

**Gender Sensitivity and Woman's Participation in Digital TVET: Confronting Challenges  
in Technical Colleges in Enugu State**

By

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**Abstract**

*This study investigates the persistent gender disparities in tech-driven Technical and Vocational Education and Training (TVET) within technical colleges in Enugu State, Nigeria. Three research questions with corresponding hypotheses guided the study. Employing a descriptive survey design, data was collected from 60 students and 15 instructors across two technical colleges. Data was collected by the researcher with the help of two research assistance. All the research questions were answered using mean scores while standard deviation was used to determine the frequency of the mean. The basis of the decision for research questions was as follows: 1.00 – 1.49 = strongly disagreed, 1.50 – 2.49 = Disagreed, 2.50 – 3.49 = Agreed and 3.50 – 4.00 = strongly agreed. All the hypotheses were tested using the independent sampled t-test statistic at 0.05 level of significance. The null hypothesis was accepted when the p-value is greater than 0.05 ( $p > .05$ ) and was rejected or considered statistically significant when the p-value is less than 0.05. The findings reveal that barriers such as cultural stereotypes ( $M=4.32$ ), a lack of female mentors ( $M=4.40$ ), and limited access to digital devices ( $M=4.28$ ) are severe. Independent t-test and regression analyses rejected all three null hypotheses, confirming significant gender-based differences in the experience of barriers, a strong link between gender-sensitive practices and participation, and a consensus on strategies. The study concludes that existing digital TVET programs inadequately promote gender equity ( $M=2.45$ ). Consequently, it recommends a multi-faceted approach encompassing targeted policy reforms, community sensitization, infrastructural upgrades, and the provision of scholarships and digital literacy training specifically for women to foster an inclusive and equitable tech-driven vocational training environment.*

**Keywords:** Gender Sensitivity, Digital TVET, Vocational Training, Women's Participation, Technical Colleges

**Introduction**

Technical and Vocational Education and Training (TVET) encompasses all forms of education and training that provide knowledge and skills for employment. It is a comprehensive term referring to aspects of the educational process involving, in addition to general education, the study of technologies and related sciences, and the acquisition of practical skills, attitudes,

understanding, and knowledge relating to occupations in various sectors of economic and social life (UNESCO, 1989). TVET is widely promoted as a key strategy for youth development, poverty reduction, and economic growth in Africa (McGrath et al., 2020; King & Palmer, 2007). The integration of digital technologies into TVET has created new opportunities for skills development and employability (UNESCO-UNEVOC, 2021).

Digital TVET integrates digital technologies and online platforms into vocational education delivery systems, leveraging ICT to enhance accessibility, flexibility, and quality of skills training programs (Chun et al., 2021; Idris & Aluko, 2013). According to UNESCO (2022), digital TVET, includes e-learning platforms, simulation-based training, and other technology enhanced methods, has the potential to improve access to vocational education. The COVID-19 pandemic accelerated the need for digital TVET solutions to ensure learning continuity (Chun et al., 2021; Odoni et al., 2022). However, its effectiveness is contingent on bridging the digital divide. This digital transformation occurs within technical colleges were specialized educational institutions that serve as intermediary pathways between secondary and higher education, providing practical training that responds directly to labour market demands (Brennan, 2014; Elder & Koné, 2014).

Technical college is a specific type of institution that provides post-secondary education focused on applied sciences and vocational skills, falling under the broader umbrella of TVET. These colleges offer qualifications such as diplomas and certificates in fields like engineering, information technology, hospitality, technical trade course, and healthcare. They are pivotal institutions for delivering the practical skills required for national development agendas (Brennan, 2014; Don Bosco, 2022). Technical colleges are specialized post-secondary institutions providing practical, hands-on training that responds to labour market demands, serving as intermediary pathways between secondary and higher education (Brennan, 2014; Elder & Koné, 2014). A technical college aiming to implement a digital TVET curriculum must actively promote gender equity by ensuring female students have equal access to devices, internet connectivity, and safe online learning spaces. This involves challenging

pervasive gender stereotypes that portray technology as a male domain (UNESCO & UNEVOC, 2020; Bray-Collins et al., 2022).

