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Digital Instructional Capacity as a Predictor of Skill Acquisition Outcomes in Technical and Vocational Education and Training Institutions in Nigeria.

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Abstract
This paper examined digital instructional capacity as a predictor of skill acquisition outcomes in Technical and Vocational Education and Training (TVET) institutions in Nigeria. This study was motivated by the persistent weak practical skill outcomes observed among TVET graduates. This study adopted a quantitative predictive research design in which the independent variables were the components of digital instructional capacity (workshop technology availability, teacher digital competence, curriculum–industry alignment, and simulation-based instructional use), while skill acquisition outcomes served as the dependent variable. The population comprised instructors and final-year students from government-owned TVET institutions in South-West Nigeria. A sample size of 215 respondents (65 instructors and 150 students) were selected using a multi-stage stratified random sampling technique. Data were collected using a validated structured questionnaire with a four-point Likert scale (4 = Strongly Agree, 3 = Agree, 2 = Disagree, 1 = Strongly Disagree) that measured the independent and dependent variables. The decision criterion was set at Mean ≥ 2.50 = Agree. The questionnaire was validated through three experts in Technical Education and Test and Measurement, and its reliability was established using Cronbach's alpha, yielding a coefficient of 0.82, indicating strong internal consistency. Descriptive results revealed low levels across all variables, as all grand means fell below the decision criterion of 2.50 (Mean ≥ 2.50 = Agree). Respondents disagreed on the availability of workshop technology (Grand Mean = 2.39), teacher digital competence (Grand Mean = 2.40), curriculum–industry alignment (Grand Mean = 2.34), simulation-based instructional use (Grand Mean = 2.33), and skill acquisition outcomes (Grand Mean = 2.23). Multivariate linear regression analysis showed a strong and statistically significant joint predictive relationship between the independent variables and the dependent variable ($R = 0.742$; $R^2 = 0.551$; Adjusted $R^2 = 0.543$; $p < 0.01$), explaining 55.1% of the variance in skill acquisition outcomes. The p-value was far below the 0.05 and 0.01 thresholds of significance, indicating high statistical significance at the 1% level. Individually, workshop technology availability ($\beta = 0.41$) and teacher digital competence ($\beta = 0.36$) emerged as the strongest predictors. The study concluded that skill acquisition outcomes in Nigerian TVET institutions were largely determined by effective digital instructional capacity. It recommended sustained investment in modern workshop infrastructure, strengthening of teacher digital competence, improved curriculum–industry alignment, and strategic integration of simulation-based instruction to enhance vocational training effectiveness in Nigeria.

Keywords: Digital Instructional Capacity, Skill Acquisition Outcomes, Technical and Vocational Education and Training.

1. Introduction

Technical and Vocational Education and Training plays a critical role in national development by equipping individuals with occupationally relevant skills required for productive employment and economic growth. UNESCO (2022) described TVET as an education and training system designed to develop applied

knowledge, technical competence, and professional skills aligned with labour market needs. Extending this global position to the Nigerian context, Okolie and Igwe (2021) argued that TVET functions as a strategic pathway for workforce development when skill outcomes are closely matched with industry requirements. From an Asian industrial perspective, Wang (2020) observed that contemporary TVET systems are increasingly evaluated based on graduates' technical competence and adaptability rather than certification alone. Together, these scholarly positions establish skill acquisition as the central indicator ofTVET effectiveness.

Skill acquisition represents the core outcome through which the success ofTVET programmes is assessed. Anderson (2018) defined skill acquisition as a progressive process in which learners move from conceptual understanding to fluent task performance through structured practice and feedback. Building on this cognitive foundation, Ayonmike (2020) maintained that skill acquisition in vocational education is best demonstrated through observable performance using appropriate tools, materials, and procedures rather than through learners' perceptions of competence. From a Southeast Asian perspective, Zainal and Yusof (2021) emphasised that meaningful skill acquisition occurs when learners are able to transfer learned competencies across varying contexts and problem situations. These viewpoints collectively underscore skill acquisition as a performance-based construct that requires instructional conditions capable of supporting both practice and transfer.

