Journal of People and Worldviews (JPW)

Maiden Edition, Volume 1, Number 1 (Part 2)

Empirical Article

Open Access

Bridging the Gap between Informal Apprenticeship and Formal Technical Education for Curriculum Integration in Nigeria

Abstract

Technical and Vocational Education and Training (TVET) in Nigeria faces persistent gaps between formal curriculum frameworks and the skills acquired through informal apprenticeship systems. Informal apprenticeship remains a major source of practical skill development in trades such as mechanics, welding, electrical installation, and carpentry, yet it operates largely outside formal TVET structures, limiting certification opportunities and labour mobility.This study examined pedagogical practices in informal apprenticeship, while mapping competencies against formal TVET curriculum standards, through developing a Hybrid Curriculum Integration Framework suitable for Nigeria. A mixed-method explanatory design was employed, with data collected from 60 master craftsmen, 120 apprentices, 30 TVET instructors, and 10 NBTE curriculum officials across three purposively selected states. Data collection instruments included semi-structured interviews, structured questionnaires, document analysis, and competency mapping matrices. Qualitative data were analyzed thematically, while quantitative data were summarized using descriptive statistics and competency alignment indices. Findings revealed substantial overlap in practical competencies such as tool handling, safety procedures, and task execution, but significant divergence in theoretical knowledge, assessment practices, and documentation standards. Key barriers to integration included limited policy support, inadequate recognition of informal skills, and weak collaboration between TVET institutions and master craftsmen. Based on these findings, a Hybrid Curriculum Integration Framework was proposed incorporating Recognition of Prior Learning (RPL), modular competency alignment, co-certification mechanisms, and structured industry engagement. The framework provides a practical pathway for harmonizing informal and formal skill acquisition systems, improving employability outcomes, and strengthening policy coherence within Nigeria's TVET sector.

Keywords: Technical Education, Vocational Education, Formal and Informal Apprenticeship, Curriculum Integration, Hybrid Curriculum Framework

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Date Received: 16th March, 2026

Date Accepted: 22nd March, 2026

Doi: https://doi.org/10.5281/zenodo.19384400

Introduction

Technical and Vocational Education and Training (TVET) plays a critical role in developing the technical skills required for national economic growth and sustainable development. In Nigeria,

strengthening the technical workforce has become important as the country seeks to expand industrial capacity, improve employment opportunities, and enhance productivity across key sectors of the economy. Formal TVET institutions regulated by the National Board for Technical Education are designed to produce competent technicians through structured curricula that combine theoretical instruction with practical training (NBTE, 2018). Despite these objectives, significant gaps persist between the competencies delivered in formal TVET institutions and the practical skills demanded in the labour market. A substantial proportion of technical skill development in Nigeria occurs outside formal educational institutions through informal apprenticeship systems. Within this system, master craftsmen train apprentices in practical trades such as mechanics, welding, electrical installation, carpentry, and metal fabrication in real workplace environments. Unlike formal TVET programmes, informal apprenticeship training typically operates without standardized curricula, formal assessment procedures, or nationally recognized certification mechanisms. Nevertheless, these systems remain widespread due to their cultural relevance, accessibility, relatively low training costs, and employers' preference for workers with practical hands-on experience (International Labour Organization, 2020; Zite & Deebom, 2021).

The coexistence of formal TVET institutions and informal apprenticeship systems has created a fragmented skills development landscape in Nigeria. While formal TVET emphasizes structured theoretical instruction and standardized certification, informal apprenticeship prioritizes experiential learning through demonstration, mentorship, and repetitive practice. This separation limits opportunities for recognizing competencies acquired informally and restricts the mobility of skilled artisans within the national qualifications framework. Consequently, many apprentices who acquire substantial technical skills lack formal certification, thereby reducing their opportunities for further education, employment advancement, and participation in the formal economy (Cedefop, 2020). Scholars have increasingly highlighted the need to bridge the divide between formal and informal skill acquisition systems in Nigeria. Studies indicate that although formal TVET programmes aim to produce technically competent graduates, they often face challenges related to outdated curricula, inadequate infrastructure, and weak industry collaboration (Auta, 2022; Njoku et al., 2015). These limitations contribute to persistent skills mismatches between TVET graduates and labour market requirements.