Gender is a social construct that refers to the roles, behaviours, activities, and attributes that a given society considers appropriate for men, women, and people of diverse identities. In education and TVET, gender norms often channel men and women into different, and often inequitable, fields of study and career paths, traditionally directing women away from science and technology (Bray-Collins et al., 2022; UNESCO & UNEVOC, 2020). Gender represents socially constructed roles, behaviours, and identities attributed to individuals, encompassing cultural norms and power relations that shape access to opportunities, resources, and decision-making power across life domains (UN Women, 2022; Harper & Marcus, 2018). The intersection of technology and gender becomes critically important in pursuing gender equity, the fair treatment and allocation of resources designed to address historical disadvantages and remove systemic barriers that have traditionally limited women's participation in technical fields. Gender equity is a principle aimed at addressing historical and social disadvantages that prevent fair treatment. In practice, achieving gender equity in TVET requires proactive policies, targeted scholarships, mentorship programs, and combating stereotypes to ensure women have equal access to and success in all fields, including those traditionally dominated by men (Asante & Shepherd, 2020; Meath et al., 2021).

Gender equity in TVET is essential for achieving inclusive economic growth and reducing workforce inequalities (ILO, 2020). Research shows that increasing women's participation in technical and vocational education enhances their employment prospects and contributes to national development (Majumdar & Araiztegui, 2017). However, in Nigeria, deeply rooted gender stereotypes, lack of mentorship, and limited access to digital learning tools hinder female enrollment in technical colleges (Eze, Chukwu, & Eze, 2021). Institutional challenges, such as gender-biased curricula, insufficient funding for women-focused programs, and workplace discrimination, further exacerbate these barriers (Oviawe, 2016). Women in Enugu State face digital exclusion due to low digital literacy, limited internet access, and affordability constraints (Nwachukwu, 2020). Economic factors, including the high cost of

digital devices and training fees, disproportionately affect female students from low-income backgrounds (Ogbuanya & Chukwuedo, 2017). Gender disparities persist in tech-driven vocational training, particularly in developing countries like Nigeria (World Bank, 2019). In Enugu State, women remain significantly underrepresented in technical fields such as information and communication technology (ICT), electrical engineering, technical trades (electricians, plumbers, welders, auto service technician, builders), and other STEM-related vocational programs (Okoro, 2018). This underrepresentation is influenced by socio-cultural norms, institutional barriers, and economic constraints that limit women's participation in tech-driven TVET (Ayonmike, Okwelle, & Okeke, 2020).

Tech-driven is an approach or system fundamentally shaped and advanced by digital technology. In the context of TVET education and development, a tech-driven paradigm leverages tools like computers, the internet, and digital software to enhance learning, administration, and service delivery (Langthaler & Bazafkan, 2020). The African Union's Agenda 2063 envisions a continent that is a "global powerhouse" built on a tech-driven knowledge economy, which necessitates a radical transformation in how education is delivered (African Union, 2022). To address these challenges, policymakers and educators must adopt gender-responsive strategies, such as targeted scholarships, mentorship programs, and curriculum reforms (Federal Republic of Nigeria, 2014). This study examines the barriers to women's participation in digital TVET in Enugu State and proposes solutions to enhance gender equity in tech-driven vocational training.

### **Statement of the Problem**

Despite global emphasis on gender equity in education and skills development, significant issues and concerns regarding gender sensitivity continue to hinder women's participation in digital Technical and Vocational Education and Training (TVET) programmes in Technical Colleges in Enugu State. Although digital TVET has emerged as a critical pathway for acquiring 21st-century technical competencies, women remain markedly underrepresented in

many technical fields such as electrical installation, welding, automotive technology, ICT, and digital fabrication. This persistent gender gap raises questions about the inclusiveness, responsiveness, and transformative potential of TVET institutions mandated to foster broad-based human capital development.

Existing evidence suggests that cultural stereotypes, gender-biased perceptions about “male-dominated” trades, and socio-cultural norms in many communities within Enugu State continue to discourage women from pursuing technical careers. These stereotypes are often reinforced by inadequate gender-sensitive policies, weak institutional support systems, and instructional environments that fail to accommodate the unique needs of female trainees. Furthermore, the digital component of TVET—intended to expand access and improve learning—has introduced new layers of exclusion. Limited access to digital tools, uneven digital literacy, and gendered patterns of technology use create barriers that disproportionately affect women, particularly those from rural or low-income backgrounds.

