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INDUSTRY–ACADEMIA PERSPECTIVES ON ASSESSING AND CERTIFYING LIFELONG LEARNING COMPETENCIES IN CONSTRUCTION-RELATED TVET PROGRAMMES IN NIGERIA

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Abstract: *The evolving nature of the construction industry demands professionals who possess not only technical expertise but also lifelong learning competencies such as adaptability, problem-solving, and continuous professional development. However, concerns remain regarding whether construction-related Technical Vocational Education and Training (TVET) programmes in Nigeria effectively assess and certify these competencies. This study investigates industry–academia perspectives on the assessment and certification of lifelong learning competencies in construction-related TVET programmes. A qualitative research design was adopted, involving semi-structured interviews with fourteen participants comprising seven TVET educators and seven construction industry professionals selected through purposive sampling. Data were analysed using thematic analysis supported by NVivo. The findings reveal a shared recognition among educators and industry professionals that lifelong learning competencies are critical for sustaining professional relevance in the construction sector. However, existing assessment practices remain largely examination-driven and insufficient for evaluating broader competencies such as adaptability, critical thinking, and collaborative problem-solving. Industry participants further indicated that current TVET certification systems often signal programme completion rather than verified workplace competence. The study also identified systemic constraints, including limited industry participation in assessment processes, inadequate training facilities, and weak institutional collaboration with the construction sector. The study argues that strengthening industry–academia partnerships, expanding workplace-based learning opportunities, and adopting competency-based certification frameworks are essential for aligning TVET outcomes with industry expectations. These reforms are crucial for ensuring that graduates of construction-related TVET programmes possess both technical proficiency and lifelong learning capabilities required for sustainable professional development.*
Keywords: *Lifelong learning competencies, construction-related TVET, competency-based assessment, industry–academia collaboration, TVET certification, Nigeria.*

Introduction

Technical Vocational Education and Training (TVET) play a critical role in preparing individuals with practical skills and competencies required for productive participation in the labour market. Globally, TVET systems are increasingly positioned within the broader framework of lifelong learning, emphasizing continuous skill development throughout an individual's career. Lifelong learning refers to a holistic process of acquiring knowledge, skills, values, and competencies across the lifespan and through various learning contexts, including formal, non-formal, and informal settings. This perspective recognizes that learning is no longer limited to the early stages of life but continues throughout professional and personal development as individuals adapt to evolving social, technological, and economic conditions (UIL, 2024).

Within the TVET context, lifelong learning competencies include not only technical skills but also transversal abilities such as problem-solving, communication, adaptability, and the capacity for continuous self-improvement. These competencies are increasingly considered essential as industries experience rapid technological change and evolving work practices. International frameworks emphasize that TVET should equip learners with a combination of occupational skills and transferable competencies that enable them to transition between education and employment while maintaining long-term employability (UNESCO, 2015; ILO, 2019; UNESCO, 2022).

The relevance of lifelong learning competencies is particularly evident in the construction sector, where technological advancement, digitalization, and evolving project management practices require workers to continuously upgrade their knowledge and skills. In many countries, including Nigeria, the construction industry remains a major contributor to economic development, infrastructure provision, and employment generation. However, the sector has long faced challenges related to shortages of skilled technicians and inadequately prepared graduates entering the workforce. Studies have shown that gaps often exist between the competencies expected by industry and those developed within TVET institutions, thereby affecting productivity and workforce efficiency in the construction sector (Dabok et al., 2022; Auta & Onwusuru, 2022).

One of the factors contributing to this mismatch is the limited integration of industry perspectives in the design, assessment, and certification of competencies within TVET programmes. Effective collaboration between educational institutions and industry stakeholders is widely recognized as a crucial strategy for aligning training outcomes with labour market demands (Mulder, 2017). Industry–academia partnerships can support curriculum development, provide opportunities for work-based learning, and ensure that training reflects real workplace practices (Tibi, 2015; Okon, 2019).

