



From Community Engagement to Career Readiness: The Role of Micro-Credentials in Enhancing Graduate Employability

Samson Abayomi Ojo^{1,2}, Opeyemi Tolulope Odewale² and Dumazi Samuel Khoza¹

Odewale Opeyemi Tolulope (opeyemi.odewale@unn.edu.ng)

¹ Department of Technology & Vocational Education, Faculty of Humanities, Tshwane University of Technology, Pretoria, South Africa

² Department of Industrial Technical Education, Faculty of Vocational & Technical Education, University of Nigeria, Nsukka

Abstract

This study explored undergraduate students' and community partners' perceptions of the value of micro-credentials within community-engaged Work-Integrated Learning (WIL) in technical education programs in South-East Nigeria. Guided by Experiential Learning Theory, Human Capital Theory, and Signaling Theory, the study adopted a mixed-methods exploratory design to examine how micro-credentials were perceived in relation to employability-related competencies, professional confidence, and career readiness. Quantitative data were collected through a structured questionnaire administered to 412 undergraduate students enrolled in technical education programs incorporating community-engaged WIL, while qualitative data were generated through semi-structured interviews with 20 students and 12 community partners involved in WIL supervision and collaboration. Findings revealed generally positive student perceptions regarding the usefulness of micro-credentials for recognising competencies developed through experiential learning, strengthening confidence in communicating skills, and supporting preparedness for future employment. Qualitative findings further suggested that students viewed micro-credentials as useful for documenting technical and transferable competencies, encouraging reflective learning, and articulating skills gained through community-engaged experiences. Community partners similarly perceived micro-credentials as potentially valuable indicators of students' preparedness and engagement within collaborative projects. However, participants identified institutional and contextual constraints, including limited awareness, inconsistent implementation, inadequate guidance, and weak digital infrastructure. The study suggests that micro-credentials may serve as useful mechanisms for recognising and communicating learning developed through community-engaged WIL while highlighting the need for stronger institutional support and clearer implementation strategies.

Keywords

micro-credentials, work-integrated learning, community-engaged learning, employability, career readiness, technical education, experiential learning, higher education.

Introduction

Work-Integrated Learning (WIL) has become an increasingly important feature of higher education, particularly in programs designed to prepare students for professional practice. Broadly understood as structured learning experiences that integrate academic study with workplace or community-based

settings, WIL seeks to bridge the longstanding gap between classroom knowledge and its practical application (O'Donovan, 2018; Okolie et al., 2020). Through activities such as internships, industrial attachments, service-learning, cooperative education, and community-based projects, students are provided opportunities to apply disciplinary knowledge in authentic contexts while developing professional and transferable capabilities. Existing research suggests that participation in WIL is often associated with students' perceptions of improved communication, problem-solving, adaptability, and preparedness for future work (Chukwuedo & Ementa, 2022; Dwyer et al., 2025; Ojo et al., 2025).

Contemporary understandings of WIL extend beyond the development of individual skills to emphasise its relational and collaborative nature. Rather than functioning solely as workplace exposure, WIL is increasingly recognised as a partnership-based pedagogical approach involving reciprocal engagement among universities, students, and external stakeholders, including industries, employers, and local communities (Jacoby et al., 2024; Okolie, Elom et al., 2021). Within this triadic arrangement, universities act not merely as providers of placement opportunities but also as pedagogical and relational actors responsible for designing learning experiences, supporting reflective practice, and facilitating meaningful connections between disciplinary learning and professional or community contexts. Community and industry partners, in turn, contribute situated expertise and authentic learning environments, while students actively engage in applying and negotiating knowledge through practice.

This relational dimension is particularly important within community-engaged WIL, where learning extends beyond employability preparation to include forms of reciprocal value creation, civic engagement, and context-responsive problem-solving. Community-engaged WIL refers to forms of experiential learning that intentionally connect students, universities, and community or workplace partners in mutually beneficial ways through shared projects, practical engagement, and applied knowledge exchange (Jacoby et al., 2024; Okolie, 2022). In such settings, learning is often collaborative, socially situated, and shaped by local realities. Consequently, student learning outcomes emerge not only from technical task completion but also through interactions with institutional structures, workplace practices, and community expectations.

These dynamics are especially relevant in technical education programs, where practical competence and workplace readiness form central curriculum objectives. In the context of this study, technical education programs refer to university-based fields oriented toward applied technological, vocational, engineering-related, and industrial skill development, including programs designed to prepare students for technical occupations, innovation, and workforce participation (Okolie, Nwali et al., 2021; Tennant et al., 2018). Such programs were selected because they commonly embed WIL as a core pedagogical component and place strong emphasis on applied problem-solving, practical competence, and industry or community engagement. Graduates are expected to demonstrate not only disciplinary knowledge but also the capacity to adapt, collaborate, and apply technical expertise in complex professional settings (Buck, 2024; Jackson & Edgar, 2019).

At the same time, concerns remain regarding how competencies developed through WIL are recognised and communicated. Many capabilities acquired through experiential and community-engaged learning, including teamwork, initiative, problem-solving, and professional confidence, often remain implicit or insufficiently documented within conventional degree structures (Biggs, 1999; Harris-Reeves et al., 2023). As labour markets increasingly value evidence of applied capability alongside academic qualifications, higher education institutions face growing pressure to better recognise and communicate students' learning gained through authentic practice settings (Rajabalee, 2023; Waddill, 2023; Wahab et al., 2025).

Micro-credentials have emerged as one response to this challenge. Commonly described as short, targeted, and quality-assured certifications, micro-credentials are intended to make specific competencies more visible, verifiable, and portable beyond traditional transcripts (Tamoliune et al., 2023; Vasilev, 2024). Within WIL settings, they may provide a mechanism for recognising discrete

technical and transferable competencies developed through practical experience. Research increasingly suggests that students, educators, and employers often perceive micro-credentials as useful for communicating skill attainment and supporting transitions into employment, although questions remain regarding consistency, standardisation, employer recognition, and contextual relevance across higher education systems (Rami et al., 2024; Wadhawan & Wadhawan, 2024).

Despite increasing attention to both micro-credentials and WIL, limited empirical research has examined how micro-credentialing is perceived within community-engaged WIL environments, particularly in technical education contexts and within developing higher education systems. Existing studies frequently emphasise employability discourse, digital credentialing systems, or institutional innovation, while giving less attention to how students and external partners experience the value of micro-credentials in documenting workplace and community-based learning (Damaševičius, 2024; Pandya & Wang, 2024). Furthermore, the role of universities in shaping these learning relationships and supporting meaningful recognition practices remains underexplored.

This gap is particularly evident in South-East Nigeria, where universities offering technical education increasingly incorporate industrial training, community-based placements, and service-oriented WIL experiences as part of efforts to improve workforce preparation and respond to local development needs (Ugwuozor & Egenti, 2024; Uwakwe et al., 2022; Oguejiofor et al., 2022). Through these experiences, students may acquire a range of technical, professional, and interpersonal competencies. However, questions remain regarding how such learning is recognised, communicated, and perceived to contribute to career preparedness within contexts where formal systems for documenting experiential learning are still emerging.