At the same time, informal apprenticeship systems have demonstrated considerable effectiveness in producing practically skilled artisans through workplace-based learning and sustained mentorship (Zite & Deebom, 2021). Research indicates that apprentices trained in informal settings

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frequently demonstrate strong competencies in areas such as equipment handling, troubleshooting, and occupational safety. However, the absence of structured curricula, documentation, and standardized assessment mechanisms prevents these competencies from being formally recognized within the national TVET framework (Osuyi & Ogbebor, 2024). Recent scholarship suggests that significant overlaps exist between competencies developed through informal apprenticeship and those outlined in formal TVET curricula. Comparative studies reveal strong alignment in practical skill areas such as tool usage, task execution, and workplace safety, although gaps remain in theoretical knowledge, documentation practices, and formal assessment procedures (Osuyi & Ogbebor, 2024; Zite & Deebom, 2021). Ajibade and Amodu (2025) further argue that effective TVET curricula should integrate experiential learning approaches with theoretical instruction to ensure that graduates possess both conceptual understanding and workplace readiness.

Recognition of Prior Learning (RPL) has emerged internationally as an important mechanism for validating skills acquired outside formal education systems. Through RPL, competencies gained through informal training and workplace experience can be assessed and recognized within formal qualifications frameworks (Cedefop, 2020). However, within the Nigerian TVET system, RPL remains underdeveloped and rarely implemented, limiting the ability of informally trained artisans to obtain formal certification or transition into advanced training opportunities. Beyond the informal–formal divide, existing literature also highlights broader challenges related to industry engagement in TVET curriculum development. Employers frequently report that TVET graduates lack sufficient exposure to real workplace technologies and practices (Njoku et al., 2015; Auta, 2022). These concerns underscore the need for stronger collaboration between educational institutions, industry actors, and informal training networks to ensure that curricula reflect contemporary labour market realities. Despite growing recognition of the importance of informal apprenticeship within Nigeria's skills ecosystem, there remains a significant gap in empirical research that systematically examines how informal apprenticeship practices can be integrated into formal TVET curriculum frameworks. While previous studies have explored the effectiveness of informal apprenticeship training and the challenges facing formal TVET institutions, limited research has proposed structured models for curriculum integration capable of harmonizing both systems.

This study therefore seeks to address these gaps by examining the pedagogical practices of informal apprenticeship systems, assessing the alignment of competencies between informal and formal training pathways, identifying barriers to integration, and proposing a hybrid curriculum

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framework capable of bridging informal and formal skill acquisition systems within Nigeria's TVET sector.

Statement of the Problem

Although informal apprenticeship remains a dominant mode of skill acquisition in Nigeria, it operates largely independent from formal TVET institutions. This separation creates structural inefficiencies, limits nationally recognized certification opportunities for informally trained artisans, and weakens policy coherence within Nigeria's skills development architecture. Existing curriculum frameworks do not adequately incorporate indigenous apprenticeship methodologies, nor do they systematically recognize prior informal learning experiences. Without effective integration, Nigeria's workforce development system remains fragmented, thereby undermining national objectives for industrialization, employment generation, and sustainable economic growth. This study therefore addresses this gap by proposing a structured integration model linking informal apprenticeship systems to formal TVET curriculum frameworks.

Objectives of the Study

The general objective of the study is to examine the relationship between informal apprenticeship systems and formal Technical and Vocational Education and Training (TVET) in Nigeria with the aim of developing a curriculum model that bridges informal and formal skill acquisition systems.

Specifically, the study will:

1. Identify and analyze the pedagogical practices that characterize informal apprenticeship systems in Nigeria.
2. Assess the extent to which competencies acquired through informal apprenticeship align with the standards of formal Technical and Vocational Education and Training (TVET) curriculum
3. Examine the structural and policy barriers that hinder the integration of informal apprenticeship systems with formal TVET institutions.
4. Develop a curriculum model that can effectively bridge informal apprenticeship training and formal Technical and Vocational Education Training systems.

Research Questions

i. What pedagogical practices characterize informal apprenticeship systems in Nigeria?
ii. To what extent do competencies acquired informally align with formal TVET curriculum standards?
iii. What structural and policy barriers hinder integration of informal apprenticeship systems with formal TVET institutions.
iv. What curriculum model can effectively bridge informal and formal skill acquisition systems?

