International Journal of Student Performance and Educational Research (IJSPER)
VOLUME 6 NO 1. SEPTEMBER, 2026
www.ijois.com/ijsper/
ISSN: 1595-7918

ADVANCING GENDER-INCLUSIVE TVET: STRATEGIES FOR SUPPORTING GIRLS IN STEM: A CASE STUDY OF GENDER-FOCUSED INTERVENTIONS IN NIGERIA'S TECHNICAL EDUCATION SECTOR

Oyinlola Folashade Dipeolu[1], Ifeoluwapo Femi Taiwo[2] & Oluwatosin Emmanuel Ogunleye[3]
Department of Business Administration and Management, Ogun State Institute of Technology, Igbesa, Ogun State, Nigeria. PMB 2005, Oba Adesola Market Road, Igbesa, Ogun State, Nigeria.
EMAIL: dipeolu.oyinlola@ogitech.edu.ng. **ORCID ID:** https://orcid.org/0009-0000-3272-2428

DOI: https://doi.org/10.5281/zenodo.23237860

ARTICLE INFORMATION

Received: 21th July, 2026
Accepted: 19th August, 2026
Published: 24th September, 2026

KEYWORDS: gender equity in TVET; girls in STEM; mentorship programs; socio-cultural barriers.

PUBLISHER: Empirical Studies and Communication Development: A Research Center – (CESCD)

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

Open Access

http://creativecommons.org/licenses/by/4.0/

ABSTRACT

Gender disparities in Technical and Vocational Education and Training (TVET), particularly in STEM-related fields, continue to undermine inclusive development in Nigeria despite global progress toward gender equity. Girls in Nigerian TVET institutions face deeply entrenched sociocultural, institutional, and policy-related barriers that constrain their access to and success in technical disciplines. This study aimed to identify the key barriers limiting girls' participation in STEM-focused TVET programmes and evaluate the perceived effectiveness of gender-focused interventions, particularly mentorship and curriculum reforms. A quantitative research design was adopted, using structured questionnaires as the primary data-collection instrument. The study population comprised students and educators at the Ogun State Institute of Technology, Igbesa, with a sample of 300 respondents, including 240 vocational trainees and 60 educators drawn from various departments. Data were analyzed using descriptive statistics, including frequencies, percentages, and mean scores. Findings indicate that both educators and trainees strongly perceive gender stereotypes (Mean: Educators = 3.95; trainees = 3.88) and cultural beliefs (Mean: Educators = 4.15; trainees = 4.10) as significant barriers to girls' participation in STEM. In contrast, mentorship programs received only moderate endorsement (Mean: Educators = 3.43; Trainees = 3.32), indicating limited visibility and effectiveness. The study concludes that while awareness of gender barriers is high, practical interventions, especially mentorship and inclusive curricular reforms, remain underdeveloped and require urgent systemic strengthening to promote gender equity in Nigeria's TVET landscape.

INTRODUCTION

1.1. Background

Technical and Vocational Education and Training (TVET) is a process of formal or informal education and training that focuses on the development of occupational skills and competencies through practical or technical work. TVET plays a vital role in sustainable and viable economic activities, which encourages economic growth and development through gender equality by eradicating discrimination against women and girls (Alinea et al., 2023). Globally, women face numerous barriers, including gender bias in occupational choices, hindrances to education and training, particularly in rural and informal economies, and sociocultural and economic constraints. Nations need to strengthen their national skills development policies and strategies to include gender considerations, establish gender sensitive training environments, increase opportunities for women in technology-intensive areas. They should also promote female role models and encourage women to engage in lifelong learning to address these challenges.

