocational curriculum.

Frequency of Engagement with Industry Partners (B3) does not add significant predictive power: Despite being a measure of how often lecturers engage with industry, B3 does not significantly influence the teaching practice (as indicated by its near-zero coefficient and odds ratio close to 1). This suggests that it is not the frequency per se, but rather the act of being engaged at all (as captured by B1) that makes the difference.

The results are consistent with the argument that direct industrial engagement is crucial to improving the practical relevance of TVET pedagogy. As found in Korter et al. (2025), a strong link between academic staff and industry partners ensures that teaching practices are aligned with real-world requirements. In our study, the significant effect of B1 (with an odds ratio of

approximately 2.83) echoes the findings of scholars like Alabi et al. (2014), who contend that active involvement in industrial activities fosters richer, more relevant curriculum content. This suggests that when lecturers are directly engaged with the industry, they are more likely to incorporate pragmatic examples and case studies into their courses, effectively bridging the gap between theory and practice.

On the other hand, the frequency of engagements with industry partners (B3) did not significantly predict curricular enhancements, which aligns with observations by Okorafor et al. (2014). These authors argue that it is not merely the number of interactions that matters, but the quality and depth of these engagements. Our analysis implies that a simple increase in contact frequency-absent substantive, direct industrial involvement may not have a transformative effect on curriculum delivery.

Moreover, these findings support the broader thematic literature emphasizing the need for educational reforms that integrate industry input into TVET curricula (Akhuemonkhan & Raimi, 2013). Such integration is vital for equipping graduates with the skills necessary for economic development and ensuring that TVET institutions contribute effectively to national growth.

In summary, the evidence from the ordered logistic regression highlights that:

1. Direct Industrial Engagement (B1) is a significant predictor of teaching practices that reflect industry relevance.
2. Frequency of Engagement (B3), as an isolated metric, does not sufficiently drive curricular improvements.

These insights suggest that policy initiatives should prioritize strengthening meaningful partnerships between TVET institutions and industry, thereby ensuring that educators are not only in contact with industry but are deeply embedded in its practices and challenges.

CONCLUSION AND RECOMMENDATIONS

This study set out to investigate the effectiveness of TVET curriculum delivery through the lens of industrial engagement among Nigerian lecturers. The analysis, based on ordered logistic regression, showed that direct industrial engagement (B1) is a statistically significant predictor of the incorporation of industry-relevant case studies (C1) into teaching. Specifically, lecturers who are actively engaged with the industry are nearly three times as likely to integrate practical, real-world examples into their curriculum compared to those without such engagement. In contrast, the frequency of engagement (B3) did not significantly enhance curriculum delivery

practices once direct engagement was accounted for. These empirical findings underscore that it is not merely the number of interactions with industry that matters but the quality and depth of the engagement, supporting recent arguments in the literature (Korter et al., 2025; Okorafor et al., 2014).

The results indicate that meaningful partnerships between TVET institutions and industry are critical for transforming curriculum delivery, thereby ensuring that vocational training aligns with contemporary industrial practices. The study's implications are profound: by prioritizing direct industrial involvement, TVET institutions can enhance the practical orientation of their curricula, ultimately contributing to the development of a more skilled workforce and fostering sustainable economic growth. This conclusion adds to the growing body of evidence that advocates for systemic educational reforms which integrate real-world experience into academic settings (Alabi et al., 2014; Akhuemonkhan & Raimi, 2013).

Based on the results and conclusions of this study, the following recommendations are proposed to bridge the gap between TVET academics and industry:

Strengthen Industry–Academia Partnerships: TVET institutions should develop formal partnership agreements with relevant industries. Such partnerships should go beyond occasional interactions, involving collaborative curriculum development, regular industrial placements, and guest lectures by industry professionals.

Encourage Direct Industrial Engagement: Given the significant impact of direct industrial engagement on teaching practices, TVET institutions should provide incentives and support systems that enable lecturers to actively participate in industrial activities. Institutions might consider sabbatical opportunities in industry or short-term internships for faculty to gain firsthand experience.

Revise and Modernize the Curriculum: Curriculum reform should focus on making the content more relevant to the current industrial needs. This could include integrating up-to-date case studies, practical projects, and modern technologies that reflect industry practices. Industry stakeholders should be involved throughout the curriculum revision process to ensure the alignment of academic content with market realities.

Promote Professional Development for Lecturers: Continuous professional training and capacity-building initiatives should be instituted for TVET lecturers, focusing on emerging industrial trends and innovative pedagogical methods. Professional development programs can bridge the gap between theoretical knowledge and practical industry demands, thereby enhancing overall teaching effectiveness.

Policy Support and Resource Allocation: Policymakers should prioritize funding and strategic

support for initiatives that foster industry engagement within TVET institutions. This may include financial incentives for both institutions and faculty, infrastructure development for industry–academia collaboration, and the establishment of centers of excellence that serve as hubs for research and innovation in vocational education.