Beyond curriculum alignment, assessment and certification processes are also central to ensuring that graduates possess the competencies required for professional practice. Competency-based assessment systems are increasingly advocated within TVET to evaluate learners' ability to apply knowledge and skills in real-life occupational contexts. However, in many developing countries, assessment practices still focus heavily on theoretical knowledge, with limited mechanisms for validating broader lifelong learning competencies such as adaptability, innovation, and collaborative problem-solving. This limitation raises concerns about the reliability and relevance of certification systems in reflecting actual workplace competence (Raelin, 2008; Mulder, 2017).

In the Nigerian context, strengthening mechanisms for assessing and certifying lifelong learning competencies within construction-related TVET programmes has become increasingly important. The construction industry requires graduates who can continuously learn, adapt to new technologies, and engage effectively in multidisciplinary project environments. Understanding how both academic institutions and industry professionals perceive current assessment and certification practices is therefore essential for improving the effectiveness of TVET systems.

Against this background, this study explores industry–academia perspectives on the assessment and certification of lifelong learning competencies in construction-related TVET programmes in Nigeria. By examining the views of both TVET educators and construction industry professionals, the study seeks to identify existing practices, challenges, and opportunities for strengthening competency assessment frameworks that better support lifelong learning and workforce development in the construction sector.

Statement of the Problem

The construction industry is evolving rapidly due to technological innovation, digital construction practices, and increasingly complex project environments. As a result, workers in the sector are expected not only to possess strong technical skills but also to demonstrate lifelong learning competencies such as adaptability, critical thinking, collaboration, and the ability to continuously update their knowledge. These competencies are particularly important in Technical Vocational Education and Training (TVET), where the goal is to prepare learners for immediate entry into the workforce while also enabling them to remain employable throughout their careers (UNESCO, 2016; UNESCO, 2022).

Despite the recognized importance of lifelong learning competencies, concerns remain about how effectively these competencies are assessed and certified within construction-related TVET programmes in Nigeria. Many TVET assessment systems still place significant emphasis on theoretical examinations

and routine practical tasks, which may not adequately capture broader competencies such as problem-solving, innovation, teamwork, and the capacity for continuous learning. Consequently, the certificates awarded to graduates may not fully reflect the range of skills and capabilities required in modern construction workplaces.

Another challenge lies in the limited involvement of industry stakeholders in the processes of competency assessment and certification. While construction firms are the primary employers of TVET graduates, their perspectives are not always systematically integrated into assessment frameworks within educational institutions. This disconnect can lead to a mismatch between the competencies developed in training programmes and those required by the construction industry (Okoye, 2016; Auta & Onwusuru, 2022).

Furthermore, the lack of clearly defined mechanisms for recognizing lifelong learning competencies within TVET certification systems raises concerns about the credibility and relevance of qualifications awarded to graduates. Without effective collaboration between industry and academia, assessment practices may fail to reflect real workplace expectations. Understanding how both TVET educators and construction industry professionals perceive current assessment and certification practices is therefore essential for identifying gaps and developing more effective approaches. This study seeks to address this gap by exploring industry–academia perspectives on assessing and certifying lifelong learning competencies in construction-related TVET programmes in Nigeria.

Research Questions

The study is guided by the following research questions:

1. How do TVET educators and construction industry professionals perceive lifelong learning competencies in construction-related TVET programmes in Nigeria?
2. What methods are currently used to assess lifelong learning competencies in construction-related TVET programmes?
3. What are the perspectives of industry professionals regarding the certification of lifelong learning competencies in TVET graduates?
4. What challenges exist in assessing and certifying lifelong learning competencies in construction-related TVET programmes?
5. What strategies can enhance industry–academia collaboration in the assessment and certification of lifelong learning competencies?

Literature Review

Concept of Lifelong Learning in Technical Vocational Education and Training (TVET)

Lifelong learning has become a central principle guiding modern education and workforce development systems. The concept refers to the continuous acquisition of knowledge, skills, and competencies throughout an individual's life in formal, non-formal, and informal learning contexts. Lifelong learning is essential for enabling individuals to adapt to changing labour market conditions, technological advancement, and evolving societal needs. Within the context of Technical Vocational Education and Training (TVET), lifelong learning emphasizes the development of both occupational skills and transferable competencies that support continuous professional growth (UNESCO, 2015).