Owing to the government's emphasis on women's equal access to education as a human right, statistics show that the enrollment of girls in primary and secondary schools has increased significantly (Williams et al., 2018). Also, there is a high level of gender stereotyping in the technical-vocational fields. TVET systems are frequently biased against women, thereby affecting women's selection, access, and participation in specific learning programs and occupations (Alinea & Reyes, 2023). This gender division of labour contributes to the perpetuation of gender inequality in the workplace and in society. Women, at all levels, should thus have equal access to decision-making, leadership, employment, political participation, economic resources and, most importantly, high-quality education (Chen et al., 2021; UNESCO, 2016).

In Africa, pre-VET programmes tend to emphasize light vocational training in business services and commercial areas, instead of industrial training, which requires more resources. This pattern is compounded by weak regulations that give private TVET providers disproportionate control over programme design and implementation. This is demonstrated in Senegal, Mali, Zimbabwe and Botswana (Muhwezi et al., 2021). Furthermore, while Technical and Vocational Education and Training (TVET) is increasingly recognised for its role in preparing young people with marketable skills and playing a key role in the development of Nigeria, it is observed that gender related inequalities are evident in TVET in the field of STEM in Nigeria (Christou & Parmaxi, 2023). There are several challenges that girls have to overcome, such as culture, gender stereotypes, lack of career guidance, and lack of institutional support. All these contribute to the gender gap in STEM-related occupations, and consequently, women are underrepresented in science and technology professions. Yanxia (2023) pointed out that gender imbalance in these respects is a restriction on the full exploitation of human potential and has a negative impact on market competitiveness and economic development.

1.2 Problem Statement

Despite this recognition, data from the National Board for Technical Education (NBTE, 2022) indicate that female enrolment was still as low as 27% at the TVET level, and even lower in engineering and ICT. In addition, only 8.3% of technical subject instructors are female, reducing role modelling opportunities for girls (NBTE, 2022). Geographic, religious and cultural factors

contribute to these gender gaps in education. In the northern parts, for example, girls' secondary school completion rates are lower due to early marriage, poverty and religious restrictions (UNICEF Nigeria, 2020). According to the Multiple Indicator Cluster Survey (MICS, 2021), only 48.6% of girls between 15 and 24 years old can read and write, while 71.3% of boys can do so.

Furthermore, there is a lack of gender sensitive infrastructure in many Nigerian TVET institutions. Bello and Muhammad (2021) found that only 23% of government-owned technical colleges in Northern Nigeria provide separate sanitation facilities for girls, contributing to high dropout rates among female students. Okeke (2020) found that girls make up a very small percentage of technical education enrolment in Nigeria, a pattern shaped by societal beliefs that technical fields are unsuitable for girls, the absence of female role models, and unsafe or non-inclusive school environments (Akinyemi & Omotayo, 2019). The design of the curriculum also has the potential to discourage or motivate female participation in TVET. In most instances, the curricula of TVETs are designed mainly to address the needs of the male students, thus leaving out the needs of the female students (Ifedili, 2019).

Negative social perceptions of women's involvement in TVET persist and continue to widen the gender gap in enrolment across Nigerian institutions. The majority of girls opt for courses that do not use industrial machines and equipment extensively, such as Finance, Hospitality and Tourism, Fashion Design, Clothing Technology, Mass Communication, ICT, Office Technology and Management. This may be due to a low number of female role models, poor quality guidance and counselling, the gender-biased curriculum, poor job opportunities, poor incentives and perceived difficulty or stress of these programmes (UNICEF Nigeria, 2021). This represents a significant missed opportunity, as admission slots in technology-based programmes remain unfilled by female candidates (Ogwo & Ezekoye, 2020; Bello & Muhammad, 2021). Addressing these entrenched barriers requires deliberate and coordinated interventions including inclusive curricula, gender-sensitive infrastructure, structured mentorship, targeted scholarships, community engagement, and teacher training in inclusive pedagogies (ADB, 2021; UNESCO-UNEVOC, 2022; Yusuf & Adigun, 2021). Without such measures, gender disparities in Nigeria's TVET system will continue to impede inclusive economic growth, innovation, and the country's long-term competitiveness.