One instructional condition that strongly shapes skill acquisition in TVET is the availability of functional and industry-relevant workshop technology. Finch and Crunkilton (2018) argued that vocational skills cannot be effectively developed in training environments that lack equipment reflecting real workplace conditions, as such deficiencies weaken the authenticity of learning experiences. Supporting this argument empirically, Hamzah, Bakar, and Noor (2020) reported that students in Malaysian technical colleges achieved higher levels of procedural accuracy and confidence when trained with modern workshop facilities. Similarly, Li (2021) observed in the Chinese vocational system that graduates trained on obsolete machinery often struggled to adapt to contemporary industrial settings. These studies collectively indicate that workshop technology availability is not merely infrastructural but directly influences the quality and transferability of acquired skills.

However, the instructional value of workshop technology depends largely on the competence of teachers responsible for its integration into teaching and learning processes. Teacher digital competence therefore remains a crucial variable in modern TVET environments. Redecker (2017) defined teacher digital competence as the ability to use digital technologies pedagogically for instructional design, facilitation, and assessment. When this competence is weak, the benefits of technology are significantly reduced. In the Nigerian context, Olakulehin (2021) observed that many TVET instructors possessed strong technical trade skills but lacked the digital pedagogical capacity required to deploy instructional technologies effectively. Complementing this view from the United States, Trust and Whalen (2020) demonstrated that digitally competent teachers are better able to scaffold complex skill learning through visualisation, simulation, and adaptive feedback. These findings suggest that teacher digital competence mediates the relationship between instructional technology and skill acquisition outcomes.

Beyond instructional delivery and teacher capability, curriculum–industry alignment plays a decisive role in determining the relevance of skills acquired through TVET programmes. Curriculum–industry alignment refers to the extent to which training content reflects current industrial practices, tools, and competency standards. McGrath (2019) argued that persistent misalignment between vocational curricula and labour market needs remains a major contributor to graduate unemployability. In support of this position, Adebisi (2022) reported that limited industry involvement in curriculum design within Nigerian TVET institutions often results in graduates whose skills do not fully meet workplace expectations. From a European policy standpoint, Cedefop (2021) maintained that strong curriculum–industry alignment enhances employability and supports long-term occupational mobility by ensuring that skills remain relevant amidst technological change. These perspectives position curriculum alignment as a structural factor linking institutional training to economic outcomes.

In recent years, the instructional landscape of TVET has also been influenced by the increasing adoption of simulation-based instructional approaches. Simulation-based instruction involves the use of digital environments to replicate real-world technical tasks in safe and repeatable conditions. Lateef (2020) explained that simulation allows learners to practise complex or high-risk procedures without the constraints associated with physical workshops. This pedagogical advantage was supported by Alias, DeWitt, and Rahman (2019), who found that simulation-based learning improved learners' procedural accuracy and confidence before engaging in real workshop tasks. Similarly, Cook et al. (2021) demonstrated that simulation-enhanced instruction significantly improved skill retention and performance transfer in technical education contexts. These findings indicate that simulation-based instruction complements physical training by strengthening experiential learning opportunities.

Although workshop technology availability, teacher digital competence, curriculum–industry alignment, and simulation-based instructional use have been widely discussed in the literature, much of the existing research relies on descriptive approaches that report perceptions rather than quantify predictive relationships. Such methods provide useful insights but offer limited guidance on the relative contribution of instructional variables to skill acquisition outcomes. Creswell and Creswell (2023) argued that predictive analytical techniques, particularly multivariate regression models, are more appropriate for explaining educational outcomes because they estimate effect sizes and variance contributions. Similarly, Hair et al. (2022) emphasised that regression-based analysis enables researchers to identify the most influential predictors within complex educational systems.

Given the increasing expectations placed on TVET systems to deliver measurable and industry-relevant skills, there is a clear need for research that integrates multiple instructional variables into a single predictive framework. In response to this need, the present study adopts a multivariate linear regression approach to model the predictive effects of digital instructional capacity on skill acquisition outcomes in TVET institutions. The study seeks to generate

empirical evidence capable of informing instructional improvement, technology investment, and curriculum reform within vocational education systems.

2. Statement of the Problem

Despite perceived interventions in facilities, curriculum reforms, and policies, Technical and Vocational Education and Training (TVET) institutions in Nigeria continue to produce graduates whose practical skill competence falls below industry expectations. This persistent mismatch suggests that the problem is not merely the availability of resources, but the ineffective utilisation and integration of critical instructional components, including workshop technology, teacher digital competence, curriculum–industry alignment, and simulation-based instructional approaches.

