



SOCIO-ECONOMICS DETERMINANTS OF GENDER DISPARITY IN TECHNOLOGY EDUCATION: EMPIRICAL INSIGHTS FROM FEMALE STUDENTS IN POLYTECHNICS, SOKOTO STATE, NIGERIA

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Abstract

This study examined socio-economic factors predicting gender disparities in technology education among female students of Umaru Ali Shinkafi Polytechnic, Sokoto State, Nigeria. A mixed-methods design was adopted, combining descriptive survey and phenomenological approaches. The study population consisted of 596 final-year female students across six technology-related programmes. Using stratified random sampling, a sample of 234 students was selected, while 13 females were purposively chosen for in-depth interviews. Two instruments were employed: a structured questionnaire (SPFGDTEQ) and an interview guide. Content validity was established through expert review and reliability of 0.71 was obtained using Cronbach's alpha. Data were analyzed using descriptive statistics (mean score) for the quantitative aspect, while qualitative data were subjected to thematic analysis. Findings revealed that high educational costs, limited household income and lack of scholarships significantly constrain female participation in technology education. The study concluded that socio-economic barriers remain central to female underrepresentation in technical fields. It recommends the establishment of targeted scholarships and subsidized tuition plans to reduce financial burdens and promote equitable female participation in technology education.

Keywords: Socio-economic factors, Gender disparities, Technology education, Female participation

Introduction

Women constitute a significant proportion of the global population. And the 2023 report of United Nations' World Population Prospects revealed that they constitute over 48% of global population. This demographic strength should ideally translate into equal participation in social institutions. However, women's participation often remains lower than men producing a persistent condition Sociologists describe as gender disparity (Millett & Daly, cited in Haralambos and Holborn, 2018). In this context,

gender disparity refers to the unequal representation of males and females in social roles, opportunities and outcomes. It reflects imbalances in access, participation and benefits across societal domains (Rao & Chand, 2019). One area where this disparity is particularly visible is technology education, which covers fields such as engineering, construction and related technical disciplines. Research evidences show that women are underrepresented in technology education. For instance, the Global Gender Gap Report (2023) indicates that women constitute only 41.9% of the global workforce, with much lower participation in high-productivity technical sectors. Similarly, UNESCO (2021) and ILO (2020) report that female enrolment in vocational and technical programmes remains significantly lower than male enrolment. This concern has been widely documented in literatures. Ayub (2017) reported low participation of women in TVET in South Asia, while Bengesai and Paideya (2018) revealed high female dropout rates in South Africa's technical programmes. Ngugi and Muthima (2017) further observed that in sub-Saharan Africa, women remain grossly underrepresented in technical and vocational fields.

In Nigeria, technology education is an integral component of tertiary education. According to the National Policy on Education (NPE) (2013), it is provided in universities, polytechnics, monotechnic and Colleges of Education (technical). As stated in section 5 paragraph 102 (e) of the NPE (2013), one of the goals of Technology Education at Tertiary level shall be to give training that impart the necessary skills for the production of necessary skilled technicians, technologists and other skilled personnel who would be enterprising and self-reliant. Corroborating this, Okolocha & Nwadiani (2015) explained that technology education equip learners with practical skills, entrepreneurial competence and self-reliance.

Despite the fact that the constitution of the Federal Republic of Nigeria 1999 stipulates that the direction of national policy should ensure equal and adequate educational opportunities at all levels of education, yet women continue to face barriers that reduce their chances of equal participation due to many factors. Studies such as Moyo, Sankhulani and Namalima (2021) identified cost of training and poverty as central barriers, while Shahidul and Karim (2015) found that financial limitations contribute to low female participation in Technical and Vocational Education. Other socio-economic factors as Yakubu and Abubakar (2022) observed in Nigerian context are scarce household resources which are often directed toward male children's education. It is on this basis that World Bank (2023) report on Nigeria's education sector revealed that female students in technical programmes are only 30% and they are more likely to drop out due to financial pressures compared to their male counterparts.