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REFERENCES

1. Adebamibo, K. A. (Ed.). (2007). *Vocational and technical education and training*. Gab Esther Educational Publishers.
2. Achuama, P. M. (2024). *Addressing the digital resilience challenge in the electricity sector in Nigeria: From risk to resilience* [Conference paper]. Retrieved from https://www.researchgate.net/publication/Addressing_the_Digital_Resilience_Challen ge_in_the_Electricity_Sector_in_Nigeria_From_Risk_to_Resilience
3. Afeti, G. (2006). *Strategy to revitalize technical and vocational education and training (TVET) in Africa* [Background document for the African Union's TVET Experts' Meeting, pp. 13–14]. Addis Ababa.
4. Agomuo, E. E. (2017, July 15). *The role of TVET in addressing rising youth unemployment in Nigeria* [Conference presentation]. University of Nigeria, Nsukka.
5. Agu, P. A., & Kaduhur, D. B. (2016). Repositioning skill acquisition for the transformation of Nigerian economy. *International Journal of Scientific & Technology Research, 5*(11), 62–66.
6. Akhuemonkhan, I. A., & Raimi, L. (2013). Impact of quality assurance on technical vocational education and training in Nigeria. Retrieved from IVETA Resources
7. Akpan, G. A., Usoro, H. S., & Ibiritan, S. K. (2013). The evolution of vocational education in Nigeria and its role in national development. Retrieved from https://globalacademicgroup.com/journals/
8. Alabi, T., Alana, O. O., & Bahal, M. (2014). Entrepreneurship education: A panacea to graduate unemployment in Nigeria. *Journal of Sustainable Development, 16*(4), 35–41.
9. Amu, M. E. K., & Offei-Ansah, C. (2011). Linking territory institutions to industries: Evidence from vocational and technical education. *International Journal of Vocational and Technical Education, 2*(5), 53–60.

10. Anibueze, A. U. (2013). Effects of reforms in Nigeria education sector: Voices of college staff/counseling implications. *IOSR Journal of Humanities and Social Sciences (IOSR-JHSS), 15*(6), 68–74.
11. Ansah, S. K., & Ernest, K. (2013). Technical and vocational education and training in Ghana: A tool for skill acquisition and industrial development. *Journal of Education and Practice, 4*(16), 172–180.
12. Ayonmike, C. S., Okwelle, P. C., & Okeke, B. C. (2015). Towards quality technical vocational education and training (TVET) programmes in Nigeria: Challenges and improvement strategies. *Journal of Education and Learning, 4*(1), 25–34.
13. Bello, O., & Muhammad, A. D. K. (2021). Technical and vocational education and training (TVET) sector in Nigeria: Structure, challenges and repositioning strategies. *International Journal of Research, 8*(10).
14. Dambare, M. (2016). Re-appraisal of technical vocational education components of the secondary school curriculum, Nigeria: The role of industrials [Paper presentation]. In *Proceedings of the National School Curriculum Review Conference* (Lagos, Nigeria: Federal Ministry of Education).
15. Ejiofor, T. E., & Ali, C. C. (2015). Linking TVET institutions and industries for national development: Challenges and strategies in Nigeria. *Vocational Association Journal, 20*(1).
16. Ekpo, A. H. (2011). Nigeria and its growing unemployment crisis. *Broad Street Journal*.
17. Eze, T. I., & Okorafor, A. O. (2012). New approaches to the development of technical, vocational education and training (TVET) curriculum for improved labor productivity. *International Journal of Education Researcher, 12*(1), 101–108.
18. Ezeji, S. C. O. A. (2011, October 19–21). Public/private partnership and technology, vocational education and training (TVET) [Conference presentation]. 24th Annual National Conference of the Nigeria Association of Technology (NATT), Federal College of Education (Technical) Umunze, Nigeria.
19. Fannell, S. (2007). Tilting at windmills: Public–private partnership in India. In *Education Today* [Working paper, University of Cambridge].
20. Federal Republic of Nigeria. (2004). *National policy on education*. Nigerian Educational Research and Development Council.
21. Ibeneme, O. T. (2013). Roles of technical vocational education and training in transformation of developing countries: Nigerian experience [Conference presentation]. 1st International Conference of the School of Technology Education, Federal University

of Technology, Minna, Nigeria.