Existing studies within the Nigerian context have largely focused on descriptive assessments of these factors in isolation, with limited empirical attention to how they interact to influence skill acquisition outcomes. Consequently, there is insufficient evidence on the relative and combined predictive power of these instructional variables, making it difficult to prioritise interventions that can meaningfully improve graduate competence.

This lack of predictive, model-based insight constitutes a critical gap in TVET research and practice in Nigeria. Without a clear understanding of which components of digital instructional capacity most strongly drive skill acquisition, ongoing reforms risk remaining fragmented, inefficient, and weakly aligned with industry needs.

3. Purpose of the Study

The general purpose of this study is to:

i. Examine the level of workshop technology availability in Nigerian Technical and Vocational Education and Training institutions.
ii. Determine the level of teacher digital competence in Nigerian Technical and Vocational Education and Training institutions.
iii. Assess the extent of curriculum–industry alignment in Nigerian Technical and Vocational Education and Training institutions.
iv. Examine the extent of simulation-based instructional use in Nigerian Technical and Vocational Education and Training institutions.
v. Determine the level of skill acquisition outcomes among students in Nigerian Technical and Vocational Education and Training institutions.

4. Research Questions

The following research questions guided the study;

i. What is the level of workshop technology availability in Nigerian Technical and Vocational Education and Training institutions?
ii. What is the level of teacher digital competence in Nigerian Technical and Vocational Education and Training institutions?
iii. What is the extent of curriculum–industry alignment in Nigerian Technical and Vocational Education and Training institutions?
iv. What is the extent of simulation-based instructional use in Nigerian Technical and Vocational Education and Training institutions?
v. What is the level of skill acquisition outcomes among students in Nigerian Technical and Vocational Education and Training institutions?

5. Research Hypotheses

The following null hypotheses were formulated to guide the study:

Hypothesis 1(Joint Contribution):

H_{01}: Digital instructional capacity variables (workshop technology availability, teacher digital competence, curriculum – industry alignment, and simulation- based instructional use) do not jointly and significantly predict skill acquisition outcomes in Nigerian Technical and Vocational Education and Training institutions

Hypothesis 2 (Relative Contribution):

H_{02}: Digital instructional capacity variables (workshop technology availability, teacher digital competence, curriculum – industry alignment, and simulation-based instructional use) do not individually and significantly predict skill acquisition outcomes in Nigerian Technical and Vocational Education and Training institutions.

6. Methodology

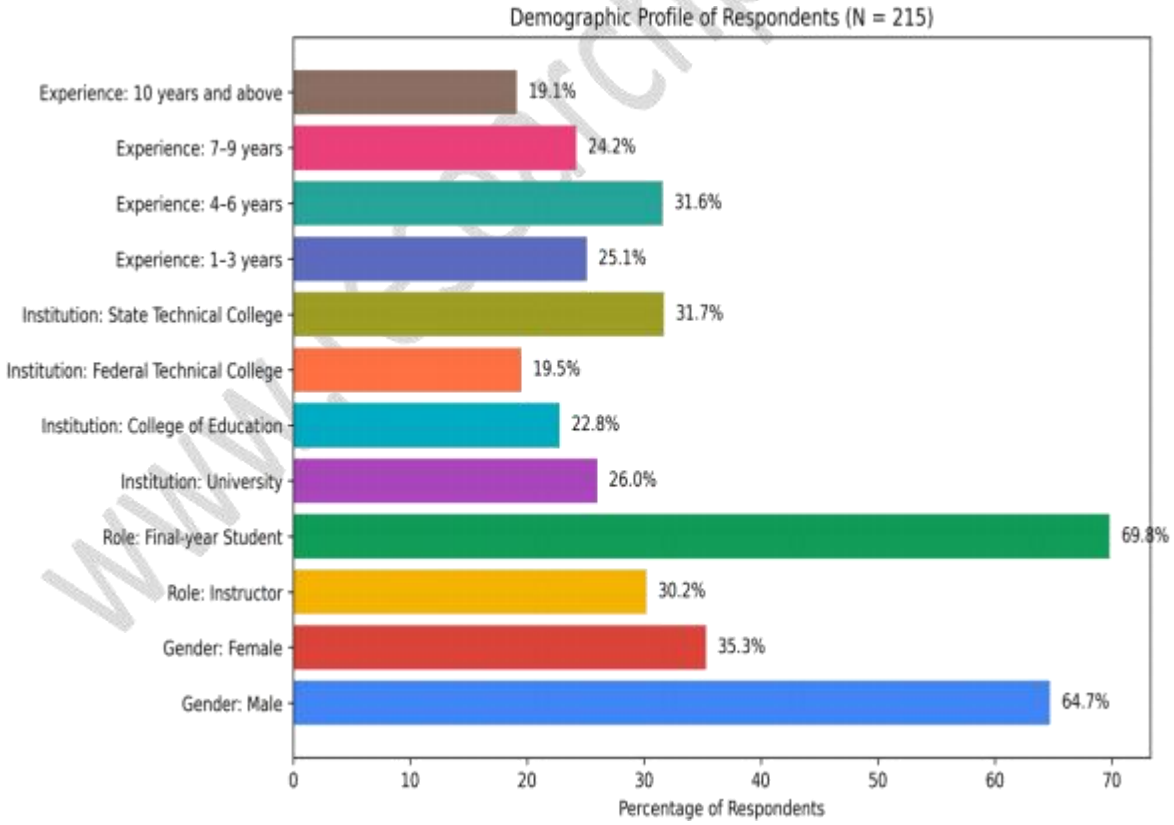
This study adopted a quantitative predictive research design. The population comprised instructors and final-year students in government-owned Technical and Vocational Education and Training (TVET) institutions in South-West Nigeria. A sample of 215 respondents (65 instructors and 150 students) were selected using a multi-stage stratified random sampling technique. Data were collected using a structured questionnaire measuring workshop technology availability, teacher digital competence, curriculum–industry alignment, simulation-based instructional use, and skill acquisition outcomes. The instrument was validated through expert review in Technical Education and Measurement and Evaluation to ensure content relevance and construct alignment. Reliability was established using Cronbach's alpha, yielding a reliability coefficient of 0.82, indicating high internal consistency. Data were analysed using descriptive statistics (mean and standard deviation) and multivariate linear regression at the 0.05 level of significance.