In view of the socio-economic factors affecting female participation in technology education, studies conducted in different contexts proffer strategies to reduce them. Peter, Johnson, Francis and Tukur (2025) study identified strategies such as industry collaborations, enforcing gender-sensitive policies, providing scholarships, recruiting more female educators and creating mentorship programmes. Similarly, Ajayi and Oladimeji (2020) identified financial support as a strategy. While Oluwakemi and Ayodeji cited in Petr et als (2025) found that strategy of raising awareness through workshops could improve female participation in technical education. Against the backdrop of studies conducted in other contexts, this study therefore explores perceived socio-economic factors contributing to gender disparities in technology education, offering insights into how female students themselves experience and interpret these challenges.

Statement of the Problem

Technology education is central to national development as it equips learners with practical skills for employment, entrepreneurship and industrial growth. Despite its importance, female participation in technology education remains disproportionately low compared to that of males. In Umaru Ali Shinkafi Polytechnic, Sokoto State, female students constitute only 19.5% (596) out of the total 3,054 final-year students in six technology education-related courses in the 2024/2025 academic session. Although several studies have examined gender disparities in education in northern Nigeria, there is limited empirical focus on the socio-economic factors responsible for this disparity specifically in technology education at the polytechnic level from the perspectives of female students. This gap is critical, as polytechnics are designed to train middle-level technical manpower that can address pressing challenges of unemployment and poverty. It is therefore imperative to examine the socio-economic factors that shape female students' participation in technology education and to identify strategies that can foster more inclusive and equitable access.

Research Questions

The research questions for the study are:

1. What socio-economic factors influence female students' participation in technology education courses in polytechnics in Sokoto State?
2. From the perspectives of female students, what strategies can be adopted to reduce gender disparities in technology education in Sokoto State?

Objectives of the Study

The objectives of the study are:

1. To identify socio-economic factors influencing female students' participation in technology education courses.
2. To determine strategies that can be adopted to reduce gender disparities in technology education from the perspectives of female students.

Review of Related Empirical Studies

Several empirical studies have investigated socio-economic factors and strategies affecting female participation in technology education. From the international perspective, Shahidul and Karim (2015) in Bangladesh adopted a cross-sectional survey with 180 purposively selected secondary and vocational students. Using questionnaires and interviews analyzed with descriptive statistics and chi-square, they found that financial constraints, including tuition and hidden costs, significantly hinder female participation in TVET. While relevant, the study is limited to Bangladesh, unlike the present study, which examines North-West Nigeria where cultural and religious influences intersect with economic barriers. In Africa, Moyo, Sankhulani and Namalima (2021) examined socio-economic challenges to female participation in TVET in Malawi using a descriptive survey. A total of 250 female students from public institutions were sampled through stratified random sampling. Data collected via questionnaires and focus group discussions were analyzed using descriptive statistics and thematic analysis. Findings revealed poverty and training costs as key barriers. Unlike this, the present study investigates a broader range of socio-economic issues in Nigeria.

In Nigeria, Yakubu and Abubakar (2022) surveyed 200 households in Kano and Sokoto using multi-stage sampling. A structured questionnaire analyzed with regression showed households prioritize male education over female participation in technical fields. Similarly, the World Bank (2023), analyzing EMIS and household surveys, reported that females form only 30% of technical enrolment and face higher dropout due to financial pressures.

On strategies, Peter et al. (2025) identified collaborations, gender-sensitive policies, scholarships, female educators, and mentorship through a mixed-methods study of 320 respondents in North-West Nigeria. Ajayi and Oladimeji (2020) found scholarships and stipends most effective in a survey of 120 female students, while Oluwakemi and Ayodeji (cited in Peter et al., 2025) showed awareness campaigns improved girls' interest in Lagos. Therefore, while previous studies highlight barriers and strategies, the present research uniquely combines mixed methods to explore socio-economic factors and student-driven strategies at Ummaru Ali Shinkaf polytechnic, Sokoto State Nigeria .