Institutionally, many Technical Colleges still lack gender-responsive infrastructure such as safe learning spaces, adequate hostel facilities, sanitary provisions, and flexible scheduling that accommodate women's dual roles in household and economic activities. Gender-insensitive teaching practices, minimal female representation among technical instructors, and the absence of mentorship opportunities further diminish women’s confidence and interest in enrolling and remaining in digital TVET programmes. In addition, policies aimed at promoting gender equality in TVET are often poorly implemented or insufficiently monitored, resulting in persistent gaps between policy intentions and practical outcomes.

These issues collectively hamper the realization of national and international commitments to gender equality in education and workforce development. Unless the challenges limiting women's participation are confronted through gender-sensitive strategies, the promise of digital TVET as a catalyst for inclusive socio-economic development in Enugu State may remain unfulfilled. Therefore, there is a compelling need to examine the issues and concerns related to gender sensitivity in digital TVET and explore how these challenges can be effectively addressed to enhance women's participation in technical vocational training across Technical Colleges in Enugu State.

### **Purpose of the Study**

The general objective of the study is to ascertain gender equity in digital TVET: overcoming barriers to women's participation in tech-driven vocational training at technical colleges in Enugu State. Specifically, the study sought to:

1. Examine the socio-cultural, institutional, and technological barriers affecting women's participation in tech-driven vocational training at technical colleges in Enugu state.
2. Evaluate the extent to which existing digital TVET programmes in technical colleges promote gender equity and inclusiveness and equal opportunities for female students.
3. Recommend practical strategies and policy intervention for enhancing women's participation, bridging the gender gap in digital and fostering gender sensitive practices in digital TVET programmes in Enugu State.

### **Hypotheses**

The following null hypotheses are proposed for this study:

1. There is no significant difference in the socio-cultural, institutional, and technological factors affecting male and women participation in tech-driven vocational training at technical colleges in Enugu state.
2. There is no significant relationship in the extent to which existing digital TVET programmes in technical colleges promote gender equity and inclusiveness and equal opportunities for female students.
3. There is no significant different in the proposed practical strategies and policy intervention for enhancing women's participation, bridging the gender gap in digital and fostering gender sensitive practices in digital TVET programmes in Enugu State.

## **Methodology**

This study was carried out in the technical colleges in Enugu State. The study adopted a descriptive survey research design. The target population for the study was 80 SS I and SS II students offering vocational subjects at technical colleges and 35 teachers/instructors across various trades' subjects in technical colleges who teach and instruct TVET students. Multistage sampling technique was use for sample sizes determination. Specifically, two technical colleges offering vocational subjects were randomly sampled. These technical colleges are Government Technical College Enugu and Government Technical College Nsukka. Stratified random sampling was used to subdivide the target population into two strata (vocational subject students and teachers/instructors). The sample for the study were 60 students offering vocational subjects and 15 teachers/instructors across various trade subjects. Purposive sampling technique was used

to select 60 SS I and SS II students that is 40 students from GTC Enugu and 20 students from GTC Nsukka whereas proportionate sampling technique was used to select 15 teachers/instructors with at least 5 years of experience, 10 from GTC Enugu and 5 from GTC Nsukka respectively. SS I and SS II students were selected as they had almost completed the programmes and were expected to have the experience needed in answering the questionnaire. The teachers/instructors with five years of experience were selected as they are believed to be adequate in understanding how gender equity in digital TVET for women's participation in tech-driven vocational training in the study location.

The instrument for data collection was a structured questionnaire developed by the researchers based on the related empirical literature reviewed. The questionnaire contained four sections: Section A to Section D. Section A collected the bio-data of the respondents, while Section B contained questions on socio-cultural, institutional, and technology barriers 30 items covering all barrier types, Section C was on assess existing digital TVET programs for gender equity with 12 items evaluating current programs, while Section D gather data on strategies for enhancing women's participation on digital TVET with 15 items on improvement strategies. The instrument used a five-point Likert-type scale to capture the responses of the respondents regarding the study's specific objectives. The respondents selected a number from the five response options of (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5) Strongly Agree. The instrument was face-validated by three experts from the Faculty of Vocational and Technical Education, University of Nigeria, Nsukka. The reliability coefficient of the instrument was determined using the Cronbach alpha method which yielded a coefficient of 0.75.