Against this background, the present study explores students' and community partners' perceptions of the value of micro-credentials within community-engaged WIL among undergraduate students enrolled in technical education programs in South-East Nigeria. Specifically, the study examines perceptions regarding how micro-credentials may support the communication of employability-related competencies, professional confidence, and career readiness developed through WIL experiences. It also explores how community partners perceive the relevance of micro-credentialed learning and identifies contextual and institutional factors shaping the implementation of micro-credentialing within technical education programs.

Literature Review

Work-Integrated Learning (WIL), Community Engagement, and Higher Education Partnerships

Work-Integrated Learning (WIL) is widely understood as an approach that links academic learning with workplace and community-based practice. Through internships, industrial training, practicum, cooperative education, and service-learning, students apply disciplinary knowledge in authentic settings while engaging with professional practice (O'Donovan, 2018; Okolie, 2022; Tennant et al., 2018). WIL is commonly associated with the development of transferable competencies, including communication, teamwork, problem-solving, adaptability, and technical skills linked to graduate preparedness for work (Dwyer et al., 2025; Okolie et al., 2020; Uwakwe et al., 2022).

Recent scholarship increasingly conceptualises WIL as a partnership-based process rather than workplace exposure alone. Community-engaged WIL particularly emphasises reciprocal relationships among universities, students, industries, and community organisations (Jacoby et al., 2024; Okolie, Nwali et al., 2021). Universities shape learning through curriculum design, supervision, assessment, and reflection, while community partners provide authentic contexts for practice and students construct understanding through participation in real-world activities.

Community engagement broadens WIL beyond workforce preparation by promoting civic participation, reciprocal learning, and problem-solving responsive to local needs (Chukwuedo &

Ementa, 2022; Otermans et al., 2023). However, concerns remain regarding how competencies developed through community-engaged WIL are recognised and communicated, particularly where institutional systems for documenting experiential learning are weak (Jacoby et al., 2024; Waddill, 2023).

Employability and Career Readiness Employability and Career Readiness in WIL Contexts

Employability extends beyond job attainment to include graduates' ability to adapt to changing labour market demands, sustain professional growth, and respond to workplace expectations (Alvarez et al., 2017; Chen et al., 2023; Wahab et al., 2025). It encompasses technical competence, transferable skills, professional confidence, and workplace awareness (Damaševičius, 2024; Greenwood, 2025; Ojo et al., 2022). Closely related, career readiness reflects students' perceived preparedness to communicate competencies and navigate professional transitions.

Research suggests that students value WIL for opportunities to apply knowledge, engage with professionals, and develop workplace capabilities (Okolie, Elom et al., 2021; Uwakwe et al., 2022). Community-engaged WIL may strengthen these experiences through collaborative and socially situated learning. However, reliance on self-reported data limits conclusions regarding actual employability outcomes, creating a need for studies exploring how students and external stakeholders perceive the contribution of experiential learning to confidence and career readiness.

A continuing challenge concerns documenting competencies gained through WIL. Interpersonal, collaborative, and context-specific skills are often insufficiently represented within conventional credentialing systems, limiting students' ability to communicate these competencies to employers (Chaurasia & Veeriah, 2023; Harris-Reeves et al., 2023).

Micro-Credentials as Recognition Mechanisms in Community-Engaged WIL

Micro-credentials have gained attention as mechanisms for recognising competencies acquired through formal, informal, and experiential learning. Typically awarded for demonstrated achievement in targeted skill areas, they complement traditional qualifications by making learning more visible, portable, and verifiable (Tamoliune et al., 2023; Vasilev, 2024). Within higher education, they are increasingly explored as tools for recognising technical skills, transferable competencies, and workplace learning not fully captured in conventional transcripts (Gamage & Dehideniya, 2025; Nguyen et al., 2025).

Their relevance is particularly evident in community-engaged WIL, where learning develops through interactions among students, universities, and external partners. Micro-credentials may provide structured recognition of competencies emerging from authentic practice, including teamwork, initiative, problem-solving, and professional engagement. Although students and employers often view micro-credentials as useful indicators of competence, concerns remain regarding standardisation, consistency, and employer recognition (Rami et al., 2024; Wadhawan & Wadhawan, 2024).

Despite growing interest, limited research has examined how micro-credentials are experienced within community-engaged WIL, particularly from multiple stakeholder perspectives. Existing studies largely focus on institutional reform and labour market alignment while giving less attention to how students, universities, and community partners interpret the value of credentialed experiential learning (Jacoby et al., 2024; Chukwu et al., 2024; O'Connor, 2024).

Technical Education Programs and the South-East Nigerian Context

Technical education programs prepare students for occupations requiring applied technical competence and workplace responsiveness. In this study, technical education refers to university-based disciplines emphasising technological, vocational, industrial, and engineering-related learning, where theoretical instruction is integrated with practical skill development (Chukwu et al., 2024; Tennant et al., 2018). These programs are relevant because WIL is commonly embedded through industrial training, fieldwork, service-learning, and community-based placements.

In South-East Nigeria, universities increasingly rely on WIL to strengthen graduate preparedness and address workforce and community development priorities (Ugwuozor & Egenti, 2024; Uwakwe et al., 2022; Oguejiofor et al., 2022). However, limited infrastructure, inadequate supervision, and weak systems for documenting experiential learning may constrain recognition of competencies developed through WIL (Okolie, 2022). These conditions make the context appropriate for examining perceptions of micro-credentials within community-engaged WIL.

Synthesis and Research Gap

Existing scholarship highlights the value of WIL, community-engaged learning, and micro-credentials in higher education. However, these areas are rarely examined together, particularly in technical education and developing-country contexts. Research often considers employability, WIL, or micro-credentials separately while giving limited attention to the interconnected roles of universities and community partners in shaping experiential learning.

Evidence also remains limited regarding how students and community stakeholders perceive micro-credentials as tools for recognising competencies developed through community-engaged WIL. Addressing this gap, the present study examines perceptions of the value of micro-credentials in supporting employability-related competencies, professional confidence, and career readiness among undergraduate students engaged in community-based WIL in South-East Nigeria.

Theoretical Framework

This study draws on Experiential Learning Theory (ELT), Human Capital Theory (HCT), and Signaling Theory to examine how students, universities, and community partners perceive the role of micro-credentials within community-engaged Work-Integrated Learning (WIL) in technical education programs in South-East Nigeria. Rather than assuming direct employability outcomes, these theories provide an interpretive lens for understanding how competencies developed through community-based learning are experienced, recognised, and communicated. Together, they frame community-engaged WIL as a relational process involving students, universities, and external partners whose interactions shape learning and perceptions of career readiness.

Experiential Learning Theory

Experiential Learning Theory (ELT), developed by Kolb (1984), explains learning as a cyclical process involving experience, reflection, conceptualisation, and application. Learning becomes meaningful when individuals engage in authentic activities, reflect on experiences, and apply new understanding in subsequent contexts (Okolie et al., 2020).

ELT provides a useful lens for understanding learning within community-engaged WIL in technical education, where industrial training, service-learning, field practice, and community placements are central pedagogical components. Competencies linked to career readiness emerge through authentic participation supported by supervision, feedback, and reflection. Universities contribute through curriculum design, assessment, and reflective support, while community partners provide contexts where learning is negotiated and applied.