In recent years, policymakers and scholars have increasingly recognized that traditional models of vocational education that focus solely on initial training are insufficient for preparing workers for modern economies. Instead, TVET systems are expected to provide flexible learning pathways that allow individuals to continuously upgrade their skills throughout their careers. Lifelong learning in TVET therefore extends beyond the acquisition of technical competencies to include broader capabilities such as critical thinking, communication, problem-solving, adaptability, and the ability to learn independently (UIL, 2024).

In the Nigerian context, the integration of lifelong learning principles into TVET has been widely advocated as a strategy for addressing unemployment and improving workforce productivity. However, the implementation of lifelong learning within TVET programmes remains uneven due to factors such as limited resources, inadequate industry collaboration, and weak competency assessment frameworks. These challenges highlight the need to strengthen mechanisms that support the recognition and development of lifelong learning competencies within TVET systems (Agbo & Nnajiofor, 2023; Chiamogu & Chiamogu, 2025).

Lifelong Learning Competencies Required in the Construction Industry

The construction industry is characterized by continuous technological advancement, evolving project delivery methods, and increasing demands for efficiency and sustainability. As a result, construction professionals and technicians must possess not only technical skills but also the ability to continuously update their knowledge and adapt to new working environments. Lifelong learning competencies such as problem-solving, teamwork, digital literacy, and innovation have therefore become increasingly important for workers in the construction sector. Research indicates that the construction industry often requires workers who can effectively apply practical skills while also demonstrating the capacity to learn new techniques and technologies throughout their careers. With the growing adoption of digital construction tools, including Building Information Modelling (BIM) and other digital project management systems, workers must be capable of continuous learning in order to remain productive and relevant in the industry (Dabok et al., 2022; UIL 2024).

In Nigeria, several studies have identified a persistent skills gap between the competencies possessed by TVET graduates and the expectations of employers within the construction sector. This gap has been attributed to inadequate training facilities, outdated curricula, and insufficient engagement between educational institutions and industry stakeholders. Addressing this challenge requires not only improvements in curriculum design but also more effective approaches to assessing and certifying competencies that reflect real workplace requirements (Auta & Onwusuru, 2022; Chiamogu & Chiamogu, 2025).

Assessment Practices in Construction-related TVET Programmes

Assessment plays a critical role in determining whether learners have successfully acquired the competencies required for professional practice. In TVET programmes, assessment is expected to measure both theoretical knowledge and practical skills. However, traditional assessment methods in many TVET institutions still rely heavily on written examinations and routine practical exercises, which may not adequately capture the full range of competencies required in modern workplaces. Competency-based assessment has increasingly been recommended as a more effective approach for evaluating learners in vocational education. This approach focuses on the demonstration of practical skills and the ability to apply knowledge in real-world contexts rather than simply recalling theoretical information. Competency-based assessment systems are essential for ensuring that TVET graduates possess skills that are relevant to industry needs (UNESCO, 2015).

Despite the benefits of competency-based assessment, its implementation in many developing countries remains limited. In Nigeria, assessment practices within construction-related TVET programmes often face challenges such as inadequate assessment facilities, insufficient industry participation, and a lack of standardized frameworks for evaluating broader competencies such as creativity, adaptability, and teamwork. These limitations can reduce the effectiveness of certification systems and weaken employers' confidence in TVET qualifications.

Certification and Competency Recognition in TVET

Certification is a key component of vocational education systems because it provides formal recognition of the skills and competencies acquired by learners. In well-functioning TVET systems, certification

processes are closely aligned with industry standards to ensure that qualifications accurately reflect workplace competence. This alignment enhances the credibility of vocational qualifications and improves the employability of graduates. However, in many contexts, certification systems tend to emphasize the completion of training programmes rather than the demonstration of comprehensive competencies. As a result, certificates may not always provide reliable evidence of a graduate's ability to perform effectively in the workplace. Effective certification systems should incorporate mechanisms for recognizing both formal and informal learning, particularly in industries where workers acquire skills through practical experience (Raelin, 2008; Mulder, 2017; UIL, 2024).