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Methodology

This study adopted a mixed-method explanatory design to investigate the integration of informal apprenticeship practices into the formal TVET curriculum in Nigeria. The population comprised 60 master craftsmen, 120 apprentices, 30 TVET instructors, and 10 NBTE curriculum officials across three purposively selected states. Data collection involved semi-structured interviews with master craftsmen and curriculum officers, structured questionnaires administered to apprentices and TVET instructors, and document analysis of formal curriculum guidelines alongside apprenticeship practice notes. Competency mapping matrices were employed to identify overlaps and gaps between informal apprenticeship skills and formal curriculum competencies. This study is exploratory and descriptive, focusing on mapping competencies, identifying gaps, and developing a framework rather than testing causal relationships. Therefore, formal hypotheses were not formulated. Instead, the study is guided by research questions, allowing systematic investigation of pedagogical practices, competency overlaps, barriers to integration, and framework components. This approach aligns with accepted methods for exploratory studies in TVET research (Osuyi & Ogbebor, 2024; Ajibade & Amodu, 2025). Qualitative data were analyzed thematically to extract patterns in instructional practices, while quantitative data were summarized using descriptive statistics and competency alignment indices, providing a comprehensive foundation for developing a Hybrid Curriculum Integration Framework.

Results

Research Question1: What pedagogical practices characterize informal apprenticeship systems in Nigeria?

Table 1: Frequency and percentages of Pedagogical Practices of Informal Apprenticeship

Pedagogical Practice	Frequency (n=60)	Percentage (%)
Hands-on demonstration	58	97
Repetitive task practice	55	92
Mentorship by master craftsmen	60	100
Peer learning	40	67
Problem-solving on real projects	52	87
Limited theoretical instruction	24	40

Interpretation:

Table one above shows that informal apprenticeship emphasizes practical, hands-on training guided by mentorship, with minimal theoretical instruction. This confirms the experiential nature of skill acquisition in informal settings.

Research Question 2: To what extent do competencies acquired informally align with formal TVT curriculum standards?

Table 2: Percentages of Competency Mapping Between Informal Apprenticeship and Formal TVET

Competency Area	Informal Apprenticeship (%)	Formal TVET Curriculum (%)	Overlap (%)

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Competency Area	Informal Apprenticeship (%)	Formal TVET Curriculum (%)	Overlap (%)
Tool Handling & Equipment Use	95	90	90
Safety Procedures	88	85	83
Task Execution	92	87	80
Theoretical Knowledge	40	85	35
Assessment & Documentation	20	90	18

Interpretation:

Table two above indicate that Practical competencies such as tool handling and task execution show high overlap, while theoretical knowledge and documentation have low alignment, indicating areas for integration in formal curricula.

Research Question 3: What structural and policy barriers hinder integration of informal apprenticeship systems with formal TVET institutions

Table 3: Structural and Policy Barriers

Barrier	Source of Report	Frequency	Percentage (%)
Limited recognition of informal skills	Apprentices, Master Craftsmen	110	92
Lack of formal assessment standards	TVET Instructors	28	93
Weak collaboration between institutions & masters	NBTE officials, Instructors	32	91
Limited policy support for integration	NBTE officials	10	100
Insufficient funding & infrastructure	TVET Institutions	25	83

Interpretation:

Table three above shows that barriers hindering integration are primarily policy and structural, including limited recognition, inadequate assessment, and poor collaboration, which impede integration of informal apprenticeship into formal TVET.

Research Question 4: What curriculum model can effectively bridge informal and formal skill acquisition systems?

Table 4: Hybrid Curriculum Integration Framework Components

Component	Description	Expected Benefit
Recognition of Prior Learning (RPL)	Formal validation of skills acquired informally	Certification and mobility
Modular Competency Alignment	Mapping informal skills to formal curriculum modules	Harmonization of learning outcomes
Co-certification Mechanisms	Joint assessment by master craftsmen and TVET instructors	Legitimacy and credibility of skills
Structured Industry Engagement	Workplace attachments and mentor collaborations	Practical exposure and employability
Documentation & Assessment Standardization	Standard templates for task performance and progress tracking	Quality assurance and policy compliance

Interpretation:

The framework addresses gaps in theory, assessment, and certification while preserving practical skill acquisition. Implementing these components can harmonize informal and formal skill systems.

