



Enhancing TVET Curriculum towards Competence Development in Changing World of Work in Nigeria

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Abstract: *Technical and Vocational Education and Training (TVET) prepares people for the workforce. Due to technical and economic developments, TVET courses must be updated to equip graduates for the changing workplace. This article discusses TVET competency development and suggests ways to improve the curriculum. Industry cooperation, learner-centered methods, evolving technology, and curriculum revision promote complete and up-to-date skill learning. According to this research 300 study participants were selected using multistage sampling technique (stratify, purposive and simple random). The western Nigerian state of Ogun with three senatorial districts was studied. In each senatorial district the study chose one TVET institution with four departments. SPSS with multiple linear regressions were used to analyze questionnaire data. Component factor analysis (68.957) and Cronbach's Alpha (0.939) showed that the instrument was very reliable and consistent. The researchers found that independent variables (industry collaboration, learner-centered approaches, emerging technologies, and with the exception of curriculum redesign) have a significant effect on the dependent variable (Competence development), accounting for 78.9% of the changes in the dependent variable. The remaining 21.1 percent could be attributed to variables not considered. The independent factors had a combined significant influence on the dependent variable with a F statistic of 274.988 and a significant value of less than 5%. The study recommends that policymakers, educational institutions, and stakeholders should create a robust and adaptable TVET curriculum in response to the changing world of work and that curriculum redesign via industry collaboration, learner-centered approach, and emerging technologies in technologically based institutions should be integrated to enhance graduates' employability in the changing world of work.*

Keywords: Emerging Technology, Competence Development, Curriculum Redesign, Learner-centered approach, Industry collaboration.

Introduction

Technical and vocational education and training (TVET) systems play a critical role in equipping individuals with the knowledge and skills needed to meet the demands of the modern workforce (Okoye & Okwelle, 2013). However, the rapid pace of technological advancement and economic transformation has significantly altered the world of work, creating a need for continuous review and adaptation of educational curricula (Afeti & Adubra, 2012). TVET programs have long been recognized for their ability to enhance employability and drive economic growth by providing practical and industry-relevant skills (Maclean & Wilson, 2009). Yet, as the labor market evolves with increasing digitalization and automation, questions arise about the adequacy of current TVET systems in preparing students for the modern workplace (UNESCO-UNEVOC, 2018). In Nigeria, where unemployment remains a pressing issue, particularly among the youth, the relevance of TVET to national development becomes even more critical (Ayonmike,

Okwelle, & Okeke, 2015). Updating TVET curricula to align with global standards and the changing demands of industries is essential for addressing Nigeria's unemployment challenges and fostering sustainable economic growth (UNESCO, 2020).

Systems of technical and vocational education and training (TVET) are crucial for assisting people in obtaining knowledge and skills that are highly appreciated in the job market. The world of work has, nevertheless, grown more dynamic and demanding due to the quick speed of technological and economic development. To keep up with these changes and appropriately educate students for the issues they will confront in the workplace, the current TVET curriculum must be updated.

The importance of technical and vocational education and training (TVET) in educational systems across the globe has long been acknowledged. TVET programmes are intended to provide people the practical knowledge and



skills they need to meet the demands of different businesses, improving employability and promoting economic growth. Due to developments in the global economy, the labour market, and technological improvements, the workplace has seen major changes in recent years. New work responsibilities have emerged as a result of these developments, certain activities have been automated, and the need of digital literacy and flexibility has risen.

The applicability of TVET courses is called into question as the labour market environment continues to change. Are the TVET programmes now offered equipping students effectively for the needs of the evolving workplace? Are graduates prepared with the skills they need to succeed in a fast-paced, digitally driven workplace? Are TVET institutions working together to improve material delivery that is comparable to what is available elsewhere? In order to guarantee that TVET curricula continue to be relevant to current and future workforce needs, these issues underscore the need to assess and improve TVET curriculum. More so, its systems for technical and vocational education and training (TVET) are essential for tackling Nigeria's unemployment issues and promoting its economic development. It is essential to make sure that TVET curriculum are relevant and responsive to the demands of the existing and future workforce as the nation navigates a fast evolving labour market marked by technology breakthroughs and industrial changes.