In Nigeria, the development of competency-based certification frameworks has been identified as an important step toward improving the effectiveness of TVET programmes. Such frameworks can help ensure that graduates are assessed based on their ability to perform occupational tasks and demonstrate lifelong learning competencies required in their respective industries.

Industry Participation in Skills Assessment and Certification

Collaboration between educational institutions and industry stakeholders is widely regarded as essential for improving the quality and relevance of TVET programmes. Industry participation in training, assessment, and certification processes helps ensure that vocational education reflects current workplace practices and technological developments (Raelin, 2008; Mulder, 2017).

Several studies emphasize that strong industry–academia partnerships can significantly enhance the effectiveness of competency assessment systems. Industry experts can contribute to the design of assessment standards, provide opportunities for workplace-based training, and participate in evaluating students' practical skills. Such collaboration ensures that certification systems accurately reflect the competencies required by employers (Okon, 2019; Agbo & Nnajiofor, 2023; Chiamogu & Chiamogu, 2025).

In Nigeria, however, industry involvement in TVET assessment processes remains relatively limited. Challenges such as weak institutional partnerships, lack of structured collaboration mechanisms, and insufficient policy support have been identified as barriers to effective industry participation. Strengthening these partnerships is therefore critical for improving the credibility and relevance of TVET qualifications in the construction sector (Tibi, 2015; Akinola et al, 2020; Chiamogu & Chiamogu, 2025).

Gaps in Current Assessment and Certification Systems in Nigeria

Despite increasing recognition of the importance of competency-based education, several gaps remain in the assessment and certification of lifelong learning competencies within Nigerian TVET programmes. One major challenge is the limited emphasis placed on evaluating transferable competencies such as adaptability, critical thinking, and lifelong learning abilities. Existing assessment systems in many TVET institutions continue to prioritise the evaluation of technical knowledge and routine practical skills rather than broader competencies that support continuous professional development. This narrow focus reduces the ability of assessment frameworks to capture the dynamic competencies required for modern construction practice, where professionals must continuously adapt to evolving technologies, materials, and work processes (UNESCO, 2022).

Another significant gap relates to the insufficient integration of industry perspectives into assessment frameworks. In many cases, employers and industry professionals are not actively involved in designing assessment criteria or validating competency standards. Without meaningful industry participation, assessment practices may fail to reflect the realities of construction workplaces and the competencies required for effective job performance. This disconnect between training outcomes and labour market expectations has been widely identified as a contributing factor to the persistent skills mismatch between TVET graduates and employer requirements in Nigeria. As a result, graduates may possess formal

qualifications but still require additional workplace training to meet industry expectations (Akinola et al, 2020; Chiamogu & Chiamogu, 2025).

Furthermore, the absence of standardized frameworks for assessing lifelong learning competencies makes it difficult for educational institutions to consistently evaluate these skills. While competency-based education is increasingly promoted within TVET policy frameworks, many institutions lack clearly defined assessment indicators for competencies such as problem-solving, adaptability, and self-directed learning. The lack of clear benchmarks and evaluation tools limits the ability of certification systems to accurately represent the broader competencies required for long-term professional development. Consequently, certification often reflects programme completion rather than a comprehensive demonstration of occupational competence. (Akinola et al, 2020; Chiamogu & Chiamogu, 2025).

Addressing these gaps requires stronger collaboration between TVET institutions and industry stakeholders, as well as the development of more comprehensive competency-based assessment frameworks. Greater industry involvement in assessment design, workplace-based evaluation, and competency validation can help ensure that certification systems reflect real-world professional requirements. In addition, establishing standardized frameworks for assessing lifelong learning competencies would enable institutions to more effectively measure the skills needed for sustained career development in the construction sector. Understanding the perspectives of both academic and industry actors is therefore essential for strengthening assessment and certification practices within construction-related TVET programmes in Nigeria.

Methodology

This study adopted a qualitative research design to explore stakeholders' perspectives on the integration of digital technologies in construction training within Industrial Technology Education. (Creswell & Poth, 2023).