Discussion

The interpretation of Table 1 shows that informal apprenticeship relies heavily on hands-on demonstration, repetitive practice, and mentorship.

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Minimal theoretical instruction confirms the experiential, practice-based nature of informal skill acquisition (Osuyi & Ogbebor, 2024; Zite & Deebom, 2021). These findings suggest that formal TVET curricula can benefit from embedding practical modules informed by apprenticeship practices, while maintaining structured theory to ensure conceptual understanding. Integrating mentorship and peer learning approaches into classroom settings can further enhance competency acquisition.

Table 2 interpretation indicates high alignment in practical skills (80–90%), including tool handling, task execution, and safety procedures, while theoretical knowledge and documentation remain weakly aligned. This confirms the need for modular integration of informal competencies into formal curricula. By formalizing assessment and embedding theoretical components alongside practical exercises, TVET institutions can achieve balanced learning outcomes that reflect both real-world skills and conceptual understanding (Ajibade & Amodu, 2025).

The interpretation of Table 3 highlights policy and structural barriers such as limited recognition of informal skills, weak institutional collaboration, and inadequate assessment frameworks. These barriers are consistent with previous research (Njoku et al., 2015) which indicate that Recognition of Prior Learning (RPL), co-certification mechanisms, and policy support are critical for successful integration. Addressing these barriers can legitimize informal apprenticeship skills within formal TVET, enhance mobility, and improve workforce readiness.

Table 4 interpretation shows that the proposed Hybrid Curriculum Integration Framework addresses gaps in assessment, documentation, and theoretical grounding while preserving the strengths of experiential learning. Components such as RPL, modular competency alignment, **co-**certification, and structured industry engagement offer a practical pathway to harmonize informal and formal skill systems. Implementing this framework can enhance employability, certification legitimacy, and alignment with labour market demands (Cedefop, 2020).

Conclusion

This study examined the integration of informal apprenticeship practices into the formal TVET curriculum in Nigeria. Findings revealed that informal apprenticeship provides highly practical, hands-on skills, including tool handling, task execution, and safety procedures, which **are** largely aligned with formal TVET competencies**.** However, gaps exist in theoretical knowledge, standardized assessment, and documentation, creating barriers to formal recognition and mobility for apprentices. Structural and policy limitations, such as limited collaboration between institutions and master craftsmen, weak policy support, and lack of formal recognition mechanisms, further hinder integration. The proposed Hybrid Curriculum Integration Framework, incorporating Recognition of Prior Learning (RPL),

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modular competency alignment, co-certification, and structured industry engagement, offers a practical pathway to harmonize informal and formal skill acquisition systems. Implementing this framework can improve employability, legitimize informal skills, and enhance the relevance of TVET in Nigeria.

Recommendations

Based on the findings of this study, the following recommendations are proposed:

i. Relevant regulatory bodies, particularly the National Board for Technical Education (NBTE), should establish formal Recognition of Prior Learning (RPL) mechanisms to validate competencies acquired through informal apprenticeship systems. This will enable skilled apprentices to obtain nationally recognized certification, thereby improving labour mobility, employability, and progression within the formal Technical and Vocational Education and Training (TVET) framework.
ii. TVET curriculum developers should incorporate practical competencies derived from informal apprenticeship systems into formal curriculum through modular competency-based units. Such integration will ensure better alignment between hands-on occupational skills and theoretical instruction within Nigeria's TVET programmes.
iii. A joint assessment framework involving both TVET instructors and master craftsmen should be developed to support competency verification and co-certification. This collaborative approach will enhance the credibility, transparency, and industry relevance of skills assessment processes.
iv. Stronger partnerships should be established between formal TVET institutions and informal apprenticeship training centers. These partnerships should facilitate structured workplace learning, mentorship programmes, and experiential training opportunities, thereby bridging the gap between institutional learning and industry practice.
v. Government agencies responsible for skills development should formulate and implement supportive policies that promote the integration of informal and formal training systems. Such policies should include funding provisions for infrastructure development, incentives for collaboration between training stakeholders, and frameworks that recognize informal training institutions within the national skills ecosystem.
vi. Standardized templates and procedures should be developed for documenting, monitoring, and assessing practical competencies acquired through informal apprenticeship. This will improve quality assurance,

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accountability, and traceability of skill acquisition within integrated training pathways.

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