Despite the comprehensive framework established by the Nigeria National Policy on Education highlighting the importance of Technical and Vocational Education and Training (TVET), significant gaps persist in the literature concerning its implementation and alignment with industry needs. Key areas requiring further exploration include the integration of emerging technologies, as practical challenges remain largely undocumented (Rutledge, Kehr, & Griffin, 2021); the mechanisms of industry collaboration, which lack detailed study (European Centre for the Development of Vocational Training, 2015; Randi et al., 2018); and the adaptation of global trends to Nigeria's unique socio-economic context (Kuczera & Giguère, 2017). Additionally, there is a scarcity of longitudinal assessments evaluating the long-term impact of TVET on graduate employability (Oviawe & Uwameiye, 2020), insufficient documentation of learner-centered methodologies (Winstone & Boud, 2019), and a need for tailored competency development frameworks (Glasser, 1962; Bandura, 1977). Moreover, the role of educators in implementing TVET reforms has not been adequately addressed, highlighting the necessity for targeted research to fill these gaps and inform effective policy and practice.

The main research question, this study attempts to answer is how to improve TVET curriculum to allow competence development in response to the changing nature of the

workplace. The research specifically intends to answer the following important questions: How well do present TVET curriculum reflect the changing skill requirements of industry in light of technical and economic advancements? How well do TVET institutions' revised curriculum take into account the changing demands of the labour market? To what extent should content delivery be included into the construction of TVET curricula to guarantee that graduates are prepared for the workforce and have the necessary skills. In an attempt to answer these research questions, the study seeks to provide insights and recommendations for policymakers, educational institutions, and stakeholders to enhance TVET curricula and foster competence development in the face of the ever-changing world of work.

Literature Review

The Nigeria National Policy on Education provides a comprehensive framework for guiding the nation's educational system, emphasizing the importance of education in national development. It was first introduced in 1977 and has since undergone several revisions to adapt to the evolving needs of the country (Federal Republic of Nigeria, 2013). The policy outlines Nigeria's commitment to equipping its citizens with the knowledge and skills required for socio-economic advancement (Oviawe & Uwameiye, 2020). One of the key aspects of the policy is its focus on Technical and Vocational Education and Training (TVET), which aims to develop skilled manpower for Nigeria's industrial and technological sectors (Igbokwe, 2022).

TVET is integral to Nigeria's educational system as it provides the practical and technical skills needed for employment and entrepreneurship (Oviawe, 2018). Technical Colleges of Education serve as specialized institutions under the TVET framework, offering vocational and technical education at various levels (Umar & Maigida, 2021). These colleges are designed to produce skilled technicians, artisans, and sub-professionals who can contribute to the industrial development of the country. The policy encourages a strong collaboration between technical education institutions and industries to ensure that graduates are well-prepared to meet the demands of the modern labor market (Igbokwe, 2022).

In TVET programmes, competency building is of utmost significance. Competency-based training makes sure that students obtain real-world knowledge and experience, preparing them for the workforce and enabling them to make valuable contributions. The Nigerian government has acknowledged the value of this strategy and has been working to match TVET courses with business needs to improve graduates' employability (Federal Ministry of Education, 2020).



Industry Collaboration: It is essential to work in partnership with the business community to adapt TVET courses to the needs and requirements of the market. Educational institutions may recognize new skill needs and labour market trends by regularly consulting with industry experts and businesses. The European Centre for the Development of Vocational Training (2015) notes that these collaborations may also help learners access work-based learning opportunities, internships, and apprenticeships, which expose them to real-world working situations and help them be better prepared for employment after graduation.

Learner-Centered Approaches: Learner-centered methodologies are used in TVET programmes to increase student engagement and motivation. By using these techniques, the emphasis is shifted from conventional teacher-centered training to individualized learning experiences. Students are given the opportunity to take control of their learning path and study subjects that align with their passions and professional objectives when their interests, goals, and feedback are included into the curriculum design (Winstone & Boud, 2019).

Integration of Emerging Technologies: To keep up with the evolving nature of the workplace, TVET programmes must include developing technologies like robotics, virtual reality, and artificial intelligence. Technologies like automation, virtual reality, and artificial intelligence are changing sectors and generating new employment positions. Industries are changing, and new employment opportunities are being created. Integrating these tools into training programmes gives students the digital literacy and flexibility abilities they need to succeed in businesses with cutting-edge technology (Rutledge, Kehr & Gryphon, 2021).