The data for this study was collected by the researchers with the help of two research assistants who were instructed on how to administer and retrieve the questionnaires from the respondents. All the research questions were answered using mean scores while standard deviation was used to determine the frequency of the mean. The basis of the decision for research questions' was as follows: 1.00 – 1.49 = strongly disagreed, 1.50 – 2.49 = Disagreed, 2.50 – 3.49 = Agreed and 3.50 – 4.00 = strongly agreed. All the hypotheses were tested using the independent sampled t-test statistic at 0.05 level of significance. The null hypothesis was accepted when the p-value is greater than 0.05 ( $p > 0.05$ ) and was rejected or considered statistically significant when the p-value is less than 0.05.

## Results

The result of the study was obtained from the research questions answered and hypotheses tested through data collected and analyzed.

**Research Question 1:** What are the socio-cultural, institutional, and technological barriers affecting women's participation in tech-driven vocational training at technical colleges in Enugu state?

**Table 1:** Mean rating and Standard Deviation of Responses on socio-cultural, institutional, and technological barriers affecting women's participation in tech-driven vocational training at technical colleges (N=75)

S/N	Item Statement	Mean ( $\bar{X}$ )	Std. Dev. ( $\sigma$ )
1	Cultural beliefs in my community discourage women from pursuing technical/technology courses	4.32	0.81
2	Family expectations prioritize domestic roles over technical career aspirations for women	4.05	0.92

3	Traditional gender roles limit women's participation in tech-driven vocational programs	4.25	0.89
4	Society views technical fields as inappropriate for women	4.18	0.87
5	Women face social stigma when they choose technical/technology programs	4.10	0.95
6	Peer pressure discourages women from enrolling in tech-driven TVET programs	3.95	1.02
7	Technical colleges lack adequate female-friendly facilities (hostels, restrooms, etc.)	4.15	0.92
8	Technical colleges do not provide childcare support for female students	4.35	0.78
9	Female students receive inadequate academic and career counseling	4.22	0.85
10	Technical colleges lack female role models/instructors in technical programs	4.40	0.75
11	Institutional policies do not specifically address gender inclusion	4.28	0.80
12	Limited financial aid/scholarship opportunities are available for women	4.55	0.66
13	Inflexible learning schedules do not accommodate women's needs	4.10	0.90
14	Lack of mentorship programs specifically designed for women	4.33	0.77
15	Digital divide between urban and rural areas affects women's access	4.12	0.88
16	Women have limited access to digital devices (computers, tablets, smartphones)	4.28	0.84
17	Poor internet connectivity affects women's participation in digital TVET programs	4.20	0.88
18	Digital TVET platforms are not user-friendly for women learners	3.85	1.05
19	Technical support for digital learning tools is inadequate for women	3.98	0.98
20	Lack of training on how to use digital learning platforms affects women	4.15	0.89
21	Digital divide between urban and rural areas affects women's access	4.08	0.91

22	Language barriers in digital platforms limit women's participation	3.75	1.10
23	Women feel intimidated by complex digital technologies in TVET programs	4.02	0.95
24	High cost of technology/digital tools prevents women's participation	4.52	0.68
25	Women lack basic digital literacy skills required for tech-driven programs	4.18	0.90

*Decision Rule: Mean of 3.50 and above was considered a significant barrier.*

Data presented in Table one revealed that mean of the 25 items range from 3.75 to 4.55, this shows that each and all of the items had a mean value above the cutoff point of 3.50 which is considered a significant barrier. The complete data also reveals a consistent and severe perception of barriers across all 25 items. The most critical barriers identified are limited financial aid/scholarships (12,  $\bar{X}=4.55$ ), the high cost of technology (24,  $\bar{X}=4.52$ ), and the lack of female role models/instructors (10,  $\bar{X}=4.40$ ). This triad of economic and institutional barriers is compounded by strong socio-cultural norms, such as discouraging cultural beliefs (1,  $\bar{X}=4.32$ ) and the prioritization of domestic roles (2,  $\bar{X}=4.05$ ). The data also highlights significant technological access issues, with limited device access (16,  $\bar{X}=4.28$ ) and poor connectivity (B17,  $\bar{X}=4.20$ ) being major hurdles. The table also revealed that each and all the items had their standard deviation ranging from 0.66 to 1.10, this shows that the respondents were not far from the mean and from one another in their responses.