1.3 Objectives

This study is guided by the following objectives:

1. To identify the key socio-cultural, institutional, and policy-related barriers limiting girls' access to and success in STEM-focused TVET programmes in Nigeria.
2. To assess the perceived effectiveness of gender-focused interventions, particularly mentorship programmes and curriculum reforms, in addressing these barriers.
3. To propose evidence-based strategies for fostering gender equity within Nigeria's TVET system.

2. Methodology

The study uses a quantitative research methodology with primary data collected through structured questionnaires to examine gender inclusivity in the Technical and Vocational Education and Training (TVET) sector, especially with respect to girls' enrolment in STEM-related courses

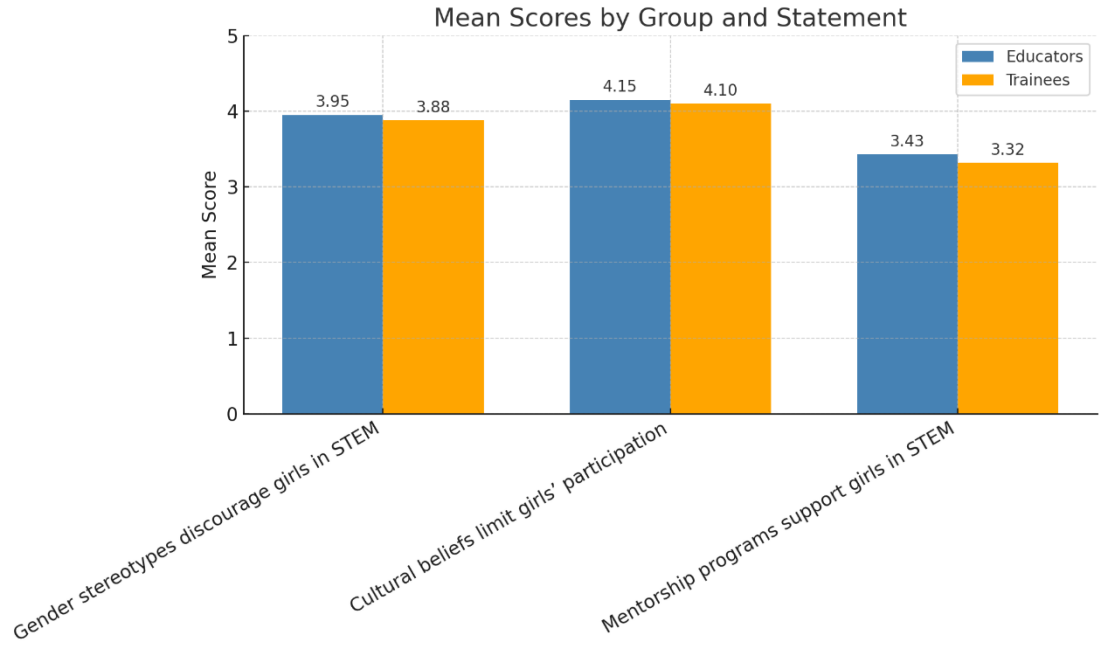
in Nigeria. 300 respondents were sampled randomly from Ogun State Institute of Technology, Igbesa, comprising 240 vocational education trainees and 60 vocational educators from different departments. The questionnaire consisted of three domains to evaluate the level of gender equity and women's participation in STEM, socio-cultural and institutional barriers and effectiveness of gender-focused interventions, including mentorship and curriculum changes. A five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) was used to quantify respondents' level of agreement with statements. The data were gathered from the participants and analysed descriptively (frequencies, percentages, mean scores) to determine the major trends, gaps and perceptions. Comparative analysis between the trainees and educators was done to identify possible differences in their perception of gender inclusion in TVET.