The theories and frameworks discussed below provide valuable insights into the design and implementation of effective TVET programs. By incorporating these theoretical perspectives, TVET institutions can ensure that their curricula are relevant, engaging, and responsive to the needs of learners and the evolving world of work. Competency-Based Education (CBE) propounded by Robert Glasser, (1962): CBE is highly suitable for TVET as it focuses on the development of practical skills and competencies needed for the workforce. By emphasizing real-world application and performance-based assessments, CBE ensures that TVET graduates are job-ready and possess the specific skills required by industries.

Malcolm Knowles, (1968) propounded the theory of adult learning andragogy which emphasizes that adults learn differently from children and have unique learning needs. Andragogy is a crucial theory to consider in the design and delivery of TVET programs, especially since many learners in vocational education are adults seeking career advancement or skill enhancement. By recognizing the unique characteristics and motivations of adult learners,

TVET institutions can tailor their teaching methods to promote active engagement, practical learning experiences, and relevance to learners' professional goals. Andragogy emphasizes the importance of self-directed learning and problem-solving, aligning well with the needs of adult learners in TVET.

The constructivist theory has roots in the works of several educators and philosophers, including Jean Piaget, Lev Vygotsky, and Jerome Bruner, (1966). Constructivism aligns seamlessly with the hands-on and practical nature of TVET. By providing learners with real-world projects and tasks, TVET programs can foster a deeper understanding of skills and knowledge. This theory promotes active learning and critical thinking, encouraging learners to construct their own understanding and meaning. TVET institutions can benefit from integrating constructivist principles into their curricula to create engaging learning experiences that facilitate skill acquisition and problem-solving capabilities.

Industry-University Collaboration: Industry-University Collaboration is essential for ensuring that TVET curricula remain relevant to labor market demands. By partnering with employers and industry experts, TVET institutions can stay up-to-date with emerging trends, technological advancements, and skill requirements. This collaboration helps bridge the gap between education and industry, resulting in graduates who possess the skills and competencies needed by employers. TVET programs that actively engage with industries are better equipped to prepare learners for successful integration into the workforce (Randi, et.al, 2018).

Albert Bandura (1977) proposed the social learning theory, which emphasized the role of observation and modeling in the learning process. The theory suggests that learning occurs through observing others and modeling their behaviors. Social Learning Theory complements TVET's emphasis on practical learning and observation. By providing opportunities for learners to engage in workplace experiences, such as internships and apprenticeships, TVET institutions enable learners to observe skilled professionals and learn from their behaviors. This observational learning process enriches the learning experience and enhances skill development. Encouraging collaborative learning and peer-to-peer interactions further supports the principles of Social Learning Theory in TVET.

Lifelong learning, according to Yeaxlee (1929), is based on the belief that learning should be continuous and extend beyond formal education. It is a foundational principle for TVET since the workforce's needs are continuously evolving. By instilling a culture of lifelong learning, TVET institutions empower graduates to adapt to changing job market demands throughout their careers. Promoting continuing education and upskilling



opportunities ensures that TVET graduates remain competitive and adaptable in their professions. TVET programs that emphasize lifelong learning contribute to the personal and professional growth of learners, fostering a skilled and agile workforce.

The concept of Human Capital Theory has roots in the works of economists, including Gary Becker and Theodore Schultz, (1964). Gary Becker's influential work on Human Capital Theory emerged in the 1960s, and Theodore Schultz's contributions also date back to the mid-20th century. Human Capital Theory underscores the importance of investing in education and training to enhance individuals' productivity and economic value. In the context of TVET, this theory reinforces the critical role of skill development in driving economic growth and development. By equipping individuals with valuable skills and competencies, TVET programs contribute to building a highly productive and capable workforce. Implementing the principles of Human Capital Theory in TVET strengthens the link between education and economic prosperity.

Kuczera and Giguère, (2017) examined the importance of competency-based training in the public sector. The study emphasizes the need for continuous learning and skill development in government organizations to meet the challenges of a rapidly evolving public service environment. The findings underscore the relevance of competence development in TVET programs to prepare graduates for diverse job roles, including those in the public sector.

Adeyemo, (2019) explores the significance of competence-based approaches in TVET curriculum development. The research highlights the benefits of involving industry stakeholders in curriculum design and the need to align TVET programs with the National Vocational Qualifications Framework. The study provides valuable insights into curriculum redesign and collaboration with industry to enhance graduates' employability.