Theoretical Framework

Human Capital Theory and Gender Socialization Theory provided framework for this research on socio-economic factors that influence female students' participation in technology education courses from the perspectives of female students. The postulations of Human Capital Theory as cited in Haralambos and Holborn (2018) affirmed that education and skills acquisition are investments that increase productivity, income potential and contributions to national development. Going alone with the theory, it can be understood that limited access to technology education reduces female students' chances of acquiring high-value skills, thereby constraining their long-term income and career prospects. It also highlights how household resource allocation decisions shaped by poverty and perceived economic returns affect female participation. On the other hand, Gender Socialization Theory, advanced by Ann Oakley, cited in Haralambos and Holborn (2018) emphasize that gender roles are socially constructed and reinforced through family, peers and cultural expectations. While this study focuses on economic factors, the theory provides a lens to understand why households may perceive investing in sons' education as more economically viable than daughters', thereby reinforcing disparities.

Research Methodology

A mixed-method design was adopted for the study which involved descriptive survey (Quantitative) and Phenomenological (Qualitative) to enable triangulation and a richer understanding of socio-economic factors. The population of the study is all 596 final year female students enrolled in six technology education related National Diploma programmes at Umaru Ali Shinkafi Polytechnic, Sokoto State.

Table 1: Population of the Study

S/N	Programme	Final Year Students
1	Mechanical Engineering Technology	26
2	Electrical/Electronic Engineering	91
3	Civil Engineering Technology	161
4	Chemical Engineering Technology	171
5	Agricultural Technology	51
6	Animal Health & Production Technology	96
	Total	596

Source: Academic Planning office, Ummaru Ali Shinkafi Polytechnic

Sample and Sampling Technique

Based on Research Advisors (2006) guide, a sample of 234 was drawn using Stratified Random technique where students were classified according to their programmes. Proportionate Technique was used so that each programme was sampled based on its population. Similarly, 13 respondents were purposively selected for in-depth interview because Qualitative research makes use of limited

sample in order to get detail information. In Qualitative research, the aim is to capture the detail stories of the respondents, it is therefore most conducive to select a fewer number of participants (Creswell 2013; Marriam 2009; Denzin & Lincoln, 2018)

Table 2: Sample of the Study

S/N	Programme	Final Year Students	Sample
1	Mechanical Engineering Technology	26	10
2	Electrical/Electronic Engineering	91	36
3	Civil Engineering Technology	161	63
4	Chemical Engineering Technology	171	67
5	Agricultural Technology	51	20
6	Animal Health & Production Technology	96	38
	Total	596	234

Source: Field survey, 2025

Research Instruments

The Research instruments used for the study are researcher-designed structured Questionnaire titled Students Perceived Factors for Gender Disparities in Technology Education Questionnaire (SPFGDTEQ) and In-depth interview Guide. The SPFGDTEQ is adopted 5 points Likert scale with sections A (Personal Information), B (Socio-Economic factors) and C (suggested strategies). The in-depth interview guide consists of items related to the research questions.

Validity and Reliability of the Instruments

Content validity of all the instruments was ascertained by experts from the Faculty of Education and Extension Services Usmanu Danfodiyo University, Sokoto whose suggestions were incorporated in the final drafts of the instruments. The Reliability index of 0.71 was obtained using Cronbach's alpha for each multi-item scale. The Qualitative interview guide reliability was ensured through a technique of repeating question in a slightly different form during the interview as recommended by Best and Kahn (2015).

Data obtained from SPFGDTEQ with the help of research assistants was analyzed using descriptive statistics namely frequency and mean scores set at 3.5 weighted mean for table 3 and 3.7 weighted means for table 4. The weighted mean is sum of all mean scores divide by number of items. However, Qualitative method of thematic analysis was used to analyse data obtained through In-depth Interview.

Results and Discussion

The results consisted of Quantitative data obtained using SPFGDTEQ instrument presented and analyzed on table 3 and 4, as well as Qualitative data thematically analyzed in themes 1, 2 and sub-themes.