3. Results

Table 3.1: Result of Trainees and Educators

Gender stereotypes discourage girls in STEM						
	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean Score
Educators (n = 60)	5	5	10	50	30	3.95
Trainees (n = 240)	12	5	10	52	21	3.88
Cultural beliefs limit girls' participation						
Educators (n = 60)	0	5	10	50	35	4.15
Trainees (n = 240)	6	5	10	43	36	4.1
Mentorship programs support girls in STEM						
Educators (n = 60)	10	10	25	35	20	3.43
Trainees (n = 240)	16	11	18	35	20	3.32

Figure 3.1: Graphical Representation of Trainees and Educators



4. Discussion of Findings

The descriptive analysis identified significant differences across the three sections of the questionnaire, which focused on (i) gender equity and participation in STEM, (ii) socio-cultural and institutional barriers and (iii) stakeholders' perceptions of factors influencing girls' participation in STEM-based TVET programmes. The mean scores of both groups (Educators = 3.95, Trainees = 3.88) were high, reflecting a general level of agreement about the negative impact of gendered societal norms. The results align with the literature that has identified gender stereotypes as significant barriers to women's participation in STEM (UNESCO, 2020; Chen et al., 2021).

In general, there was a high level of agreement between the two groups regarding cultural beliefs (Educators = 4.15; Trainees = 4.10), and minimal variability of responses, suggesting that the majority understood the nature of cultural constraints. No educator strongly disagreed with this item. The findings corroborate the work of Aina and Cameron (2011), which argues that traditional gender roles remain entrenched in Nigerian society and continue to influence the educational pursuits and career options for girls in technical occupations. The cultural dimension of this problem is further supported by the fact that early marriage, poverty, and religious restrictions on girls' education are more prevalent in the northern regions, as noted by UNICEF Nigeria (2020).

In contrast, the effectiveness of mentorship programmes received only moderate endorsement (Educators = 3.43; Trainees = 3.32), with trainees showing greater skepticism. This large variation in trainee responses indicates a diversity of experiences in mentoring that aligns with the findings that mentoring programmes in Nigerian TVET institutions are poorly funded, insufficiently structured or are not easily accessible to all trainees (Ogwo & Ezekoye, 2020; Yusuf & Adigun, 2021). This moderately low rating is not a reflection of the ineffectiveness of mentorship in principle, but rather a call to action for the establishment of more effective, more visible, and institutionally embedded mentorship structures.

Overall, these results highlight a paradox, as although awareness of the barriers to girls' participation in TVET is near-universal, the concrete arrangements put in place to address them, specifically mentorship, are poorly developed. The disparities in problem identification and effectiveness of interventions are a key policy priority and institutional response area of concern (ADB, 2021; UNESCO-UNEVOC, 2022).

5. Conclusion

This study examined the sociocultural, institutional and policy challenges that hinder girls' enrolment in STEM-related TVET programmes in Nigeria and to assess the effectiveness of gender interventions. Results showed that the most salient and pervasive barriers are entrenched gender stereotypes and cultural beliefs, with a high level of agreement recorded by both educators and trainees across these dimensions. There was a moderate level of confidence in the mentorship programme, despite its recognition, due to poor implementation, limited dissemination, and limited institutional support in TVET in Nigeria. These results are in line with regional and international findings regarding gender gaps in technical education. The main weakness of the study is its single institutional study, Ogun State Institute of Technology, Igbesa, which may affect the generalisability of the findings to other states or TVET contexts in Nigeria; further studies could be multi-institutional and/or be conducted at the national level. In line with these identified gaps, TVET institutions are recommended to conduct a thorough review of their curriculum to remove gender bias; design mentorship programmes that are structured, supported, and monitored; involve communities and religious leaders in breaking stereotypes; establish scholarships and career guidance for girls pursuing technical courses in non-traditional fields; and build gender-sensitive infrastructure, such as safe sanitation facilities. Gender mainstreaming in TVET is not only a matter of education justice, but it is an imperative for national economic development and competitiveness in Nigeria, at least in terms of innovation and long-term competitiveness.