Within this study, ELT helps explain how participants perceive the contribution of community-engaged WIL to skill development, professional confidence, and preparedness for work. However, the theory offers limited explanation of how competencies become formally recognised or communicated beyond learning settings, thereby informing the inclusion of Human Capital Theory.

Human Capital Theory

Human Capital Theory (HCT), associated with Becker (1964), conceptualises education and training as investments that develop knowledge, skills, and capabilities linked to productivity and professional opportunity. In higher education, the theory explains how educational experiences are perceived as valuable for career preparation.

In this study, HCT helps explain how students and universities may perceive micro-credentials as mechanisms for recognising competencies developed through community-engaged WIL. Rather than assuming experiential learning directly produces employability outcomes, the theory supports examination of how participants interpret the value of documenting practical and transferable skills gained through university-community engagement.

Within technical education, where applied competence is emphasised, micro-credentials may strengthen the visibility and communication of experiential learning. Universities play a central role through assessment, credentialing systems, and recognition of learning outcomes. However, while HCT explains educational value, it offers less insight into how credentialed competencies are interpreted by external stakeholders, justifying the use of Signaling Theory.

Signaling Theory

Signaling Theory, proposed by Spence (1973), explains how individuals communicate qualities such as competence, motivation, and preparedness through credible signals. Educational credentials frequently reduce uncertainty regarding an individual's capabilities.

In this study, micro-credentials are viewed as potential signals through which competencies developed during community-engaged WIL are communicated to external stakeholders. In technical education, where applied performance is valued, students may perceive micro-credentials as useful for demonstrating technical and transferable competencies acquired through experiential learning.

The theory also applies to community-engaged settings where credibility and preparedness shape interactions among universities, students, and partner organisations. Community partners may interpret micro-credentials as indicators of competence and engagement, while universities strengthen signal credibility through assessment and quality assurance.

Rather than assuming micro-credentials directly improve employability, Signaling Theory helps explain how participants perceive the communicative and symbolic value of credentialed learning.

Integrating the Theories with Study Constructs

ELT, HCT, and Signaling Theory collectively provide a complementary framework for examining perceptions of micro-credentials within community-engaged WIL. ELT explains how learning develops through experience and reflection; HCT highlights how such learning may be perceived as professionally valuable; and Signaling Theory explains how recognised competencies are communicated and interpreted across educational and community contexts.

Together, these perspectives position community-engaged WIL as a collaborative process involving students, universities, and community partners. The framework aligns with the exploratory design of the study by focusing on how participants interpret the role of micro-credentials in supporting perceived career readiness, professional confidence, and competency recognition in technical education settings.

Methodology

Research Design

The study employed a convergent mixed-methods design, combining quantitative and qualitative approaches to examine students' and community partners' perceptions of the value of micro-credentials embedded within community-engaged Work-Integrated Learning (WIL) in technical education programs in South-East Nigeria. The design was appropriate because the study focused on participants' experiences and interpretations of employability-related competencies, professional confidence, and career readiness rather than measuring objective employability outcomes or causal relationships. Quantitative data provided descriptive evidence of students' perceptions, while qualitative data offered contextual insight into how micro-credentialed WIL experiences were understood and experienced by students and community partners. Both strands were collected concurrently and integrated during interpretation to strengthen triangulation and contextual understanding.

Area of the Study

The study was conducted in South-East Nigeria, where public universities offer technical education programs with established WIL components linked to industries, schools, technical organisations, and community projects. In this study, technical education programs refer to university-based disciplines focused on vocational, industrial, engineering-related, and technology-oriented training that combine theoretical instruction with practical skill development. These programs were selected because community-engaged WIL forms a core pedagogical component through industrial training, service-learning, technical projects, and community placements aimed at preparing students for professional practice.

South-East Nigeria provided an appropriate setting because universities in the region increasingly rely on WIL to strengthen graduate preparedness and address local workforce and community needs, although systems for formally recognising competencies gained through experiential learning remain limited. While the findings are context-specific and not statistically generalisable, they may offer analytical insights transferable to similar higher education settings where technical education, experiential learning, and university-community partnerships intersect.

Population of the Study

The study population comprised undergraduate students enrolled in technical education programs in public universities in South-East Nigeria implementing community-engaged WIL, alongside community partners involved in student supervision and collaborative WIL activities. Institutional records indicated an estimated population of 480 eligible undergraduate students who had completed at least one community-engaged WIL placement. The study also involved an estimated 60 community partners, including supervisors, project coordinators, and organisational representatives supporting student placements.

Sample and Sampling Techniques

For the quantitative strand, the study adopted a census sampling approach to include all eligible students meeting the inclusion criteria. Census sampling was considered suitable because the target population was accessible and manageable, allowing broader representation and reduced sampling error (Creswell & Creswell, 2018). A total of 480 questionnaires were distributed, with 412 valid responses returned, yielding an 85.8% response rate.

For the qualitative strand, purposive sampling was used to select participants with direct and information-rich experience of community-engaged WIL and micro-credential use. Twenty students were selected based on prior involvement in micro-credentialed WIL activities and willingness to

reflect on their experiences. Additionally, twelve community partners were recruited because of their supervisory and collaborative roles in WIL projects involving technical education students. This approach enhanced the relevance and depth of qualitative evidence.

Research Instruments

Data were collected using two complementary instruments: a structured questionnaire for students and semi-structured interview guides for students and community partners. Both instruments were developed in line with the study objectives and contextualised to reflect community-engaged WIL practices in technical education programs.

The questionnaire contained two parts. Part I captured demographic and academic information, including programme area, year of study, participation in community-engaged WIL, and exposure to micro-credentials.

Part II comprised four sections. Section A examined students' perceptions of employability-related competencies developed through community-engaged WIL and recognised through micro-credentials. Items were adapted from employability literature and contextualised to technical education settings. Example items included: 'My community-engaged WIL experience helped me develop workplace-relevant skills' and 'The micro-credentials I earned reflect practical competencies valued in professional settings.'

Section B explored perceptions of professional confidence and preparedness associated with micro-credentialed WIL experiences. Drawing from career self-efficacy measures, items included: 'I feel confident explaining the skills I developed through WIL experiences' and 'Micro-credentials help me communicate my competencies more clearly.'

Section C focused on students' perceptions of feedback received from community partners during WIL experiences, particularly in relation to teamwork, initiative, problem-solving, and practical skill application. Consistent with the exploratory nature of the study, emphasis was placed on reported experiences rather than objective performance measures.

Section D assessed perceptions of institutional support for micro-credential implementation, including university guidance, supervision, policy support, and integration of micro-credentials into WIL practices. This section also examined the university's pedagogical and coordinating role in facilitating WIL activities and partnerships with external stakeholders.

All questionnaire items were measured using a five-point Likert scale, ranging from 1 = strongly disagree to 5 = strongly agree.

For the qualitative strand, semi-structured interview guides were developed for students and community partners. Student interviews explored experiences of community-engaged WIL, perceived value of micro-credentials, confidence in articulating competencies, and interactions with university and community stakeholders. Community partner interviews examined perceptions of students' preparedness, professionalism, skill application, and the usefulness of micro-credentials in recognising competencies developed through WIL participation.