Table 3: Mean Responses on Socio-economic factors for Gender Disparities

S/N	Statement	Mean Score	Interpretation
1	High cost of education discourages women from pursuing technology-related courses	3.6	Strongly Agree
2	Limited household income affects women's choice of courses	3.6	Strongly Agree
3	Financial dependence on family reduces female interest in technology education	3.3	Disagree
4	Lack of scholarships reduces female access to technology education	3.7	Strongly Agree
5	Limited job opportunities for women in technical fields reduce motivation	3.7	Strongly Agree
6	High cost of learning materials discourages many female students	3.2	Disagree
7	Parents invest more in male children's education than females'	3.6	Strongly Agree
8	Economic hardship forces many families to withdraw girls from technical education	3.5	Agree
9	Some relatives discourage investment in female education due to limited resources	3.5	Agree
10	Family financial responsibilities (e.g., siblings' fees) limits female students' academic choices.	3.5	Agree
11	Expectation of early marriage makes families reluctant to invest in female education	3.2	Disagree
12	Limited financial support from family restricts women access to technical courses	3.4	Disagree

Source: Field Survey, 2025

Weighted mean= 3.5 Decision rule: Weighted mean = 3.5, then: $\bar{u} \text{ Mean} \geq 3.5 \rightarrow \text{Agree}$

$\bar{u} \text{ Mean} < 3.5 \rightarrow \text{Disagree}$

The analysis of socio-economic factors responsible for gender disparity in technology education at the Polytechnic of Sokoto State reveals that majority of respondents agreed that financial and household-related challenges significantly affect female participation. Factors such as the high cost of education (mean = 3.6), limited household income (mean = 3.6), lack of scholarships (mean = 3.7) and limited job opportunities for women in technical fields (mean = 3.7) were strongly agreed upon as major constraints. Similarly, parental preference for investing more in the education of male children (mean = 3.6), economic hardship that forces families to withdraw girls from school (mean = 3.5) and discouragement from relatives due to limited resources (mean = 3.5) were also identified as significant barriers to female enrolment in technical courses.

On the other hand, some factors were not considered as strong determinants by the respondents. These include financial dependence on family (mean = 3.3), high cost of learning materials (mean = 3.2), expectation of early marriage (mean = 3.2) and limited financial support from family (mean = 3.4). Since these items scored below the weighted mean of 3.5, they were disagreed upon as major contributors to gender disparity.

Table 4: Mean Responses on Strategies to Reduce Gender Disparities

S/N	Statement	Mean Score	Interpretation
1	Introduce subsidized tuition and flexible payment plans to reduce the high cost of education	3.7	Agree
2	Provide targeted scholarships and bursaries for female students from low-income families to ease financial burden.	3.8	Agree
3	Offer financial support schemes such as grants or stipends to reduce female dependence on family resources.	3.7	Agree
4	Create government and NGO-funded programmes to cushion economic hardship and prevent withdrawal of girls from technical education	3.7	Agree
5	Introduce career counseling and employment linkages for women in technology fields to improve job opportunities and motivation	3.5	Disagree
6	Provide free or subsidized learning materials and equipment to reduce additional financial burdens on female students	3.7	Agree
7	Establish micro-credit and skill acquisition programmes for parents and guardians, enabling them to better support their daughters' education	3.6	Disagree
8	Encourage public-private partnerships where industries support female students with sponsorships, internships and stipends	3.7	Agree
9	Introduce conditional cash transfer schemes for families who keep their daughters enrolled in technical education programs.	3.5	Disagree
10	. Promote community-based cooperative savings schemes to help families raise funds for girls' education in technology.	3.6	Agree

Source: Field Survey, 2025 weighted mean= 3.7

Decision rule: Weighted mean = 3.7, then:

$\mu\text{Mean} \geq 3.7 \rightarrow \text{Agreed}$

$\mu\text{Mean} < 3.7 \rightarrow \text{Disagreed}$

The analysis of Table 4 on strategies to reduce gender disparities in technology education shows that respondents generally agreed with most of the proposed measures, as the overall weighted mean was 3.7. Specifically, strategies such as the introduction of subsidized tuition and flexible payment plans (mean = 3.7), provision of targeted scholarships and bursaries for female students from low-income families (mean = 3.8), offering financial support schemes such as grants or stipends (mean = 3.7), government and NGO-funded programmes to cushion economic hardship (mean = 3.7), provision of free or subsidized learning materials (mean = 3.7) and encouraging public-private partnerships to support female students (mean = 3.7) all received agreement from the respondents. Similarly, the promotion of community-based cooperative savings schemes (mean = 3.6) was also acknowledged as a relevant intervention.