Purposive sampling technique was used to select participants who possessed relevant experience and knowledge related to construction training and workforce competence. A total of 14 participants were involved in the study, comprising 7 TVET Educators teaching construction-related courses in tertiary institutions and 7 Industry Professionals working in the construction industry (Patton, 2014).

Data were collected through semi-structured interviews, which allowed the researchers to explore participants' views while still maintaining consistency across interviews. Interviews were conducted through virtual platform (Miles et al., 2014).

The collected data were analysed using thematic analysis following the procedures outlined by Braun and Clarke (2006). Interview transcripts were coded and organised using NVivo qualitative data analysis software to identify key themes and patterns related to stakeholders' perspectives on digital technologies in construction training.

Ethical principles were observed throughout the study. Participants were informed about the purpose of the research and their participation was voluntary. Informed consent was obtained before conducting the interviews, and participants were assured that their responses would be treated confidentially. To protect participants' anonymity, identification codes (P1–P14) were used instead of real names in the reporting of the findings (Creswell & Poth, 2023).

Table 1. Participants' profile

Participant Code	Participant Category	Years of Experience
P1	TVET Educator	12 years
P2	TVET Educator	9 years

P3	TVET Educator	15 years
P4	TVET Educator	8 years
P5	TVET Educator	11 years
P6	TVET Educator	18 years
P7	TVET Educator	7 years
P8	Industry Professional	16 years
P9	Industry Professional	10 years
P10	Industry Professional	14 years
P11	Industry Professional	13 years
P12	Industry Professional	9 years
P13	Industry Professional	12 years
P14	Industry Professional	17 years

Results

The findings are presented in table 2 according to the major themes and sub-themes and supported with direct quotations from participants. Participants were identified using codes (P1–P14) to ensure anonymity.

Table 2. Themes, Sub-themes, and Participant Quotes

S/N	Theme	Sub-theme	Participant Quotes
1	Perceptions of Lifelong Learning Competencies in Construction TVET (Research question 1)	Continuous professional development	"Lifelong learning means that construction professionals must continuously upgrade their knowledge because construction methods and technologies are constantly evolving." (TVET Educator, P1)
		Adaptability to technological and industry changes	"In the construction sector, workers must be able to adapt to new technologies and building techniques, otherwise their skills quickly become outdated." (TVET Educator, P3)
		Self-directed learning	"Students should develop the ability to learn independently so they can keep improving themselves even after graduation." (TVET Educator, P7)
		Problem-solving and critical thinking	"Construction professionals often face unexpected problems on site, so lifelong learning involves developing strong problem-solving abilities." (Industry Professional, P9)
2	Current Approaches to Assessing Competencies in Construction TVET Programmes (Research question 2)	Written and theoretical examinations	"Most of the assessments still rely heavily on written examinations, which mainly test theoretical knowledge." (TVET Educator, P4)
		Practical workshop assessments	"Practical assessments in the workshop are used to evaluate whether students can actually perform construction tasks." (TVET Educator, P2)
		Project-based learning	"Students are sometimes required to complete construction-related projects that demonstrate their understanding of building processes." (TVET Educator, P6)
		Industrial training evaluation	"During industrial training, supervisors usually assess students based on their performance and attitude on site." (TVET Educator, P5)