7. Results and Data Analysis

Table 1: Demographic Distribution

Demographic Variables	Category	Frequency	Percentage (%)
Gender	Male	139	64.7
	Female	76	35.3
Role	Instructor	65	30.2
	Final-year Student	150	69.8
Institution Type	University	56	26.0
	College of Education	49	22.8
	Federal Technical College	42	19.5
	State Technical College	68	31.7
State	Lagos	52	24.2
	Ogun	36	16.7
	Oyo	33	15.3
	Osun	31	14.4
	Ondo	38	17.7
	Ekiti	25	11.6
Experience	1–3 years	54	25.1
	4–6 years	68	31.6
	7–9 years	52	24.2
	10 years and above	41	19.1

Field Survey 2025



Field Survey 2025, Google Form.

The demographic profile indicates that the respondents were predominantly male and largely composed of final-year students, reflecting the typical structure of technical and vocational education programmes. The strong representation of technical colleges and students with moderate to high levels of experience suggests that the data were obtained from respondents who were actively engaged in practical skill training and instructional processes. This profile is appropriate for examining

digital instructional capacity and skill acquisition outcomes, as the respondents possessed sufficient exposure to workshop facilities, instructional technologies, and curriculum implementation across different TVET institutions in South-West Nigeria. The geographical spread across the six states further supports the relevance of the findings to the regional TVET context.

Descriptive Statistics by Research Questions

Scale: 4 = Strongyl Agree, 3 = Agree, 2 = Disagree, 1 = Strongyl Disagree
Decision criterion: Mean ≥ 2.50 =
Agree N = 215

Research Question 1

What is the level of workshop technology availability in Nigerian Technical and Vocational Education and Training institutions?

Table 2: Workshop Technology Availability

Code	Item Statements	Mean	SD	Decision
WTA1	Workshop machines are functional and available for students' practical training	2.62	0.89	Agree
WTA2	Students have regular access to modern tools for hands-on practice	2.31	0.93	Disagree
WTA3	Workshop equipment reflects current industry standards and technologies	2.28	0.94	Disagree
WTA4	Students can independently practice skills using available workshop facilities	2.35	0.92	Disagree
WTA5	Workshop tools are sufficient for repeated skill acquisition activities	2.40	0.91	Disagree
	Grand Mean	**2.39**		**Disagree**

Source: Field Survey 2025

The findings indicate a low level of workshop technology availability (Grand Mean = 2.39). Although students occasionally access functional machines (WTA1), the majority of indicators show inadequate availability of modern, industry-standard equipment. This suggests that workshop environments do not consistently support repeated practice, independent skill acquisition, or exposure to current industrial technologies. This finding aligns with Finch and Crunkilton (2018), who emphasized that vocational competence depends on authentic, industry-relevant training environments. Similarly, Hamzah, Bakar, and Noor (2020) found that inadequate workshop tools significantly reduce skill mastery, while Li (2021) reported that outdated equipment limits transfer of skills to real workplace settings.