Validity and Reliability of Research Instruments

Content and construct validity were established through adaptation of items from recognised employability and career development literature and expert review by five specialists in vocational and technical education, WIL, and educational measurement. The experts assessed item clarity, contextual relevance, and alignment with the study objectives. Their feedback informed revisions to wording, sequencing, and contextual suitability.

Reliability was determined through a pilot study involving 30 undergraduate students from comparable institutions outside the study area. Cronbach's alpha coefficients demonstrated strong

internal consistency across the instrument dimensions: Employability-Related Competencies ($\alpha = 0.88$), Professional Confidence and Career Readiness ($\alpha = 0.85$), Community-Partner Feedback and Engagement ($\alpha = 0.90$), and Institutional Support Structures ($\alpha = 0.82$). The overall reliability coefficient ($\alpha = 0.87$) indicated satisfactory reliability for the main study.

For the qualitative component, trustworthiness was strengthened through member checking, peer debriefing, and iterative coding review. Participants verified transcript accuracy, while an independent qualitative researcher reviewed coding consistency to enhance analytical credibility.

Data Collection Procedure

Data collection occurred over a ten-week period following ethical approval and institutional permissions from participating universities and relevant community organisations. Universities played an important coordinating role by facilitating access to eligible students, supervising WIL arrangements, and supporting communication with community partners.

Questionnaires were administered physically and electronically depending on institutional accessibility and participant preference. Semi-structured interviews were conducted face-to-face or online, audio-recorded with permission, and transcribed verbatim. Participation remained voluntary throughout, and confidentiality was assured.

Data Analysis

Quantitative data were analysed using IBM SPSS Statistics (Version 26). Given the exploratory and perception-based nature of the study, analysis focused on descriptive statistics, including means and standard deviations, to summarise students' perceptions regarding competencies, confidence, institutional support, and the perceived role of micro-credentials in WIL experiences. Inferential claims regarding causal relationships or measurable employability outcomes were intentionally avoided.

Qualitative data were analysed using Braun and Clarke's (2006) thematic analysis procedure. Coding was conducted inductively, allowing themes to emerge from participants' descriptions of WIL experiences, university support, community engagement, skill articulation, and perceived value of micro-credentials. Quantitative and qualitative findings were integrated during interpretation to provide a richer understanding of how micro-credentials were experienced across university-community learning contexts.

Ethical Considerations

Ethical approval for this study was obtained from the Faculty of Vocational and Technical Education Research Ethics Committee, University of Nigeria, Nsukka (Ethics Approval No. UNN/FVTE/REC/2025/054). The study was conducted in accordance with the University's ethical guidelines for research involving human participants. Written informed consent was obtained from all participants before data collection, and participation was entirely voluntary. Participants were informed of their right to withdraw from the study at any stage without penalty. Anonymity and confidentiality were maintained throughout the research process, and all data were securely stored and used exclusively for academic and research purposes in accordance with the conditions of the ethics approval.

Results

This section presents findings from the quantitative and qualitative data. Five key findings emerged. First, students generally perceived micro-credentials as useful for recognising and communicating competencies gained through community-engaged WIL. Second, students reported positive perceptions of professional confidence and career readiness linked to micro-credentialed WIL experiences. Third, community partners viewed micro-credentials as useful indicators of students'

preparedness and engagement in projects. Fourth, participants identified institutional support, guidance, and infrastructure as important to implementation. Finally, qualitative findings highlighted the collaborative role of universities, students, and community partners in shaping WIL experiences.

Table 1: Demographic characteristics of student respondents (n = 412)

Demographic Variable	Category	Frequency (f)	Percentage (%)
Year of Study	Penultimate Year	198	48.1
	Final Year	214	51.9
Gender	Male	242	58.7
	Female	170	41.3
Participation in Community-Engaged WIL	Yes	412	100.0
	No	0	0.0
Exposure to Micro-Credentials	Yes	376	91.3
	No	36	8.7

Table 1 presents the demographic characteristics of the 412 student respondents. Participants were drawn from public universities offering technical education programs with community-engaged WIL, with near-equal representation across institutions. All respondents were enrolled in technical education programs and had participated in at least one community-engaged WIL experience. Final-year students accounted for 51.9% of respondents, while 48.1% were penultimate-year students. Male students represented 58.7% of the sample and females 41.3%. Most respondents (91.3%) reported prior exposure to micro-credentials related to WIL activities.

Table 2: Characteristics of WIL supervisory and community partnership participants (n = 12)

Demographic Variable	Category	Frequency (f)	Percentage (%)
Participant Role	University WIL Supervisors	7	58.3
	Community Project Coordinators	5	41.7
Years of Experience in WIL Supervision/Coordination	1–3 years	3	25.0
	4–6 years	5	41.7
	7 years and above	4	33.3
Gender	Male	8	66.7
	Female	4	33.3

Table 2 presents the characteristics of the 12 participants involved in community-engaged WIL supervision and coordination. The group comprised university WIL supervisors (58.3%) and community project coordinators (41.7%), reflecting both university and community perspectives. Most participants had four to six years of WIL-related experience (41.7%), while 33.3% had more than seven years and 25.0% had one to three years of experience. Male participants accounted for 66.7% of the sample and females 33.3%.

Table 3: Students' perceptions of employability skills development through micro-credentialed WIL (n = 412)

S/N	Item Statement	Mean	Std. Dev
1	My participation in WIL helped me develop skills relevant to the workplace	4.35	0.62
2	Micro-credentials reflect practical competencies valued by employers	4.22	0.71
3	I can clearly demonstrate my skills to potential employers	4.18	0.69
4	WIL experiences enhanced my problem-solving abilities	4.25	0.65
5	WIL improved my communication and teamwork skills	4.30	0.63
6	I have gained technical competencies applicable in professional settings	4.28	0.66
7	Micro-credentials provide evidence of my work readiness	4.20	0.72
8	I feel confident presenting my WIL experience in job applications	4.15	0.70

9	WIL helped me develop adaptability in diverse work contexts	4.23	0.64
10	My skills gained through WIL are recognised by external stakeholders	4.12	0.68
11	I am able to link theory learned in class to practical tasks	4.27	0.61
12	Micro-credentials validate my ability to perform specific tasks	4.19	0.67
Cluster Mean		4.23	0.66

Table 3 presents students' perceptions of the role of micro-credentials in enhancing employability skills. Overall, there was strong agreement, with a cluster mean of $\bar{X} = 4.23$. The highest-rated item, 'My participation in WIL helped me develop skills relevant to the workplace,' received $\bar{X} = 4.35$, highlighting the importance of authentic, community-engaged learning in practical skill development. Other items, such as 'I can link theory learned in class to practical tasks' ($\bar{X} = 4.27$) and 'WIL improved my communication and teamwork skills' ($\bar{X} = 4.30$), indicate that students perceive WIL as fostering both technical and soft skills, which are formally recognised through micro-credentials. The lowest-rated item, 'My skills gained through WIL are recognized by external stakeholders' ($\bar{X} = 4.12$), suggests that while students feel confident in their skills, broader external validation could be strengthened.