References

ADB. (2021). Gender equality and social inclusion in technical and vocational education and training: A review of the evidence in Asia and the Pacific. Asian Development Bank. https://www.adb.org/publications

Aina, O. I., & Cameron, R. (2011). Understanding cultural influence on gender participation in science and technology: Evidence from Nigeria. *International Journal of Gender Studies in Developing Societies*, *1*(2), 123–137.

Akinyemi, A., & Omotayo, O. (2019). Gender disparities in technical and vocational education in Nigeria: Causes and policy implications. *Journal of Education and Practice, 10*(2), 56–65.

Alinea, A. L., & Reyes, C. M. (2023). Gender equity in vocational education and training: Policy recommendations for Southeast Asia. *International Journal of Educational Development, 97*, 102689. https://doi.org/10.1016/j.ijedudev.2023.102689

Alinea, A. L., Reyes, C. M., & Torres, D. (2023). Removing barriers to girls' participation in STEM through TVET: Regional evidence and strategies. *Asian Journal of Education and Development, 32*(1), 44–60.

Bello, R. A., & Muhammad, Y. T. (2021). Tackling gender disparities in STEM education in Nigeria: The role of inclusive TVET. *African Journal of Technical Education and Skills Development*, 13(2), 119–134.

Chen, X., Liu, L., & Zhang, Y. (2021). Gender stereotypes and women's participation in vocational education: Evidence from sub-Saharan Africa. *International Review of Education, 67*, 559–578. https://doi.org/10.1007/s11159-021-09905-1

Christou, M., & Parmaxi, A. (2023). Addressing gender gaps in STEM vocational education: An analysis of barriers and enablers. *Gender and Education, 35*(1), 56–75. https://doi.org/10.1080/09540253.2022.2098142

Ifedili, C. J. (2019). Curriculum exclusion and gender inequity in Nigeria's TVET institutions. *Nigerian Journal of Curriculum Studies, 26*(1), 142–150.

MICS. (2021). Multiple indicator cluster survey 2021: Nigeria. National Bureau of Statistics.

Muhwezi, D., Sibanda, M., & Chikodzi, D. (2021). TVET curriculum mismatch and gender inequity in Africa: Lessons from Botswana and Zimbabwe. *Journal of Vocational Studies in Africa, 6*(2), 91–108.

NBTE, (2022). Annual report on technical education and gender inclusion in Nigeria. National Board for Technical Education (NBTE).

Ogwo, B. A., & Ezekoye, E. A. (2020). Strategies for enhancing female participation in STEM-focused TVET. *Journal of Vocational and Adult Education, 12*(1), 1–12.

Okeke, C. (2020). Girls' underrepresentation in technical education in Nigeria: A policy analysis. Education Reform Initiative.

UNESCO, (2016). Strategy for technical and vocational education and training (TVET) (2016–2021). United Nations Educational, Scientific and Cultural Organization. https://unesdoc.unesco.org

UNESCO, (2020). Global education monitoring report: Gender report—A new generation. United Nations Educational, Scientific, and Cultural Organization.

UNESCO-UNEVOC. (2022). Gender equality in TVET: A practical guide. https://unevoc.unesco.org

UNICEF (2020). Annual education sector report: Gender and education in Northern Nigeria.

https://www.unicef.org/nigeria/

UNICEF (2021). Gender equity and access in education: Insights from Nigeria's secondary schools. https://www.unicef.org/nigeria/

Williams, P. J., Kizito, R., & Naidoo, A. (2018). Gender equity in African education systems: Exploring constraints and opportunities. *International Journal of Educational Research, 91*, 109–118.

Yanxia, L. (2023). Gender inequality in STEM and implications for national competitiveness. *Journal of Comparative Education and Policy Studies, 45*(1), 25–39.

Yusuf, S. A., & Adigun, J. T. (2021). Female participation in Nigeria's STEM education: Challenges and policy recommendations. *Journal of Educational Policy and Implementation, 7*(1), 88–103.