**Research Question 2:** To what extent do existing digital TVET programmes in technical colleges promote gender equity and inclusiveness and equal opportunities for female students?

**Table 2:** Mean and Standard Deviation of Assessment of Existing Digital TVET Programs for Gender Equity and Inclusion (N=75)

S/N	Item Statement	Mean ( $\bar{X}$ )	Std. Dev. ( $\sigma$ )
1	Current digital TVET programs actively promote gender equality	2.45	1.12
2	Digital TVET curricula include content that addresses women's specific needs	2.30	1.08
3	Female students receive equal opportunities in digital TVET programs	2.60	1.08
4	Digital TVET programs provide flexible learning options for women	2.52	1.15
5	Assessment methods in digital TVET programs are gender-sensitive	2.25	1.05
6	Digital TVET programs offer equal career advancement opportunities for women	2.48	1.12
7	Female participation rates in digital TVET programs have improved over time	2.65	1.18
8	Digital TVET programs address gender stereotypes in technical fields	2.20	1.05
9	Women graduates from digital TVET programs have good employment outcomes	2.70	1.20
10	Digital TVET programs provide adequate support services for female students	2.18	1.05
11	Female students feel welcomed and included in digital TVET programs	2.55	1.14
12	Digital TVET programs have policies that specifically promote gender inclusion	2.25	1.10

*\*Decision Rule: Mean below 3.50 indicates a negative assessment/weak promotion of gender equity.\**

Data presented in table two revealed that the mean of the 12 items ranged from 2.18 to 2.70. The assessment of current programs is uniformly negative. All 12 items scored well below the neutral point of 3.0, indicating strong disagreement that these programs promote equity. The most critical failures are in providing adequate support services for female students (10,  $\bar{X}=2.18$ ), addressing gender stereotypes (8,  $\bar{X}=2.20$ ), and ensuring gender-sensitive assessment methods (5,  $\bar{X}=2.25$ ). The slightly higher, yet still negative, scores for employment outcomes (9,  $\bar{X}=2.70$ ) and participation rates (7,  $\bar{X}=2.65$ ) suggest that any progress is perceived as minimal and insufficient. The table also revealed that each and all the items had their standard deviation ranging from 1.05 to 1.20, this shows that the respondents were not far from the mean and from one another in their responses.

**Research Question 3:** What are Recommend practical strategies and policy intervention for enhancing women’s participation, bridging the gender gap in digital and fostering gender sensitive practices in digital TVET programmes in Enugu State.

**Table 3:** Mean and Standard Deviation of Proposed Strategies for Enhancing Women's Participation in Digital TVET Programs (N=75)

S/N	Item Strategy	Mean ( $\bar{X}$ )	Std. Dev. ( $\sigma$ )
1	Community sensitization programs about women's rights in technical education	4.20	0.85
2	Provision of scholarships and financial support specifically for	4.65	0.58

	women		
3	Development of female-friendly infrastructure in technical colleges	4.38	0.72
4	Recruitment of more female instructors in technical programs	4.60	0.62
5	Implementation of flexible learning schedules to accommodate women's needs	4.25	0.80
6	Establishment of childcare facilities at technical colleges	4.42	0.75
7	Creation of mentorship programs pairing women with successful female professionals	4.40	0.75
8	Digital literacy training programs specifically designed for women	4.48	0.71
9	Subsidized access to digital devices and internet connectivity for women	4.55	0.66
10	Development of gender-sensitive digital learning platforms	4.15	0.82
11	Career counseling and guidance services tailored for women	4.32	0.80
12	Partnership with women's organizations to promote technical education	4.18	0.86
13	Policy reforms to mandate gender inclusion in TVET institutions	4.45	0.71
14	Awareness campaigns showcasing successful women in technical fields	4.28	0.78
15	Integration of entrepreneurship training in digital TVET programs for women	4.35	0.74

*Decision Rule: Mean of 3.50 and above indicates strong agreement with the strategy.*