In the paper titled "Curriculum Design and Competency Development for TVET in the Digital Era," Gupta delves into the impact of emerging technologies on TVET curricula (Gupta, 2021). The research highlights the need for a learner-centered approach, the integration of digital skills, and the incorporation of project-based learning to equip graduates with the competencies needed in a digitally-driven world. The study advocates for a dynamic and adaptable TVET curriculum that caters to the changing needs of the workforce (Gupta, 2021).

The ILO has been actively involved in promoting competency-based Technical and Vocational Education and Training (TVET) for youth employment and entrepreneurship development. Their report emphasizes the importance of competency-based training to bridge

the skills gap and enhance employability. By aligning curricula with industry needs and encouraging learner-centered approaches, TVET programs can better prepare graduates for the changing world of work (International Labour Organization, 2018).

European Centre for the Development of Vocational Training (Cedefop) examined the Role of Vocational Education and Training in Fostering Competence-Based Economy. It highlights the significance of competence-based approaches in education and therefore stresses the need for constant collaboration between TVET institutions and industries to ensure that curricula remain relevant and up-to-date with the latest developments in the job market (European Centre for the Development of Vocational Training, 2015).

Winstone and Boud, (2019) carried out a study on "Supporting Learners' Agentic Engagement with Feedback" sheds light on the importance of learner-centered approaches in education. Their research shows that when learners are actively involved in their learning journey, they become more motivated and engaged, leading to better competency development. Adopting learner-centered practices in TVET curricula can enhance students' ownership of their learning and boost their preparedness for the changing world of work.

The study by Rutledge, Kehr, and Griffin, (2021) titled "Developing Workforce Skills in Emerging Industries: The Role of Technical and Vocational Education and Training" examines the integration of emerging technologies in TVET programs. Their research highlights the importance of equipping learners with digital literacy and adaptability skills to thrive in the evolving job market. By incorporating emerging technologies into curricula, TVET institutions can ensure that graduates are well-prepared for the demands of the changing world of work.

Methodology

Ogun State being western part of Nigeria with three (3) senatorial districts (Ogun West, Ogun East and Ogun Central) was chosen as area of study. One (1) TVET Institution was selected in each senatorial district with four (4) departments from each institutions. A multiple-stage sampling technique (stratify, purposive and simple random) was adopted in the selection of 300 respondents for the study. The selected institutions from each senatorial districts represent a stratum in which four (4) department were selected in each stratum, purposively and simple random technique was subsequently employed to select the required respondents for the study. The study employed survey research design and population of the study totaled 81,000 consists of all students from Olabisi Onabanjo University (OOU), Ago-Iwoye; Federal University of Agriculture, Abeokuta



(FUNAB) and Federal Polytechnic, Ilaro (FPI).Twenty-five (25) respondents were drawn from each chosen department across the selected Institutions. Data collected through questionnaire were analyzed using multiple linear regressions with the aid of SPSS.

Results

This section serves as a crucial component of the research study, as it systematically conveys the findings derived from the research methodologies employed. This section provides a clear and concise representation of the data through various tables. The presentation of data is to facilitate a better understanding of the results, enabling researchers to draw meaningful conclusions and make informed recommendations. This approach not only enhances the clarity of the information presented but also aligns with best practices in educational research, ensuring that stakeholders can effectively interpret the implications of the findings for policy and practice.

Table 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.888 ^a	.789	.786	1.91443	2.163

a. Predictors: (Constant), Industry collaboration, Emerging Technology, Learner-centered, Curriculum Redesign.

b. Dependent Variable: Competence Development

Source: SPSS Version 28 Outputs (2024)

Table 2: ANOVA Result

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4031.380	4	1007.845	274.988	.000 ^b
	Residual	1081.190	295	3.665		
	Total	5112.570	299			

a. Dependent Variable: Competence Development

b. Predictors: (Constant), Industry collaboration, Emerging Technology, Learner-centered, Curriculum Redesign.