Qualitative findings corroborated these results. Students reported that micro-credentials provided tangible evidence of skills, making it easier to articulate competencies to potential employers. One student explained, 'Before micro-credentials, I could only tell employers about my experience. Now, I can show documented proof of my skills.' Community partners noted that micro-credentials allowed them to quickly identify students' competencies, with one stating, 'When students show their micro-credentials, we know immediately what skills they bring to the project.' These insights indicate that micro-credentials effectively translate experiential learning into demonstrable employability outcomes.

Table 4: Professional confidence and career readiness (n = 412)

S/N	Item Statement	Mean	Std. Dev
1	I am confident explaining the skills gained through WIL	4.05	0.68
2	Micro-credentials make me feel more prepared for graduate employment	4.12	0.66
3	I can effectively showcase my competencies in interviews	4.08	0.69
4	Micro-credentials increase my professional self-esteem	4.15	0.64
5	I feel ready to perform in real-world work contexts	4.09	0.67
6	I am confident in articulating transferable skills	4.06	0.70
7	Micro-credentials help me present a credible professional profile	4.10	0.65
8	I am motivated to pursue further career development	4.11	0.63
Cluster Mean		4.09	0.66

Table 4 summarises students' responses regarding professional confidence and career readiness. The cluster mean of $\bar{X} = 4.09$ shows that micro-credentials positively influence students' confidence and readiness to demonstrate their competencies. The highest-rated item, 'Micro-credentials increase my professional self-esteem,' scored $\bar{X} = 4.15$, suggesting that formal recognition directly strengthens self-assurance. Items such as 'I feel ready to perform in real-world work contexts' ($\bar{X} = 4.09$) and 'I am confident explaining the skills gained through WIL' ($\bar{X} = 4.05$) further highlight that micro-credentials empower students to articulate and present skills effectively.

Qualitative data reinforced these perceptions. Students emphasised that micro-credentials allowed them to communicate abilities more clearly and confidently. One student remarked, 'I can now talk about my skills without hesitation because my micro-credentials back them up,' while another added, 'Micro-credentials gave me the courage to attend job interviews and discuss what I can do.' These findings show that micro-credentials enhance both self-efficacy and professional preparedness.

Table 5: Community partner perceptions (n = 12)

S/N	Item Statement	Mean	Std. Dev
1	Students with micro-credentials apply skills effectively	4.42	0.52
2	Micro-credentials improve students' problem-solving in community projects	4.38	0.57
3	Micro-credentialed students demonstrate better teamwork	4.33	0.61
4	Micro-credentials make students more reliable contributors	4.30	0.63
5	Students can link classroom theory to community tasks	4.35	0.59
6	Micro-credentials help in evaluating student competence	4.28	0.60
7	Micro-credentialed students exhibit higher initiative	4.27	0.58
8	Students with micro-credentials communicate skills clearly	4.31	0.55
Cluster Mean		4.33	0.58

Table 5 presents community partners' views on students' effectiveness during WIL. The cluster mean of $\bar{X} = 4.33$ indicates strong agreement that micro-credentialed students perform effectively in practical tasks. The highest-rated item, 'Students with micro-credentials apply skills effectively,' received $\bar{X} = 4.42$, highlighting the signalling value of micro-credentials. Other items, such as 'Students can link classroom theory to community tasks' ($\bar{X} = 4.35$) and 'Students with micro-credentials communicate skills clearly' ($\bar{X} = 4.31$), suggest that micro-credentials enhance observable performance, initiative, and communication.

Qualitative evidence aligned with these perceptions. Community partners noted that students with micro-credentials were more self-directed and reliable. One partner explained, 'Students with micro-credentials understand what is expected and can deliver without constant guidance,' while another commented, 'Their documentation makes it easier to assign tasks according to demonstrated competencies.' These insights indicate that micro-credentials certify skills while improving practical application in community projects.

Table 6: Institutional and contextual support for micro-credentials (n = 412)

S/N	Item Statement	Mean	Std. Dev
1	My university provides guidance on integrating micro-credentials into WIL	3.85	0.75
2	There is adequate institutional support for micro-credentials	3.78	0.78
3	Staff are trained to support micro-credentialed students	3.70	0.82
4	Resources are available to facilitate micro-credentials	3.73	0.79
5	Awareness of micro-credentials among students is sufficient	3.80	0.74
6	Institutional recognition of micro-credentials is clear	3.77	0.76
Cluster Mean		3.77	0.77

Table 6 summarises students' perceptions of institutional and contextual support. The cluster mean of $\bar{X} = 3.77$ indicates moderate support and highlights areas for improvement. The highest-rated item, 'My university provides guidance on integrating micro-credentials into WIL,' scored $\bar{X} = 3.85$, showing that some guidance exists. However, items such as 'Staff are trained to support micro-credentialed students' ($\bar{X} = 3.70$) and 'Resources are available to facilitate micro-credentials' ($\bar{X} = 3.73$) indicate gaps in training, resources, and consistent implementation.

Qualitative findings provided additional insight. Students noted that guidance is inconsistent: 'Micro-credentials are new to many staff, so guidance is sometimes inconsistent.' Community partners highlighted the need for clear policies: 'We need clear policies to ensure these credentials are valued both in the university and externally.' These results suggest that while micro-credentials positively affect employability and confidence, institutional and contextual factors must be strengthened to ensure consistent implementation and recognition.

Discussion

The findings of this study provide insight into how undergraduate students in technical education programs and community partners perceive the role of micro-credentials within community-engaged Work-Integrated Learning (WIL) in South-East Nigeria. Rather than demonstrating direct employability outcomes, the study highlights how participants experienced and interpreted the value of micro-credentials in recognising competencies developed through WIL activities embedded within university-community partnerships. Across both quantitative and qualitative findings, micro-credentials were generally perceived as useful mechanisms for articulating competencies, strengthening confidence in communicating skills, and supporting the visibility of learning gained through community-engaged experiences.

One important finding concerns students' perceptions of employability-related skill articulation developed through community-engaged WIL. Students reported that micro-credentials helped them explain and present competencies developed through participation in community-based projects, industrial attachments, and service-oriented learning experiences. Interview data further suggested that students viewed micro-credentials as structured evidence that helped translate experiential learning into language that could be communicated more confidently to prospective employers and professional networks.

These findings can be interpreted through the lens of Experiential Learning Theory (Kolb, 1984), which conceptualises learning as a cyclical process involving experience, reflection, conceptualisation, and application. Within the context of community-engaged WIL, micro-credentials appeared to support reflective meaning-making by encouraging students to identify and communicate skills developed through authentic engagement with workplace and community challenges. Rather than functioning solely as digital badges or certifications, participants described micro-credentials as tools that helped make tacit learning more visible and understandable.

This interpretation aligns with Okolie (2022) and Runcieman (2022), who argue that experiential learning frameworks become more meaningful when structured opportunities for reflection and recognition are embedded within placement experiences. Similarly, Jackson and Edgar (2019) observed that students who document workplace learning more systematically often demonstrate stronger capacity to articulate professional capabilities. However, consistent with the study design, these findings should be interpreted as students' perceptions of value rather than objective evidence that micro-credentials improve employability or workplace performance.