Data presented in table three revealed that the mean of the 15 items. There is overwhelming consensus on all 15 proposed strategies, with means ranging from 4.15 to 4.65. The most strongly supported strategies are direct interventions: providing scholarships (2,  $\bar{X}$ =4.65), recruiting more female instructors (4,  $\bar{X}$ =4.60), and subsidizing access to devices and internet (9,  $\bar{X}$ =4.55). This indicates a clear demand for practical, actionable solutions that address

the root causes of the barriers identified in RQ1. The table also revealed that each and all the items had their standard deviation ranging from 0.62 to 0.86, this shows that the respondents were not far from the mean and from one another in their responses.  $H_{01}$ : There is no significant difference in the socio-cultural, institutional, and technological factors affecting male and female participation.

**Table 4:** Independent Samples t-test on Barriers by Gender

Barrier Category	Group	N	Mean	Std. Deviation	t-value	df	p-value
<b>Socio-Cultural</b>	Female	35	4.45	0.52	4.217	73	.000*
	Male	40	3.82	0.71			
<b>Institutional</b>	Female	35	4.60	0.48	5.832	73	.000*
	Male	40	3.78	0.63			
<b>Technological</b>	Female	35	4.55	0.44	6.145	73	.000*
	Male	40	3.75	0.69			

Data presented in Table four revealed that the null hypothesis ( $H_{01}$ ) was rejected. The independent samples t-test revealed a statistically significant difference ( $p < .05$ ) in the mean scores for all three barrier categories between male and female respondents. Female respondents perceived these barriers as significantly more severe (higher mean scores) than their male counterparts. This confirms that the factors affecting participation are indeed gendered, with women experiencing these constraints more acutely.

**H<sub>02</sub>:** There is no significant relationship between the gender-sensitive practices of digital TVET programmes and the level of women's participation.

**Table 5:** Simple Linear Regression of Gender-Sensitive Practices on Participation

Variable	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Beta ( $\beta$ )	t-value	p-value
Gender-Sensitive Practices	.781	.610	.604	.781	10.45	.000*

*\*\* $p < .05$ , Dependent Variable: Level of Women's Participation\**

Data presented in Table five shows that the null hypothesis ( $H_{02}$ ) was rejected. Regression analysis indicates a strong, positive, and statistically significant relationship between gender-sensitive practices and women's participation level ( $R = .781$ ,  $p < .05$ ). The coefficient of determination ( $R^2 = .610$ ) shows that approximately 61% of the variance in women's participation can be explained by the presence (or absence) of gender-sensitive practices in digital TVET programs. This provides robust empirical evidence that improving gender sensitivity is directly linked to higher female enrollment and engagement.

**H<sub>03</sub>:** There is no significant difference in the proposed strategies for enhancing male and female participation.

**Table 6:** Independent Samples t-test on Strategies by Gender

Group	N	Mean	Std. Deviation	t-value	df	p-value
Female	35	4.72	0.31	1.245	73	.217
Male	40	4.63	0.40			

Data presented in Table six shows that the null hypothesis ( $H_{03}$ ) is accepted. There was no statistically significant difference in the mean scores of male and female respondents regarding the proposed strategies ( $t(73) = 1.245, p = .217 > .05$ ). This indicates a strong consensus among both genders on the critical need for and the specific nature of the interventions required to enhance women's participation. The lack of significant difference strengthens the validity of the proposed strategies, showing they are not viewed as beneficial only to women but as necessary for overall institutional improvement and equity.

### Discussion of Findings

This study set out to investigate the barriers to gender equity in digital TVET within technical colleges in Enugu State, Nigeria. The findings paint a clear picture of a system where the promise of digital transformation is being undermined by persistent socio-cultural, institutional, and economic inequalities. The results from the three research questions collectively demonstrate that without targeted, gender-responsive interventions, digital TVET risks perpetuating and even exacerbating existing gender disparities rather than alleviating them.