22. Kilby, P. (1964). Technical education in Nigeria 1. *Bulletin of the Oxford University Institute of Economics & Statistics, 26*(2), 181–194.
23. Kotob, F. (2011). *What is sustainability?* University of Wollongong.
24. Korter, G. O., Lawal, P. O., & Korter, K. O. (2025). Bridging the gap between TVET academics and industry: Strategies for economic growth and development in Nigeria. *International Journal of Science, Architecture, Technology, and Environment, 2*(6). Retrieved from https://ijsate.com/v2i6p26/
25. Lawal, A. W. (2014). Technical and vocational education, a tool for national development in Nigeria. *International Letters of Social and Humanistic Sciences, 3*, 53–59.
26. Leney, T. (2014). *Cross-country report on VET governance in the SEMED region*. Retrieved from http://www.netme dyouth.org/sites/default/files/u pload/SEMED_VET %20gove rnance. pdf
27. Mkpa, M. A. (2014). *Overview of educational development: Pre-colonial to present day*. Retrieved from https://www.onlinenigeria.com/
28. National Board for Technical Education. (2019). *Nigerian skills qualifications framework.* Virtual Insignia.
29. Nunnally, J.C. (1978) Psychometric theory. 2nd Edition, McGraw-Hill, New York.
30. Nwogu, P. O., & Nweanomo, C. C. (2011). Vocational technical education and training for self-reliance: Towards national development. *Mediterranean Journal of Social Sciences, 5*(5), 55–59.
31. Ogbunaya, T. C., & Udoudo, E. S. (2015). Repositioning technical and vocational education and training (TVET) for youths employment and national security in Nigeria. *Journal of Education and Practice, 6*(32), 141–147.
32. Ogunruku, A. O. (2016). Leadership and governance in higher education: Challenges and prospects of developing the next generation of university leaders, academics and management models. *Nigerian Universities*.
33. Ogwo, B., & Ezekoye, B. (2020). Country study: Potential for skills partnerships on migration in Nigeria. Retrieved from https://search.ilo.org/wcmsp5/groups/public/---ed_emp/---ifp_skills/documents/genericdocument/wcms_747723.pdf
34. Ojimba, D. P. (2012). Vocational and technical education in Nigeria: Issues, problems and prospects. *Journal of Education and Social Research, 2*(9).
35. Okoye, K. R. E., & Okwelle, O. C. (2013). Technical and vocational education and training (TVET) in Nigeria and energy development, marketing and national

transformation. *Journal of Education and Practice, 4*(14), 134–139.

36. Okwelle, C., & Ayomike, C. S. (2014). Towards value re-orientation of youths on the role of technical and vocational education and training (TVET) for sustainable development in Nigeria. *Journal of Education and Practice, 5*(8), 186–191.
37. Okwelle, P. C., Deebom, M. T., Harcourt, P., & Okwelle, P. C. (2017). Technical vocational education and training as a tool for sustainable empowerment of youths in Niger Delta, Nigeria. *International Journal of Innovative Social & Science Education Research, 5*(1), 29–38.
38. Olunloyo, V. O. S. (2002). *The challenges of globalization for the design of technical curriculum in developing countries* (pp. 217–237). University of Lagos Press.
39. Osman, S. A., Omar, O., Kofi, N. T., Mat, K., Darus, Z. M., & Rahman, M. N. A. (2011). The importance of industrial training for students: Perception in the civil engineering sector. In *Proceedings of the 7th WSEAS International Conference on Education* (pp. [page range]). Kenya.
40. Okorafor, A. O., Uduanochie, C. A., & Achukwu, B. C. (2014). Sustainable mechanisms for involving industries in technology education for economic development. *World Educators Forum, 4*(1), 87–99.
41. Okoye, R., & Arimonu, M. O. (2016). Technical and vocational education in Nigeria: Issues, challenges and a way forward. *Journal of Education and Practice, 7*(3), 113– 118.
42. Okoye, K. R. E., & Okwelle, P. C. (2013). Complex mix of socio-political synergy on technical vocational education and training (TVET) in Nigeria. *Kuwait Chapter of the Arabian Journal of Business and Management Review, 3*(3), 28.
43. Okwelle, P. C., Deebom, M. T., Harcourt, P., & Okwelle, P. C. (2017). Technical vocational education and training as a tool for sustainable empowerment of youths in Niger Delta, Nigeria. *International Journal of Innovative Social & Science Education Research, 5*(1), 29–38.
44. Owolabi, H. O. (2003). Technical and vocational education in Nigeria. In J. O. O. Abiri (Ed.), *Perspectives on education in Nigeria*. University of Ilorin Publications.
45. Oviawe, J. I. (2018). Revamping technical vocational education and training through public–private partnerships for skill development. *Makerere Journal of Higher Education, 10*(1), 73–91.
46. Philips, K. P. A. (2010). *Unfolding opportunities: A baseline study of school–business relationships in Australia*. DEEWR.
47. Salabson, A. I. (2018). Repositioning vocational and technical education for economic

sustainability and national development. *Mediterranean Journal of Basic and Applied Sciences (MJBAS)*, *2*(2), 6–17.

48. UNESCO. (2006). *Participation in formal technical and vocational education and training programs worldwide*. UNESCO, UNEVOC.
49. UNESCO. (2012). *Technical and vocational education and training in the twenty-first century: UNESCO and ILO Recommendations*. UNESCO.
50. Wheelahan, L., & Moodie, G. (2016). *Global trends in TVET: A framework for social justice*. Education International.
51. Wiersum, K. F. (2015). 200 years of sustainability in forestry: Lessons from history. Environmental Management, 19, 321–329.
52. Zite, B. N., & Deebom, M. T. (2017). Enhancing technical vocational education and Training (TVET) as a tool for national development in Nigeria: Issues, challenges and strategies. Journal of Education, Society and Behavioural Science, 1–9.