Research Question 2

What is the level of teacher digital competence in Nigerian Technical and Vocational Education and Training institutions?

Table 3: Teacher Digital Competence

Code	Items	Mean	SD	Decision
TDC1	Teachers use digital tools to demonstrate practical tasks before workshop sessions	2.58	0.88	Agree
TDC2	Teachers integrate videos and simulations to explain technical procedures	2.34	0.91	Disagree
TDC3	Teachers use digital instruction to reduce students' practical errors	2.29	0.93	Disagree
TDC4	Teachers combine digital teaching with hands-on demonstration effectively	2.36	0.92	Disagree
TDC5	Teachers guide students using digital resources during skill practice	2.41	0.90	Disagree
	Grand Mean	**2.40**		**Disagree**

Source: Field Survey 2025

The results reveal a low level of teacher digital competence (Grand Mean = 2.40). While there is limited use of digital tools for demonstration (TDC1), most instructional practices do not effectively integrate digital pedagogy into skill training. This indicates that teachers are not fully equipped to use digital tools to enhance procedural understanding or reduce student errors.

This aligns with Redecker (2017), who defined digital competence as the ability to effectively integrate technology into pedagogy. Trust and Whalen (2020) found that digitally competent teachers significantly improve learning outcomes through structured instructional support. In Nigeria, Olakulehin (2021) similarly reported that weak digital skills among instructors reduce instructional effectiveness in technical education.

Research Question 3

What is the extent of curriculum–industry alignment in Nigerian Technical and Vocational Education and Training institutions?

Table 4: Curriculum–Industry Alignment

Code	Item Statements	Mean	SD	Decision
CIA1	TVET curriculum reflects current industry job requirements	2.46	0.90	Agree
CIA2	Practical training aligns with real workplace operations	2.33	0.92	Disagree

CIA3	Skills taught match industry expectations and standards	2.29	0.94	Disagree
CIA4	Curriculum prepares students for immediate employment without retraining	2.25	0.95	Disagree
CIA5	Industry partners actively contribute to curriculum design	2.37	0.91	Disagree
	Grand Mean	**2.34**		**Disagree**

Source: Field Survey 2025

The findings show a low extent of curriculum–industry alignment (Grand Mean = 2.34). Although there is partial reflection of industry requirements in curriculum documents (CIA1), most operational aspects remain weak. This indicates a disconnect between curriculum content and actual workplace demands, especially in employment readiness and industry collaboration. This supports McGrath (2019), who identified curriculum mismatch as a major constraint to employability. Adebisi (2022) noted weak industry participation in curriculum design in Nigeria, while Cedefop (2021) emphasized that strong alignment enhances occupational mobility and skill relevance.

Research Question 4 What is the extent of simulation-based instructional use in Nigerian Technical and Vocational Education and Training institutions?

Table 5: Simulation-Based Instruction

Code	Item Statements	Mean	SD	Decision
SBI1	Simulation tools are used to prepare students before workshop practice	2.31	0.97	Disagree
SBI2	Simulation improves understanding of technical procedures	2.38	0.95	Disagree
SBI3	Simulation reduces errors during practical training	2.26	0.98	Disagree
SBI4	Virtual simulation supports safe skill acquisition	2.44	0.93	Agree
SBI5	Simulation is integrated into routine TVET instruction	2.28	0.96	Disagree
	Grand Mean	**2.33**		**Disagree**

Source: Field Survey 2025

The results indicate a low extent of simulation-based instructional use (Grand Mean = 2.33). While simulation is acknowledged for safety (SBI4), its overall integration into teaching practice remains limited. This suggests that simulation is not yet a dominant instructional strategy in Nigerian TVET institutions. This aligns with Lateef (2020), who described simulation as essential for experiential learning, and Cook et al. (2021), who found that simulation improves skill retention and procedural accuracy. Alias, DeWitt, and Rahman (2019) further confirmed its effectiveness in reducing learner errors.