Importantly, the findings also reinforce the relational and collaborative nature of community-engaged WIL. Student learning did not occur independently but emerged within interactions among universities, community organisations, and students. Community partners provided experiential contexts through which students engaged with practical problems, while universities acted as pedagogical coordinators responsible for designing placements, facilitating supervision, and recognising learning outcomes. This finding strengthens arguments in the WIL literature that employability-oriented learning is co-produced through partnerships rather than generated solely through individual student participation (Jacoby et al., 2024; Oguejiofor et al., 2022; Okolie et al., 2021). In this sense, micro-credentials may be understood not only as indicators of student achievement but also as relational artefacts emerging from university-community collaboration.

The study further found that students generally perceived micro-credentials as contributing positively to their confidence in presenting themselves professionally and discussing competencies gained during WIL participation. Participants frequently described feeling more prepared to explain their experiences and competencies to employers because their learning had been formally recognised. Qualitative findings suggested that recognition itself carried motivational significance, with students describing a stronger sense of preparedness and legitimacy when discussing their practical experiences.

From a Human Capital Theory perspective (Becker, 1964), this finding suggests that students may perceive micro-credentials as visible representations of competencies accumulated through educational participation. However, it is important to emphasise that the study does not establish whether micro-credentials actually improve career readiness or labour market outcomes. Rather, the findings indicate that participants experienced micro-credentials as psychologically and professionally valuable forms of recognition.

The present findings resonate with Álvarez et al. (2017), who found that formal acknowledgement of competencies may strengthen learners' confidence and professional self-perception. Similarly, Okolie et al. (2022) reported that structured WIL experiences supported by feedback mechanisms contributed to stronger perceptions of work preparedness among students. Within this study, formal recognition appeared to shape how students interpreted and communicated their experiences, reinforcing perceptions of professional identity formation.

Community partner perspectives also contributed important insight into how micro-credentials were interpreted within community-engaged WIL environments. Partners described students who possessed micro-credentials as appearing more intentional, organised, and aligned with project expectations. However, rather than interpreting this as evidence of objectively superior performance, the findings suggest that micro-credentials may function as communicative signals that shape stakeholder perceptions of preparedness and accountability.

This interpretation aligns with Signaling Theory (Spence, 1973), which explains how credentials communicate otherwise difficult-to-observe attributes such as competence and readiness. Within community-engaged WIL, micro-credentials appeared to help external stakeholders interpret students' learning experiences more clearly, particularly where competencies had been developed through complex, socially situated activities. Community partners frequently indicated that clearly documented learning outcomes strengthened trust and facilitated expectations regarding student participation in collaborative projects.

These findings also foreground the importance of the university as a pedagogical and relational actor within community-engaged WIL. The university's role extended beyond placement coordination to include curriculum alignment, reflective supervision, competency recognition, and mediation between student learning and community expectations. Where institutional guidance appeared weak or inconsistent, participants reported uncertainty regarding the purpose and practical relevance of micro-credentials. This finding suggests that successful implementation of micro-credentialing within WIL depends not only on student participation or community engagement but also on institutional capacity to support meaningful integration.

Institutional and contextual constraints emerged as another important theme. Students and community partners reported challenges related to limited awareness, inconsistent implementation, weak digital infrastructure, and uncertainty about the formal value of micro-credentials within degree structures. These findings are consistent with Rami et al., (2024) who stated that institutional readiness and policy coherence are central to effective micro-credential adoption. Similarly, Alenezi et al. (2024); Ojo et al., 2024 and Tamoliune et al. (2023) highlight how fragmented implementation may weaken the credibility and sustainability of micro-credential systems.

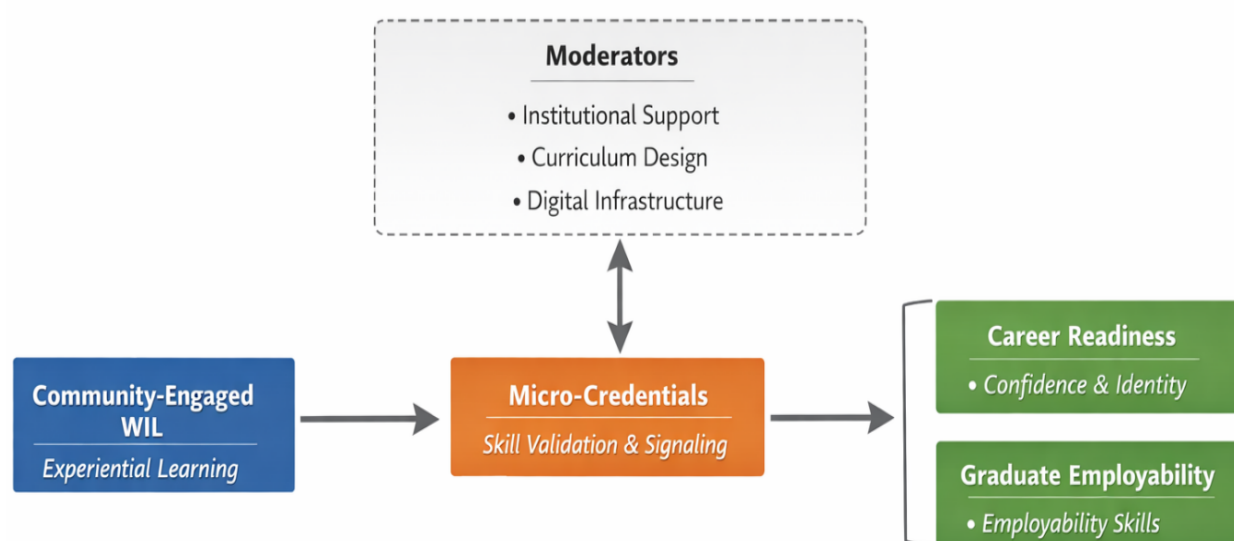
Taken together, the findings suggest that the perceived value of micro-credentials in community-engaged WIL is shaped by the interaction of multiple actors and contextual conditions. Students' perceptions of skill visibility and confidence, community partners' interpretations of preparedness, and institutional practices relating to recognition and support collectively shaped how micro-credentials were experienced. This reinforces the importance of viewing community-engaged WIL as a triadic relationship involving students, universities, and community partners rather than as an individual student experience alone.

Emergent Conceptualisation of Micro-Credentialed Community-Engaged WIL

Findings from this study suggest that community-engaged WIL is experienced as a collaborative process involving students, universities, and community partners. Universities supported learning through supervision, curriculum alignment, and competency recognition, while community partners provided authentic contexts for skill application. Participants generally perceived micro-credentials as useful for documenting and communicating competencies developed through experiential learning. Students and community partners described them as supporting skill visibility, confidence in articulation, and perceptions of preparedness. However, institutional support, guidance, and implementation conditions shaped these experiences.

Figure 1 presents an emergent conceptualisation of how university-community partnerships, experiential learning, and micro-credentials interact to support competency recognition and perceived career readiness within community-engaged WIL.

Figure 1: Emergent conceptualisation of micro-credentialed community-engaged WIL and perceived career readiness



Implications of the Findings

The findings suggest several implications for higher education institutions implementing community-engaged WIL within technical education programs. First, universities may benefit from strengthening institutional structures that support clearer integration of micro-credentials into WIL activities, including supervision, reflection, and competency documentation. Second, stronger collaboration between universities and community partners may improve alignment between learning objectives, community expectations, and recognised competencies. Third, because participants perceived micro-credentials as useful tools for communicating experiential learning, institutions may consider how digital recognition systems can complement traditional qualifications without replacing them.