Source: SPSS Version 28 Outputs (2024)

Table 3: Estimated Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.656	.577		4.602	.000

Industry Collaboration	.353	.062	.458	5.733	.000
Emerging Technology	.254	.062	.331	4.123	.000
Learner-centered	.252	.062	.184	4.048	.000
Curriculum Redesign	-.068	.053	-.050	-1.277	.202

a. Dependent Variable: Competence Development

Source: SPSS Version 28 Outputs (2024)

Discussion

The result of analysis of the study revealed that independent variables (Industry collaboration; Emerging Technology and Learner-centered Approach) have significant statistical effect on dependent variable (competency development), while Curriculum Redesign possess no significant statistical impact on competency development. It was also revealed that curriculum enhancement accounted for 78.9 percent influence experienced by competence development in Nigeria education sector ($R^2 = 0.789$) with F statistic coefficient value of 274.988 and associated probability value of 0.000 that is less than 5 percent significant level ($f(4/295) = 274.988, P < 0.05$).

$$CD = \beta_0 + \beta_1 \text{Industry Collaboration} + \beta_2 \text{Emerging Technology} + \beta_3 \text{Learner-centered} + \beta_4 \text{Curriculum Redesign} + e$$

$$CD = 2.656 + \beta_1 0.353 + \beta_2 0.254 + \beta_3 0.252 - \beta_4 0.068$$

Table 1 (Model Summary) presents the coefficient of determination (R-squared), which indicates the degree to which the independent variable—curriculum enhancement, represented by Industry Collaboration, Emerging Technology, Learner-centered approaches, and Curriculum Redesign—predicted changes in the dependent variable, competency development. This metric highlights the relationship between curriculum enhancements and the development of competencies in the educational framework. Therefore, R^2 value of 0.789 amounts to 78.9 percent in competency development is accounted for by curriculum enhancement, while the remaining 21.9 percent could be attributable to other variables that were not taking into consideration in the course of this study and the adjusted R squared value of 0.786 measures the degree of error in R-squared.

The table 2 results affirm that the joint significant value of curriculum enhancement on competency development and model use for the test was of good fit, attested to by the ANOVA value ($f(4/295) = 274.988, P < 0.05$) and F statistic coefficient value of 274.988 with the associated significant probability value (0.000) which is less than 5 percent significant level.



The result in the table 3 indicates that there is no relative influence of independent variable (Curriculum Redesign) on dependent variable (competency development) and this implies that there is no significant statistical relationship between Curriculum Redesign and Competency Development (i. e. $P > 0.05$). The null hypothesis is hereby rejected.

Conversely, the result also indicates existence of a significant relationship between Independent variables (Industry Collaboration, Emerging Technology, and Learner-Centered) and dependent variable (Competency Development). This implies that there exists a positive significant statistical relationship between Industry Collaboration and Competency Development with associated probability value less than 5 percent significant level (i. e. $P < 0.05$). The null hypothesis is accepted. Also, there is a positive significant statistical relationship between the Emerging Technology and Competency Development with associated probability value less than 5 percent significant level (i. e. $P < 0.05$). The null hypothesis is accepted and the statistical relationship existed between the Learner-Centered and Competency Development exhibits a positive significant relationship with associated probability value that is less than 5 percent level of significant (i. e. $P < 0.05$) and avail the study opportunity to accept the null hypothesis.

Conclusion

Improving TVET curriculum to focus on competency development is essential in Nigeria's shifting labour market. By giving the Nigerian education sector's emphasis on industry cooperation, learner-centered methods, the incorporation of new technologies, and curriculum revision, this influence produce trained and flexible workforces that can thrive in the changing job market. TVET in Nigeria has the potential to be a key factor in promoting sustainable national development and accelerating economic progress.

The need for a proactive approach to updating and improving TVET courses is driven by the changing nature of the workplace. Building competencies is the cornerstone of training people for future employment. In order to accomplish this, educational institutions must collaborate with businesses, implement learner-centered strategies, incorporate new technology, and revamp their curricula.

Based on the study's findings regarding the significant impact of industry collaboration, emerging technology, and learner-centered approaches on competency development within Nigeria's Technical and Vocational Education and Training (TVET) sector, the following recommendations are made to enhance the effectiveness of TVET programs:

- (i) Stakeholders should collaborate to ensure that curricula are responsive to both academic standards and practical industry needs.
- (ii) Through frequent forums, seminars, and partnerships, collaboration between TVET institutions and companies should be encouraged in the creation of instruction manuals. This will guarantee that the curriculum remains current and in line with market demands.
- (iii) TVET institutions should use flexible learning paths that may accommodate students' various needs and objectives in order to implement learner-centered methods to content delivery.
- (iv) Prioritizing the use of contemporary (new) technology should be done to provide students with requisite capabilities in the world of work.

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