Research Question 5

What is the level of skill acquisition outcomes among students in Nigerian Technical and Vocational Education and Training institutions?

Table 6: Skill Acquisition Outcomes

Code	Item Statements	Mean	SD	Decision
SAO1	Students demonstrate practical occupational competence	2.28	0.94	Disagree
SAO2	Students can operate workshop equipment effectively	2.26	0.93	Disagree
SAO3	Students solve technical problems independently	2.24	0.95	Disagree
SAO4	Students demonstrate accuracy in practical tasks	2.29	0.92	Disagree
SAO5	Students show confidence in vocational tasks	2.21	0.96	Disagree
SAO6	Students are ready for workplace employment	2.19	0.97	Disagree
SAO7	Students can transfer skills to real work environments	2.17	0.98	Disagree
	Grand Mean	**2.23**		**Disagree**

Source: Field Survey 2025

The findings indicate a low level of skill acquisition outcomes (Grand Mean = 2.23). This reflects weak practical competence, limited workplace readiness, and poor skill transferability among students. This supports UNESCO (2022), which emphasized competence-based TVET evaluation, and Okolie and Igwe (2021), who argued that skill acquisition is only meaningful when it aligns with workplace demands. Wang (2020) further emphasized that modern vocational systems require adaptive and industry-responsive skills, which appear limited in this context.

Hypothesis

Hypothesis 1: Joint Contribution

H_{01}: Digital instructional capacity variables (workshop technology availability, teacher digital competence, curriculum–industry alignment, and simulation- based instructional use) do not jointly and significantly predict skill acquisition outcomes in Nigerian Technical and Vocational Education and Training institutions.

Table 7: Model Summary Showing the Joint Predictive Strength of Digital Instructional Capacity on Skill Acquisition Outcomes

R	R^2	Adjusted R^2	Std. Error
0.742	0.551	0.543	0.482

Table 8: ANOVA Showing the Joint Statistical Significance of Digital Instructional Capacity Variables in Predicting Skill Acquisition Outcomes.

Source	SS	df	MS	f	Sig.
Regression (Digital Instructional Capacity variables/Skill Acquisition Outcomes)	52.84	4	13.21	57.32	0.000***
Residual (Unexplained variation in Skill Acquisition Outcomes)	43.14	210	0.21		
Total (Skill Acquisition Outcomes)	95.98	214			

Decision: Reject H_0**1**

Table 7 presents the model summary, indicating a strong positive multiple correlation (R = 0.742) between digital instructional capacity variables and skill acquisition outcomes. The coefficient of determination (R^2 = 0.551) shows that 55.1% of the total variation in skill acquisition outcomes is jointly explained by workshop technology availability, teacher digital competence, curriculum–industry alignment, and simulation-based instructional use. The adjusted R^2 (0.543) further confirms that this explanatory power remains stable after controlling for model complexity.

Table 8 provides the ANOVA result, which tests whether this joint predictive relationship is statistically significant. The model yields an F-value of 57.32 with a significance level of p = 0.000*, which is far below the 0.05 and 0.01 threshold of significance, indicating high statistical significance at the 1% level ($p < 0.01$).

This result demonstrates that digital instructional capacity variables collectively exert a significant and non-random influence on skill acquisition outcomes. In practical terms, the low levels of skill acquisition observed earlier are strongly linked to deficiencies in instructional conditions rather than occurring by chance.

This finding is consistent with UNESCO (2022), which emphasized that TVET effectiveness is best understood through measurable competence outcomes linked to instructional inputs. Similarly, Creswell and Creswell (2023) affirmed that multivariate regression is appropriate for explaining educational outcomes influenced by multiple interacting variables. The present result therefore confirms that improving instructional capacity is central to enhancing skill acquisition outcomes in Nigerian TVET institutions.

Hypothesis 2: Relative Contribution

H_{02}: Digital instructional capacity variables (workshop technology availability, teacher digital competence, curriculum – industry alignment, and simulation- based instructional use) do not individually and significantly predict skill acquisition outcomes in Nigerian Technical and Vocational Education and Training institutions.

Table 9: Regression Coefficients Showing the Relative Contribution of Each Digital Instructional Capacity Variable to Skill Acquisition Outcomes

Predictor	β	t	Sig.
Workshop Technology Availability	0.41	7.67	0.000***
Teacher Digital Competence	0.36	6.12	0.000***
Curriculum–Industry Alignment	0.29	5.08	0.000***
Simulation-Based Instruction	0.22	4.11	0.001**

Decision: Reject H_0**2**

Table 9 presents the standardised regression coefficients (β), which indicate the relative contribution of each predictor variable to skill acquisition outcomes while controlling for the influence of other variables in the model.