However, some strategies were disagreed upon because they fell below the weighted mean of 3.7. These include the introduction of career counselling and employment linkages for women in technology fields (mean = 3.5), establishment of micro-credit and skill acquisition programmes for parents and guardians (mean = 3.6 and the use of conditional cash transfer schemes for families (mean = 3.5).

Thematic Analysis of In-Depth Interviews

Two main themes (theme 1 and 2) emerged from the interview data which are as follows:

- i. Theme 1: Socio-economic factors responsible for Gender Disparity in Technology Education
- ii. Theme 2: Strategies for Reducing Gender Disparities in Technology Education
- iii.

Socio-economic factors responsible for Gender Disparity in Technology Education

Under this theme, sub-themes were generated and analyzed in relation to the informant's original description. The narrations are reported in the original word of the interviewee.

Cost of education: High Cost of education is a sub-theme that emerged. Many respondents described the burden of educational costs as a key barrier. One participant stated:

My parents said they cannot afford tools require for my studies at first. They felt the money should be spent on my brothers, since they are expected to provide for the family. (P 2)

This reflects the quantitative finding where high cost of education (mean = 3.6) and limited household income (mean = 3.6) were strongly agreed upon as major socioeconomic factors.

Limited supports; Participants repeatedly emphasized the absence of scholarships as a challenge. For instance:

Even when I want to study, my family says fees are too high for a girl. Lack of scholarships makes it worse. (P 3)

This aligns with survey results where lack of scholarships (mean = 3.7) was identified as a major barrier, while respondents agreed on scholarship provision (mean = 3.8) as the most effective strategy.

Gendered Resource Allocation: Interviewees highlighted that families often invest more in boys than in girls. One participant explained:

In my family, boys are seen as future breadwinners, so they get more financial support. As a girl, I had to plead before they agreed to pay my fees. (P11)

This directly supports the quantitative data where parents invest more in male children (mean = 3.6) and relatives discourage female education due to limited resources (mean = 3.5).

Economic Hardship: Some respondents reported that financial struggles forced families to make difficult choices:

My parents supported me at first, but resources are scarce. My brothers' education is always prioritized when money is short. (P 6)

This relates with the survey where economic hardship forcing withdrawal of girls (mean = 3.5) was agreed upon as a significant barrier. **Marriage Expectations:** While marriage expectations

were mentioned, they were not considered a strong determinant in the quantitative results (mean = 3.2). One participant shared:

Marriage talks keep coming up. My uncle says instead of spending money on my fees, they should save it for my marriage. (P 2)

Although noted, this was not widely supported across the broader survey data.

Strategies for Reducing Gender Disparities

Sub-themes were generated and analyzed in relation to the informant's original description.

Subsidized Tuition: Several participants strongly supported subsidized tuition and installment payment options, noting that it would ease parents' burden and encourage more girls to remain in school. For example:

If fees were reduced or we could pay in parts, my parents would not hesitate to support me. (R 3)

However, a few others felt tuition subsidy alone would not solve the problem, arguing that hidden costs such as transport and materials still discourage participation. As one respondent remarked:

Even if tuition is reduced, we still spend much on transport and tools (R 6)

Scholarships: Majority of respondents emphasized scholarships as the most practical solution, especially for girls from low-income families. One explained:

Scholarships will give girls equal chance; otherwise, parents prefer to sponsor boys. (R 7)

Yet, a minority expressed doubt about fairness in implementation, citing cases where scholarships do not reach the most deserving:

Scholarships sound good, but often those who need them most do not get them. (R10)

Financial Support: Many participants welcomed the idea of small stipends or grants to cover daily expenses such as transportation and meals. For instance:

Even ₦5,000 monthly will make a difference because it reduces our dependence on parents. (R 9)

However, a few questioned whether stipends would be sustainable, warning that short-term grants may not address long-term barriers:

Stipends may help for a while, but without real scholarships or jobs, the problem continues. (R 1)

Support Programmes: Respondents generally agreed that external programmes are essential, especially during family economic hardship. One respondent stressed:

When parents lack money, outside support from NGOs or government can keep girls in school. (R11)

Yet, others were cautious, pointing out that reliance on NGOs may not be dependable: “these NGO supports come and go; they are not consistent” (R 2)

Learning Materials: A number of participants highlighted the high cost of textbooks and workshop tools as a serious burden:

“Buying tools for practical is even harder than paying tuition sometimes”. (R 4)

Others downplayed this, suggesting that tuition and scholarships remain bigger priorities:

Tools are expensive, yes, but if fees are covered, parents can still manage the rest. (R12)

From the analysis, it is of note that concerning this, most respondents supported strategies such as scholarships; subsidized tuition, stipends and NGO/government programmes, different views emerged. Some students were optimistic about industry sponsorship and cooperative savings, while others doubted their feasibility. For example, respondent 13 (R13) stated that: “It's hard for parents who cannot afford food to join a savings group for school fees.” And (R5) explained that “Industries mostly prefer boys; I am not sure they will sponsor girls.” (R 5)

Summary of Findings

Based on the analysis, the findings of the study are as follows:

1. The study found high cost of education, limited household income, lack of scholarships, limited job opportunities for women and gendered household investment patterns as the main socio-economic factors for gender disparities in technology education among female polytechnic students in Sokoto State.
2. It also found from the perspectives of female students that direct financial interventions are the most effective strategies to address these disparities. This is because students strongly supported measures such as targeted scholarships, subsidized tuition and provision of stipends or bursaries.

Discussion of Findings

The findings of this study revealed that socio-economic factors remain the determinants of female participation in technology education in Sokoto State. Quantitative data from Table 3 and narratives from the interviews revealed that socioeconomic factors such as high cost of education, limited household income, lack of scholarships, limited job opportunities and gendered household resource allocation significantly hinder female students' access and persistence. These findings supported findings of studies by Moyo, Sankhulani, and Namalima (2021) in Malawi and Shahidul and Karim (2015) in Bangladesh both reported that poverty and financial limitations reduce female participation in technical and vocational education. Similarly, Okafor (2021) found low female enrolment in Rivers State due to financial barriers, while Yakubu and Abubakar (2022) confirmed that in northern Nigeria, families often prioritize the education of boys when resources are scarce. The present study therefore reinforces the consistent view across contexts that poverty, income levels and discriminatory investment patterns are decisive in shaping gender disparities in technical fields.

In addition, the study established that direct financial interventions are the most widely endorsed strategies for addressing gender gaps in technology education. From Table 4, students strongly supported targeted scholarships and bursaries, subsidized tuition, grants and stipends, government and NGO support programmes. These strategies were also emphasized in interviews, where participants described scholarships as important in easing family resistance to female education. This

is in agreement with Ajayi and Oladimeji (2020), UNESCO (2021) and ILO (2020), which highlighted that targeted financial support is critical to closing gender gaps in technical education globally. Furthermore, the preference awareness in this study echoes Oluwakemi and Ayodeji cited in Petr et al (2025) who considered the strategy as a central pathway to gender equity in technical fields.

Conclusion

The study shows that financial barriers such as high costs, low household income, lack of scholarships and unequal family investment are the main influencing factors for gender disparities in technology education in Sokoto State. It also finds that direct financial interventions, including scholarships, subsidies and support programmes, are the most effective strategies for promoting equitable female participation.