Contributions to Knowledge

This study contributes to scholarship on WIL, employability, and micro-credentials in several ways. First, it extends understanding of how micro-credentials are perceived within community-engaged WIL in a developing-country context, particularly within undergraduate technical education programs in South-East Nigeria. Second, the study advances discussion beyond student-only perspectives by incorporating community partner experiences and highlighting the triadic relationship among students, universities, and community stakeholders. Third, it contributes theoretically by

demonstrating how Experiential Learning Theory, Human Capital Theory, and Signaling Theory collectively illuminate perceptions surrounding experiential recognition and professional identity formation. Finally, the study contributes contextually to emerging scholarship on digital credentialing in African higher education systems.

Limitations

Several limitations should be considered when interpreting the findings. First, the study relied substantially on self-reported perceptions collected through a cross-sectional design, meaning conclusions should be interpreted as participants' experiences and understandings rather than evidence of measurable employability improvement or career outcomes. Second, the study focused specifically on undergraduate students enrolled in technical education programs in public universities in South-East Nigeria, which may limit transferability to other disciplinary or institutional contexts. Third, although community partner perspectives were included, university actors such as WIL coordinators and faculty supervisors were not directly examined, representing an important area for future inquiry.

Directions for Future Research

Future research may benefit from longitudinal designs examining how perceptions of micro-credentials evolve over time and whether recognised competencies influence early-career transitions. Comparative studies involving different disciplines, institutional types, and regional settings could also clarify the conditions under which findings may be transferable. Further research incorporating university administrators, faculty supervisors, and employers would strengthen understanding of the triadic and institutional dynamics of community-engaged WIL. Finally, mixed-method and experimental studies may provide stronger evidence regarding the relationship between micro-credentialing, professional confidence, and longer-term employability outcomes.

Acknowledgements

The authors sincerely appreciate the undergraduate students, university Work-Integrated Learning (WIL) supervisors, and community project coordinators who participated in this study and generously shared their experiences and perspectives. The authors also acknowledge the participating universities and partner organisations in South-East Nigeria for facilitating access and supporting the conduct of this study.

Conflict of interest

All authors declare that they have no conflicts of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Statement on the use of Artificial Intelligence

No use of Artificial Intelligence was made at any point in this submission.

Contributions against CReDIT

SAO: Conceptualization; Methodology; Investigation; Data Curation; Formal Analysis; Writing – Original Draft; Writing – Review & Editing; Project Administration.

OOT: Validation; Investigation; Resources; Writing – Review & Editing.

KDS: Validation; Supervision; Writing – Review & Editing.

References

- Alenezi, M., Akour, M., & Alfawzan, L. (2024). Evolving microcredential strategies for enhancing employability: Employer and student perspectives. *Education Sciences*, 14(12), Article 1307. <https://doi.org/10.3390/educsci14121307>
- Alvarez, P., López Miguens, M. J., & Caballero, G. (2017). Perceived employability in university students: Developing an integrated model. *Career Development International*, 22(3), 280–299. <https://doi.org/10.1108/CDI-08-2016-0135>
- Becker, G. S. (1964). *Human capital: A theoretical and empirical analysis, with special reference to education*. University of Chicago Press
- Biggs, J. (1999). What the student does: Teaching for enhanced learning. *Higher Education Research & Development*, 18(1), 57–75. <https://doi.org/10.1080/0729436990180105>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Buck, A. (2024). Transdisciplinary employability practitioners: Engaging with skills for the future and redefining professional identity. *Journal of Teaching and Learning for Graduate Employability*, 15(2), 41–44. <https://doi.org/10.21153/jtlge2024vol15no2art2017>
- Chaurasia, D., & Veeriah, P. (2023). Skill development opportunities and its influence on employability of students. *Indian Journal of Vocational Education*, 35(1), 1–15. <https://psscive.ac.in/dvet/IJVE%2035-1Chapter.pdf>
- Chen, W., Shao, K., Xiao, Q., & Mai, Y. (2023). Development and validation of Chinese college students' future employability scale. *Frontiers in Psychology*, 14, 1063437. <https://doi.org/10.3389/fpsyg.2023.1063437>
- Chukwu, D. U, Omeje, H. O, Ojo, S. A., Okekpa, A. A., Nande, V. M. & Kechere, I. C. (2024). Industry Evolving Needs and TVET Institutional Offerings: A Qualitative Response to the On-Demand Skill Gap in Nigerian Woodwork Technology Institution. *International Journal of Vocational Education and Training Research*, 10(1), 1-7. <https://doi.org/10.11648/j.ijvetr.20241001.11>
- Chukwuendo, S. O., & Ementa, C. N. (2022). Students' work placement learning and employability nexus: Reflections from experiential learning and social cognitive career theories. *Industry and Higher Education*, 36(6), 742–755. <https://doi.org/10.1177/09504222221099198>
- Creswell, J. W & Creswell, J. D (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications
- Damaševičius, R. (2024). Commentary on artificial intelligence and graduate employability: What should we teach Generation AI? *Journal of Applied Learning and Teaching*, 7(2). <https://search.informit.org/doi/10.3316/informit.T2025091800011101642606763>
- Dwyer, N., Dempsey, N., Brown, D., & Watt, A. (2025). Employer perspectives on the importance of help-seeking as a key skill of higher education graduates. *Journal of Teaching and Learning for Graduate Employability*, 16(1), 1–17. <https://doi.org/10.21153/jtlge2025vol16no1art2015>
- Gamage, K. A. A., & Dehideniya, S. C. P. (2025). Unlocking career potential: How micro-credentials are revolutionising higher education and lifelong learning. *Education Sciences*, 15(5), Article 525. <https://doi.org/10.3390/educsci15050525>
- Greenwood, S. (2025). Using student conferences as a form of authentic assessment to develop and enhance transferable communication skills in quantitative and data-driven disciplines: Evidence from a postgraduate public health program. *Journal of Teaching and Learning for Graduate Employability*, 16(1), 18–38. <http://dx.doi.org/10.21153/jtlge2025vol16no1art2100>
- Harris-Reeves, B. E., Pearson, A. G., Vanderlelie, J. J., & Massa, H. M. (2023). The value of employability-focused assessment: Student perceptions of career readiness. *Journal of Teaching and Learning for Graduate Employability*, 14(1), 186–204. <https://doi.org/10.21153/jtlge2024vol15no1art1903>