All predictor variables show statistically significant contributions:

- Workshop Technology Availability (β = 0.41, p = 0.000*)** is the strongest predictor, indicating that access to functional and industry-relevant equipment has the greatest influence on students' practical competence.
- Teacher Digital Competence (β = 0.36, p = 0.000*)** is the second strongest predictor, highlighting the importance of teachers' ability to effectively integrate digital tools into instruction.
- Curriculum–Industry Alignment (β = 0.29, p = 0.000*)** also contributes significantly, confirming that relevance of training content to labour market demands enhances skill acquisition.
- Simulation-Based Instruction (β = 0.22, p = 0.001)**, although the weakest, remains statistically significant at the 1% level, indicating that simulation plays a supportive but meaningful role in skill development.

The significance levels (*** = $p < 0.01$, ** = $p < 0.05$) confirm that all variables individually predict skill acquisition outcomes beyond chance.

These findings align with Finch and Crunkilton (2018) and Li (2021), who emphasized the importance of workshop infrastructure in skill development. Redecker (2017) and Trust and Whalen (2020) highlighted the role of teacher digital competence in enhancing learning outcomes. McGrath (2019) and Adebisi (2022) stressed the importance of curriculum alignment with industry needs, while Lateef (2020) and Cook et al. (2021) supported the role of simulation as a complementary instructional strategy.

Therefore, the results demonstrate that while all variables are important, digital instructional infrastructure and teacher capability exert the most substantial influence on skill acquisition outcomes.

8. Discussion of findings

The findings reveal a clear pattern: despite pockets of adequacy, digital instructional capacity in Nigerian TVET institutions remains largely weak, and this is directly mirrored in the low level of students' skill acquisition outcomes. The descriptive results establish that limited access to functional workshop tools, weak teacher digital competence, poor curriculum alignment, and low use of simulation collectively undermine effective skill development. This pattern is not incidental, as regression analysis confirms a strong and statistically significant joint influence of these variables on skill acquisition outcomes ($R^2 = 0.551$, $p < 0.01$). Individually, workshop technology availability and teacher digital competence emerged as the most powerful drivers of skill performance. Therefore, the study firmly establishes that strengthening instructional capacity is central to reversing poor skill acquisition outcomes in Nigerian TVET institutions.

9. Conclusion

Digital instructional capacity as a predictor of skill acquisition outcomes in Technical and Vocational Education and Training institutions in Nigeria has been empirically examined in this study. The findings reveal that low instructional capacity corresponds with low skill acquisition outcomes. A strong and significant predictive relationship was established between the variables. Thus, improving instructional capacity is essential for enhancing skill acquisition outcomes.

10. Recommendations

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

1. **Prioritise Functional and Industry-Relevant Workshop Infrastructure**
   Policymakers and institutional administrators should ensure sustained investment in modern workshop equipment that reflects current industry practices. Emphasis should be placed on functionality, maintenance, and periodic upgrading to preserve the authenticity of training environments.
2. **Strengthen Teacher Digital Pedagogical Capacity**
   Regular professional development programmes should be introduced to enhance instructors' digital instructional skills. Training should focus on the pedagogical integration of digital tools, simulations, and visual technologies within practical skill instruction.
3. **Enhance Curriculum–Industry Collaboration**
   TVET institutions should institutionalise partnerships with industry stakeholders to support curriculum design, review, and implementation. Such collaboration will ensure that training content remains responsive to technological change and labour market demands.
4. **Integrate Simulation-Based Instruction Strategically**
   Simulation-based learning tools should be adopted as structured preparatory resources, particularly for complex and high-risk skills. Their use should complement, not replace, hands-on workshop training.
5. **Adopt Evidence-Based Instructional Planning**
   Educational planners and policymakers should rely on predictive research evidence when allocating resources and designing instructional interventions. Data-driven approaches will enhance the efficiency and impact ofTVET reforms.
6. **Extend Research on Digital Instructional Capacity**
   Future studies should employ longitudinal and experimental designs to examine long-term skill retention and causal relationships between digital instructional capacity and skill acquisition outcomes.

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