Addressing Gender Inequalities in TVET: Promoting Participation and Empowerment for Women

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ABSTRACT
This research examines gender disparities in Technical and Vocational Education and Training (TVET) by analyzing enrollment patterns, completion rates, and employment outcomes disaggregated by gender. Using secondary data from the World Bank Gender Statistics, the study employs descriptive statistics, visualization tools, and regression analysis to examine these disparities. Findings reveal significant inequalities: male employment values exhibit greater variability compared to female employment, as shown by standard deviations of 1.64 and 0.17, respectively. Equally, male educational attainment shows higher variability (2.03) than female attainment (1.50). Regression analyses demonstrate a statistically significant positive relationship between female enrollment and attainment on educational outcomes, with female attainment accounting for 90.25% of variability in the response variable. Conversely, no significant relationship was found between female employment and TVET-related employment outcomes. These results highlight persistent gender disparities in TVET, particularly in employment, while highlighting the positive impact of female educational attainment on reducing inequalities. The discoveries advocate for targeted interventions to enhance female participation and equity in TVET programs.

Keywords: Gender inequalities, Technical and Vocational Education and Training (TVET), Enrollment rates, Gender disparities,

1.0 INTRODUCTION AND LITERATURE REVIEW

TVET plays an essential role in preparing individuals with the skills and aptitudes needed to fully thrive in the labor market. However, women continue to face more impediments and challenges in accessing and completing TVET programs, as well as in securing employment opportunities in related fields. This research work greatly seeks to explore into the gender inequalities within TVET, analyzing enrollment patterns, completion rates, and employment outcomes, while also exploring strategies to overcome barriers and promote gender equality in TVET. The objectives of this research are to; Assess the extent of gender inequalities in TVET enrollment rates, completion rates, and employment outcomes and explore effective policies and interventions for promoting gender equality and women's empowerment in TVET.

Additionally, identification of key gender inequalities within TVET programs, including enrollment inequities, completion rates, and employment rate outcomes. Perceptions into the socio-economic, cultural, and institutional factors contributing to gender gaps in TVET participation and outcomes. The hypothesis of this study aims to explore whether gender inequalities exist within TVET programs and whether women face obstacles that hinder their enrollment, completion, and employment outcomes compared to men.

Null Hypothesis (H_0): There is no significant difference in TVET enrollment, completion rates, and employment outcomes amongst genders.

Alternative Hypothesis (H_1): Gender inequities in TVET enrollment, completion rates, and employment outcomes.

Despite the increasing recognition of the importance of Technical and Vocational Education and Training (TVET) in fostering economic growth and social development, gender inequalities persist in TVET participation, completion rates, and employment outcomes. This research aims to explore the gender gaps within TVET programs, examining factors contributing to inequalities and identifying strategies to promote gender equality and women's empowerment in TVET.

By addressing these inequities, we aim to create more inclusive and evenhanded pathways to economic opportunities and social advancement. Gender inequalities in African education refer to the unequal access to educational opportunities,

resources, and outcomes between males and females on the African continent. These inequalities manifest in various forms and are influenced by socio-cultural, economic, and institutional factors. some key points to consider are as follows; Enrollment inequalities, notwithstanding progress in recent years, gender gaps persist in school enrollment rates across many African countries. Additionally, girls continue to enroll in schools at about lower rates than boys in several regions of the country, especially in secondary and university education. Access to decent female education may have obstacles to receiving a decent education even if they do enroll in school. Factors including cultural diversity, distance to schools, poor transportation and infrastructural lacks also may be disproportionated to women's access to educational resources and facilities. Educational Attainment on the average, males tend to have higher levels of educational attainment compared to girls in many African countries. This inequality sometimes confines opportunities for higher education and economic empowerment for these women. Closing the gender gap in education has significant socio-economic benefits, including higher workforce participation, improved health outcomes, and greater social and political empowerment for women. While progress has been made in narrowing gender inequalities in education, challenges persist, including funding constraints, cultural resistance, and conflict-related disruptions. However, there are also opportunities for collaboration, innovation, and investment in girls' education to drive positive change. Overall, addressing gender inequalities in African education requires multi-faceted approaches that address structural barriers, promote gender equivalence and social inclusion, and empower girls and women to fulfill their potential through education. This research on gender transformations in educational attainment in Africa emphasizes the complexity of the issue. Research has revealed that the main causes of gender differences in enrollment, retention, and educational attainment include sociocultural norms and practices, institutional hurdles, and economic limitations (UNESCO, 2020; Oduro & Takyi, 2019).