- Jackson, D. A., & Edgar, S. (2019). Encouraging students to draw on work experiences when articulating achievements and capabilities to enhance employability. *Australian Journal of Career Development*, 28(1), 39–50. <https://doi.org/10.1177/1038416218790571>
- Jacoby, D., Savage, S., & Coady, Y. (2024). Remote possibilities: Where there is a WIL, is there a way? AI education for remote learners in a new era of work-integrated-learning. *Proceedings of the AAAI 2024 Spring Symposium Series*, 3(1), pp. 478-485. <https://doi.org/10.1609/aaaiss.v3i1.31261>
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice-Hall.
- Nguyen Thi Ngoc Ha, Van Dyke, N., & Spittle, M. (2025). Micro-credentials in higher education: Perceived benefits for graduate employability and interest levels in micro-credentials for training employability skills. *Studies in Higher Education*, 51(7), 1447-1459. <https://doi.org/10.1080/03075079.2025.2516709>
- O'Connor, M. (2024). Reconceptualising and supporting graduate employability practitioners for higher degree research candidates. *Journal of Teaching and Learning for Graduate Employability*, 15(2), 76–79. <http://dx.doi.org/10.21153/jtlge2024vol15no2art2043>
- O'Donovan, D. (2018). Bilateral benefits: Student experiences of work-based learning during work placement. *Industry and Higher Education*, 32(2), 119–128. <https://doi.org/10.1177/0950422218761273>
- Oguejiofor, V. I., Ogbonna, G. N., Nwafor, B. C., Eze, O. O., Ojo, S. A., Suleiman, I., Adebayo, T. F., & Odewale, O. T. (2022). Strategies for Scaling-up Educational Interventions in Technical and Vocational Education and Training (TVET) for Sustainable Development in Nigeria. *NeuroQuantology* 20(14), 543-549. <https://tinyurl.com/45629vds>
- Ojo, S. A., Anaele E. A. O., & Omeje H. O. (2022). An Investigation into the Soft skills required of Potential Building Graduate Employee for Sustainable Employment. *Journal of Management and Science*, 12(3) 71-85. <https://doi.org/10.26524/jms.12.48>
- Ojo, S. A., Ogbu, D. K., & Dalyop, G. B. (2025). Workplace Readiness Skills Needed by Graduates of Polytechnics for Employment in Construction Industries in Enugu State. *Journal of Home Economics Research*, 32(2), 183–196. <https://doi.org/10.66731/jher.v32i2.575>
- Ojo, S. A., Ujevbe, O. B., & Ogunjobi, O. P (2024). Assessing the Integration of ICT in Instructional Practices among TVET Lecturers in Enugu State Universities. *NAU Journal of Technology & Vocational Education*, 9(2), 93. <https://journals.unizik.edu.ng/index.php/nauijted/article/view/5144>
- Okolie, U. C. (2022). Work placement learning and students' readiness for school-to-work transition: Do perceived employability and faculty supervisor support matter? *Journal of Vocational Behavior*, 139. <https://doi.org/10.1016/j.jvb.2022.103805>
- Okolie, U. C., Elom, C. O., Onajite, G. O., Abonyi, S. O., & Igwe, P. A. (2021). Exploring the link between student placement learning in business organizations and self-employment preparatory behaviours. *Industry and Higher Education*, 36(6), 1–12. <https://doi.org/10.1177/09504222211057013>
- Okolie, U. C., Igwe, A. P., Nwosu, H. E., Mezieobi, K. C., Okorie, C., & Abonyi, S. O. (2020). Enhancing graduate employability: Why do higher education institutions have problems with teaching generic skills? *Policy Futures in Education*, 18(2), 294–313. <https://doi.org/10.1177/1478210319864824>
- Okolie, U. C., Mlanga, S., Nwosu, H. E., Mezieobi, K. C., Okorie, C., & Abonyi, S. O. (2022). Work placement supervisor support and students' proactive career behaviours: The moderating role of proactivity. *Journal of Career Development*, 50(1), 168–184. <https://doi.org/10.1177/08948453211073913>
- Okolie, U. C., Nwali, A. C., Ogbakirigwe, C. O., Ezemoyi, C. M., & Achilike, B. A. (2021). A closer look at how work placement learning influences student engagement in practical skills acquisition. *Higher Education Research & Development*, 41(7), 1–14. <https://doi.org/10.1080/07294360.2021.1996338>
- Otermans, P. C., Aditya, D., & Pereira, M. (2023). A study exploring soft skills in higher education. *Journal of Teaching and Learning for Graduate Employability*, 14(1), 136–153. <https://doi.org/10.21153/jtlge2023vol14no1art1665>
- Pandya, S. S., & Wang, J. (2024). Artificial intelligence in career development: A scoping review. *Human Resource Development International*, 27(3), 324–344. <https://doi.org/10.1080/13678868.2024.2336881>
- Rajabalee, Y.B. (2023). The implementation of micro-credentials in formal and informal learning: A systematic literature review. *International Journal of Learning and Teaching*, 9(4), 1–12. <https://doi.org/10.18178/ijlt.9.4.328-336>
- Rami, A., Ismail, I. A., Sarman, M. A. (2024). Readiness of higher education leaders to implement micro-credentials in Malaysia. *International Journal of Evaluation and Research in Education*, 13(6), 3983–3992. <https://doi.org/10.11591/ijere.v13i6.28220>
- Runcieman, A. (2022). Developing students' professional identities through work-integrated learning: 'Small story' research from an ethnographic perspective. *Journal of Education and Work*, 35(5), 559–571. <https://doi.org/10.1080/13639080.2022.2092604>

- Spence, M. (1973). Job market signaling. *Quarterly Journal of Economics*, 87(3), 355–374.
<https://doi.org/10.2307/1882010>
- Tamoliune, G., Greenspon, R., Tereseviciene, M., Volungeviciene, A., Trepule, E., & Dauksiene, E. (2023). Exploring the potential of micro-credentials: A systematic literature review. *Frontiers in Education*, 7.
<https://doi.org/10.3389/feduc.2022.1006811>
- Tennant, S., Murray, M., Gilmour, B., & Brown, L. (2018). Industrial work placement in higher education: A study of civil engineering student engagement. *Industry and Higher Education*, 32(2), 108–118.
<https://doi.org/10.1177/0950422218756384>
- Ugwuozor, F. O., & Egenti, M. C. (2024). Artificial intelligence and the future of work: Recent graduates' perspective. *Creative Artist: A Journal of Theatre and Media Studies*, 18(1), 1–19.
<https://www.ajol.info/index.php/cajtm/article/view/267136>
- Uwakwe, R. C., Okolie, U. C., Ehiobuche, C., Ochinanwata, C., & Idike, I. M. (2022). A multi-group study of psychological capital and job search behaviours among university graduates with and without work placement learning experience. *Journal of Career Assessment*, 31(2), 321–339.
<https://doi.org/10.1177/10690727221118376>
- Vasilev, I. (2024). A model of design and implementation of micro-credentials in TVET: A promising and flexible pathway to employment and skill development. *International Journal of Current Science Research and Review*, 7(12). <https://doi.org/10.47191/ijcsrr/V7-i12-18>
- Waddill, D. (2023, November 13-15). Applied learning strategy using technology to connect higher education students with workplace opportunities. ICERI2023 Proceedings: 16th annual International Conference of Education, Research and Innovation, Seville, Spain. <https://doi.org/10.21125/iceri.2023.1786>
- Wadhawan, K., & Wadhawan, D. (2024). The relevance of micro and macro credentials for the 21st-century workforce: A gateway for securing jobs. *Partners Universal International Research Journal*, 3(3)
<https://doi.org/10.5281/zenodo.13827494>
- Wahab, M. H. S., Hosen, M., Islam, M. A., Chowdhury, M. A. M., Jantan, A. H., & Wahab, S. A. (2025). Graduate employability: A bibliometric analysis. *Global Business and Organizational Excellence*, 44(2), 38–57.
<https://doi.org/10.1002/joe.22267>