3	Industry Perspectives on Certification of TVET Competencies (Research question 3)	Certification–competence gap	"Certificates do not always reflect the real skills of graduates; sometimes they still require significant training when they come to the site." (Industry Professional, P8)
		Employer skepticism toward certificates	"Many employers prefer to test graduates practically before assigning them important responsibilities." (Industry Professional, P11)
		Need for industry participation in certification	"Industry professionals should be involved in evaluating students' competencies because we understand the practical requirements of the job." (Industry Professional, P10)
4	Challenges in Assessing and Certifying Lifelong Learning Competencies (Research question 4)	Limited facilities and resources	"Some institutions lack modern equipment, which makes it difficult to train students using current construction technologies." (Industry Professional, P6)
		Weak industry–institution collaboration	"There is limited interaction between training institutions and construction companies when it comes to assessment and certification." (Industry Professional, P9)
		Outdated assessment methods	"Many assessments focus on theory instead of evaluating students' ability to solve real construction problems." (TVET Educator, P4)
		Institutional and policy constraints	"Institutional policies sometimes make it difficult to introduce more practical and industry-driven assessment approaches." (TVET Educator, P3)
5	Strategies for Strengthening Industry–Academia Collaboration (Research question 5)	Joint curriculum development	"Industry experts should contribute to curriculum development so that training reflects current construction practices." (Industry Professional, P14)
		Industry participation in student assessment	"Professionals from construction companies can participate in practical examinations or project evaluations." (Industry Professional, P10)
		Expansion of internship and apprenticeship programmes	"Students should spend more time on construction sites through internships and apprenticeship programmes." (Industry Professional, P11)
		Competency-based certification systems	"Certification should be based on demonstrated competencies rather than only theoretical examinations." (Industry Professional, P13)

Outline of Findings

The thematic analysis of interviews with TVET educators and construction industry professionals produced five major findings concerning the assessment and certification of lifelong learning competencies in construction-related TVET programmes in Nigeria. First, participants demonstrated a shared understanding of lifelong learning competencies as involving continuous professional development, adaptability to technological and industry changes, self-directed learning, problem-solving, and critical thinking. Second, the findings showed that assessment practices comprise written and theoretical examinations, practical workshop assessments, project-based learning, and industrial training evaluation, although greater emphasis is placed on theoretical examinations. Third, industry

professionals identified a gap between TVET certification and demonstrated workplace competence, noting that certificates do not always provide sufficient evidence of graduates' practical capabilities and advocating greater industry participation in certification. Fourth, the study identified limited training facilities and resources, weak industry–institution collaboration, outdated assessment methods, and institutional and policy constraints as major challenges to the effective assessment and certification of lifelong learning competencies. Fifth, participants proposed joint curriculum development, greater industry participation in student assessment, expanded internship and apprenticeship opportunities, and competency-based certification systems as strategies for strengthening industry–academia collaboration and improving the relevance of TVET assessment and certification.

Overall, these findings indicate that although lifelong learning competencies are recognised as important by both TVET educators and construction industry professionals, their assessment and certification remain insufficiently aligned with workplace requirements.

Discussion of Findings

The findings of this study highlight that both TVET educators and construction industry professionals share a strong understanding of lifelong learning as a continuous process of updating skills, adapting to technological change, and developing problem-solving and self-directed learning abilities. This result aligns with the view that modern TVET must prepare learners for continuous competence development rather than static occupational skills, as emphasized by the UNESCO which argues that lifelong learning competencies such as adaptability, collaboration, and critical thinking are essential for employability in rapidly evolving industries (UNESCO, 2022). Similarly, the emphasis participants placed on adaptability and continuous professional development reflects global perspectives that construction professionals must continually upgrade their competencies due to innovations in materials, digital technologies, and project delivery systems (ILO, 2019). However, the study also revealed a disconnect between stakeholders' recognition of lifelong learning competencies and their systematic integration into TVET assessment practices, as assessment remains largely dominated by theoretical examinations. This finding supports previous research indicating that many TVET systems in developing countries still prioritize knowledge-based testing rather than competency-based assessment approaches that capture practical and behavioural skills (Okoye & Arimonu, 2016). In contrast, competency-based education literature advocates for performance-oriented assessment methods such as project work, workplace evaluation, and portfolio assessment to effectively measure practical competencies and lifelong learning skills (Mulder, 2017). The study further found that TVET certificates are often perceived by industry professionals as evidence of programme completion rather than reliable indicators of workplace competence, leading employers to rely on informal workplace assessments during recruitment. This observation is consistent with research by Auta and Onwusuru (2022), which reported that employers in Nigeria frequently question the practical readiness of TVET graduates due to gaps between training outcomes and workplace expectations. Nonetheless, this perception differs slightly from findings in countries with stronger industry–TVET partnerships, where certification frameworks are jointly developed with industry and therefore carry higher credibility (Raelin, 2008); the difference may be attributed to weaker institutional collaboration structures and limited employer involvement in curriculum design within the Nigerian context. Additionally, the study identified structural barriers such as inadequate training facilities and limited industry participation in assessment processes, which restrict the effective development and evaluation of lifelong learning competencies. This finding agrees with earlier studies that attribute the persistent skills mismatch in Nigerian TVET partly to insufficient infrastructure and weak industry linkages (Akinola et al., 2020; Agbo & Nnajiofor, 2023). Finally, participants' recommendations for strengthening industry collaboration, expanding internship opportunities, and adopting competency-based certification frameworks are consistent with international TVET reform strategies that advocate stronger workplace learning and industry participation in assessment systems to ensure graduates possess both technical proficiency and transferable lifelong learning competencies (UNESCO, 2015; Mulder, 2017).