Recommendations

Based on the findings of the study and conclusion drawn, the study recommends that:

1. Government at state and federal levels should collaborate with the polytechnic authorities to establish targeted scholarship schemes and subsidized tuition plans for female students, particularly from low-income households. This will directly reduce the financial burden that discourages female participation in technology education.
2. The study further recommends that government, NGOs and industry partners should collaborate to provide bursaries, stipends, subsidized learning materials and sponsorship opportunities for female students.

References

- Ajayi, O., & Oladimeji, K. (2020). Financial Barriers to TVET Participation among women in Nigeria: Policy implications Policy Implications. *Nigerian Journal of Educational Development*, 7(2), 102-117.
- Ayub, A. (2017). Participation of women in technical and vocational education and training in South Asia: Issues and challenges. *International Journal of Vocational Education and Training*, 25(2), 55–68.
- Bengesai, A., & Paideya, V. (2018). Factors influencing female dropout rates in South African technical and vocational education. *Journal of Vocational Education Research*, 43(3), 210–227.
- Best, J. W., & Kahn, J. V. (2015). *Research in education* (10th ed.). Pearson.
- Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches* (3rd ed.). SAGE Publications.
- Denzin, N. K., & Lincoln, Y. S. (2018). *The SAGE handbook of qualitative research* (5th ed.). SAGE Publications.
- Haralambos, M., & Holborn, M. (2018). *Sociology: Themes and Perspectives* (9th ed.). Collins Educational.
- International Labour Organization (ILO). (2020). *World employment and social outlook: Trends 2020*. ILO Publishing.
- Marriam, S. B. (2009). *Qualitative research: A guide to design and implementation*. Jossey-Bass.
- Moyo, L., Sankhulani, L., & Namalima, T. (2021). Socio-economic determinants of gender disparities in technical colleges in Malawi. *African Journal of Technical Education and Development Studies*, 8(1), 33–49.
- Federal Government of Nigeria (2013). *National Policy on Education*. Abuja, FME Press
- Ngugi, J., & Muthima, P. (2017). Gender disparity in technical and vocational education and training in Sub-Saharan Africa. *Journal of Education and Practice*, 8(10), 222–228.
- Okafor, C. (2021). Financial barriers and gender disparity in technical education in Rivers State, Nigeria. *Nigerian Journal of Technical Education Research*, 14(2), 77–91.
- Okolocha, C. C., & Nwadiani, M. (2015). Technical and vocational education and training as a tool for national sustainable development in Nigeria. *Journal of Education and Practice*, 6(32), 188–191.

- Petr, N. I, Johnson, V.M, Francis, E & Tukur, N. M (2025). Gender diversity in technical and vocational education in Nigerian Colleges of Education: Challenges and opportunities. *Journal of Theoretical and Empirical Studies in Education* Vol. 10 Issue 2 retrieved on 23-8-2025 from <https://journals.unizik.edu.ng/jtese>
- Rao, C.N.S. & Chand, C. (2019). *Sociology: Principles of Sociology with an Introduction to Sociological Thought*. New Delhi, S. Chand and Company Limited
- Research Advisors. (2006). Sample size table. Retrieved from <http://www.researchadvisors.com/tools/SampleSize.htm>
- Shahidul, S., & Karim, A. (2015). Factors contributing to school dropout among girls: A review of literature. *Asian Social Science*, 11(12), 98–110.
- United Nations. (2023). *World population prospects 2022: Summary of results*. Department of Economic and Social Affairs, Population Division.
- UNESCO. (2021). *Global education monitoring report 2021/2: Non-state actors in education*. UNESCO Publishing.
- Williams, M., Becky, T., & Theophilus, D. (2018). The role of vocational and technical education in economic development. *Journal of Technical Education Research*, 11(2), 20–29.
- World Bank. (2022). *Closing Gender Gaps in STEM Education and Careers: Global Trends and Policy Actions*
- Yakubu, M., & Abubakar, S. (2022). Educational investment patterns in Northern Nigeria: The role of household resources in shaping gender disparities. *Journal of African Education Studies*, 9(3), 142–157.