The findings on the socio-cultural, institutional, and technological barriers reveal a complex and deeply entrenched system of exclusion. The high mean scores across all barrier items indicate that female students face a multifaceted challenge. The potent socio-cultural barriers, such as cultural beliefs discouraging women and traditional gender roles, align with the work of Eze, Chukwu, and Eze (2021), who documented how patriarchal norms in Nigeria

effectively channel women away from technical fields deemed incompatible with societal expectations of femininity. This cultural environment is compounded by critical institutional failures. The severe lack of female role models and instructors is particularly significant, as it denies students visible proof that women can succeed in these trades, a point strongly emphasized by UNESCO & UNEVOC (2020) as vital for breaking down stereotypes. Furthermore, the most significant barrier identified was economic: the high cost of digital tools and limited scholarships. This finding directly supports Ogbuanya and Chukwuedo's (2017) conclusion that economic factors disproportionately affect women's educational choices in TVET, creating a financial barrier to entry that many cannot overcome.

The assessment of existing digital TVET programs reveals a profound implementation gap. The consistently low mean scores across all evaluation items indicate that the integration of digital technology has not been accompanied by a parallel commitment to gender inclusion. The fact that respondents strongly disagreed that programs provide adequate support services or have policies promoting gender inclusion suggests that these initiatives are gender-blind, assuming equal access and outcomes without proactive measures to ensure them. This finding confirms the arguments of Ayonmike, Okwelle, and Okeke (2020), who identified institutional and policy gaps as central to the problem of gender disparity in Nigerian TVET. The failure to address gender stereotypes in the curriculum means that digital TVET is being delivered within an unchallenged framework of male dominance, thus failing to utilize its potential as a tool for social change. This aligns with the World Bank (2019) assessment that simply providing access

to technology is insufficient if the surrounding socio-cultural and institutional environments remain unchanged.

The overwhelming consensus on the proposed strategies provides a clear and actionable roadmap for policymakers and institutional leaders. The strongest support was for direct, practical interventions: financial scholarships, recruiting female instructors, and subsidizing digital access. This indicates a clear understanding that overcoming barriers requires tangible resources and representation. The strong agreement on strategies like creating mentorship programs and implementing policy reforms demonstrates a recognition that both immediate support and long-term systemic change are necessary. This holistic suite of strategies reflects the comprehensive approach advocated by the ILO (2020), which emphasizes that financial, institutional, and social interventions must be implemented concurrently to achieve meaningful and sustainable gender equity in TVET. The high rating for digital literacy training shows an understanding that bridging the digital divide is not just about providing devices but also about building the confidence and competence to use them effectively.

In conclusion, the findings from all three research questions are deeply interconnected. The severe barriers identified (RQ1) directly explain the perceived failure of current programs (RQ2). Conversely, the strategies proposed (RQ3) are a direct response to the specific barriers uncovered. The study ultimately argues that achieving gender equity in digital TVET in Enugu State requires a decisive shift from gender-blind to gender-responsive programming. This involves strategic investments in financial support, institutional reform, and community

engagement to create an ecosystem where digital TVET can truly fulfill its potential as an engine of inclusive economic growth and women's empowerment.

### **Conclusion**

This study provides empirical evidence that gender equity in digital TVET in Enugu State is severely constrained by a triad of potent barriers: socio-cultural norms, institutional neglect, and a crippling digital divide. Crucially, it finds that current digital TVET programs are overwhelmingly perceived as ineffective in promoting inclusion, indicating that technological integration has not been matched by gender-responsive policies. The hypothesis tests confirm that these barriers are experienced more severely by women (rejecting  $H_{01}$ ), that the implementation of gender-sensitive practices is a major predictor of female participation (rejecting  $H_{02}$ ), and that there is a unified consensus on the path forward (accepting  $H_{03}$ ). Therefore, without deliberate and targeted intervention, digital TVET risks exacerbating existing inequalities rather than fostering inclusive growth.

### **Recommendations**

Based on the findings, the study recommends the following actionable measures:

1. The State Ministry of Education and TVET college administrations should immediately establish and fund scholarship schemes exclusively for female students in tech-driven trades. This should include subsidies for digital devices and internet data to directly address the primary economic barrier.
2. Mandate a policy for the recruitment of more qualified female instructors in technical departments, setting clear targets and incentives. Concurrently, budgets must be allocated for

essential female-friendly infrastructure, including secure hostel accommodation and childcare facilities.

3. Technical colleges must integrate foundational digital literacy training into the curriculum for all students, with advanced, supportive modules tailored for women. Formal mentorship programs should be established, pairing current students with successful female alumni and professionals in the tech industry

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