Conclusion

This study examined industry–academia perspectives on the assessment and certification of lifelong learning competencies within construction-related TVET programmes in Nigeria. The findings demonstrate that both TVET educators and construction industry professionals recognize lifelong learning competencies, such as adaptability, problem-solving, collaboration, and continuous professional development, as essential for preparing graduates for the dynamic nature of the construction sector. However, the study revealed a clear gap between this recognition and the actual practices used in assessing and certifying these competencies within TVET programmes. Assessment processes remain largely dominated by theoretical examinations, which inadequately capture the practical and transferable skills required in modern construction workplaces. In addition, industry stakeholders often perceive TVET certificates as indicators of programme completion rather than reliable evidence of workplace competence, leading employers to rely on additional workplace evaluations to determine graduates' readiness. The findings further highlight structural challenges, including limited industry involvement in assessment processes, inadequate training facilities, and weak collaboration between training institutions and construction organizations. These issues contribute to the persistent mismatch between training outcomes and industry expectations. Consequently, the study concludes that strengthening industry–academia collaboration is critical for improving the credibility and effectiveness of TVET certification in Nigeria. Greater industry participation in curriculum design, assessment, and certification processes, alongside the adoption of competency-based assessment methods such as workplace learning, project-based evaluation, and internship-based assessment, would enhance the accurate measurement of lifelong learning competencies. Addressing these gaps will help ensure that construction-related TVET programmes produce graduates who are not only technically skilled but also capable of continuous learning and adaptation throughout their professional careers.

Recommendations

Based on the findings of this study, the following recommendations are proposed to strengthen the assessment and certification of lifelong learning competencies in construction-related TVET programmes in Nigeria.

1) TVET institutions should adopt competency-based assessment approaches that measure both technical knowledge and transferable competencies, including problem-solving, adaptability, teamwork, and self-directed learning.
2) Stronger collaboration between TVET institutions and construction industry stakeholders should be established in the design and implementation of assessment and certification systems. Industry professionals should be actively involved in developing competency standards, participating in student assessments, and validating certification outcomes. Such collaboration would ensure that assessment criteria reflect the realities of contemporary construction practice and labour market expectations.
3) Policy makers and regulatory bodies should develop standardized frameworks and guidelines for assessing lifelong learning competencies within TVET programmes. Establishing national competency standards for construction-related occupations would provide clear benchmarks for institutions and ensure consistency in the evaluation and certification of graduates across different training providers.
4) TVET institutions should expand and strengthen structured internship, apprenticeship, and industrial training programmes. Extended workplace learning opportunities would enable students to develop and demonstrate lifelong learning competencies in real construction environments while allowing industry supervisors to contribute to the assessment of learners' performance.
5) There is a need for improved investment in training facilities, tools, and modern construction technologies within TVET institutions. Access to up-to-date equipment and digital construction technologies would enhance the authenticity of practical training and enable students to develop competencies that align with evolving industry practices.

6) Continuous professional development programmes should be provided for TVET educators to enhance their capacity to design and implement competency-based assessments. Training lecturers in modern pedagogical and assessment strategies will improve their ability to evaluate lifelong learning competencies effectively and support students in developing skills required for long-term professional growth.

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