For example, early marriage, domestic duties, and cultural perceptions about women's roles sometimes restrict girls' access to higher education and degrees (Adegbija & Omowunmi, 2018). In additional context, incongruities in educational attainment are somwhat results of economic issues such as poverty and restricted access to fundamental resources (Nwagwu, 2017). Gender inequities in education are even more intensified by institutional issues such as gender biases in curriculum and pedagogy, teacher shortages, and inadequate infrastructure (Akyeampong et al., 2013). The obscure interaction of socio-cultural, economic, and institutional issues is reflected in the gender gaps in education in Africa. Although there has been an increase in the number of boys and girls enrolled in elementary school, gender inequalities are still quite noticeable in secondary and university education (UNESCO, 2020). Compared to males, girls are still less likely to start school, finish their education, or seek further education (Adegbija & Omowunmi, 2018). In addition, females from underprivileged backgrounds, remote locations, and conflict-affected areas have further obstacles to their education (Nwagwu, 2017). These differences restrict girls' and women's abilities to fully engage in society and exacerbate larger socioeconomic gaps. In Africa, gender differences in education have a significant socioeconomic influence. Economic growth is hampered because poverty cycles are perpetuated by limited access to high-quality education (Oduro & Takyi, 2019). According to Akyeampong et al. (2013), girls who are denied an education are more likely to marry early, have high childbearing rates, little economic options, all of which should contribute to intergenerational cycles of poverty. On the other hand, spending money on womens education has a large positive socioeconomic impact, as demonstrated by better health outcomes, lower rates of mother and child mortality, and superior rates of employment participation and productivity (UNESCO, 2020). A multifaceted strategy that targets the root causes of inequality and encourages gender-responsive policies and initiatives is needed to overcome gender inequalities in education. Legislation and policy frameworks are among the most important policy interventions and best practices. establishing and upholding rules and regulations that safeguard girls' access to an education and advance gender equality in the classroom (Adegbija & Omowunmi, 2018). Investing in Resources and Infrastructure: Rebuilding school buildings, allocating sufficient funding, and removing obstacles to admission, such as a shortage of restrooms and a long commute to school (Nwagwu, 2017). Gender Sensitization and Teacher Training; helps in focusing gender biases in the educational prospectus, encouraging gender-sensitive teaching and learning settings, and offering teacher training on gender sensitive approaches (Oduro & Takyi, 2019). Advocacy and Community Engagement: Including parents, religious leaders, and communities in campaigns to alter public perceptions and actions around girls' education (Akyeampong et al., 2013). Scholarships and Financial Assistance: Enabling girls from underprivileged families to access and finish their education via the provision of scholarships, bursaries, and financial assistance (UNESCO, 2020).

TVET institutions must establish a gender-inclusive atmosphere. Additionally, gender consideration must be incorporated into curriculum development and learning materials, as well as into any TVET-related activities that collect sex-disaggregated data. In the TVET sectors, intentional steps must be taken to advance or appoint qualified women to positions of authority and influence, or to decision-making roles. In 2019, Munyi, F. W., and Cheruiyot, S. According to Jwasshaka, S. K., and Fadila, N. (2020), giving TVET institutions of learning priority will help reduce Nigeria's unemployment issue. Furthermore, they pushed for the insertion of skill-training modules in Nigeria's curricula at all educational levels to effectively prepare graduates for the workforce beforehand.

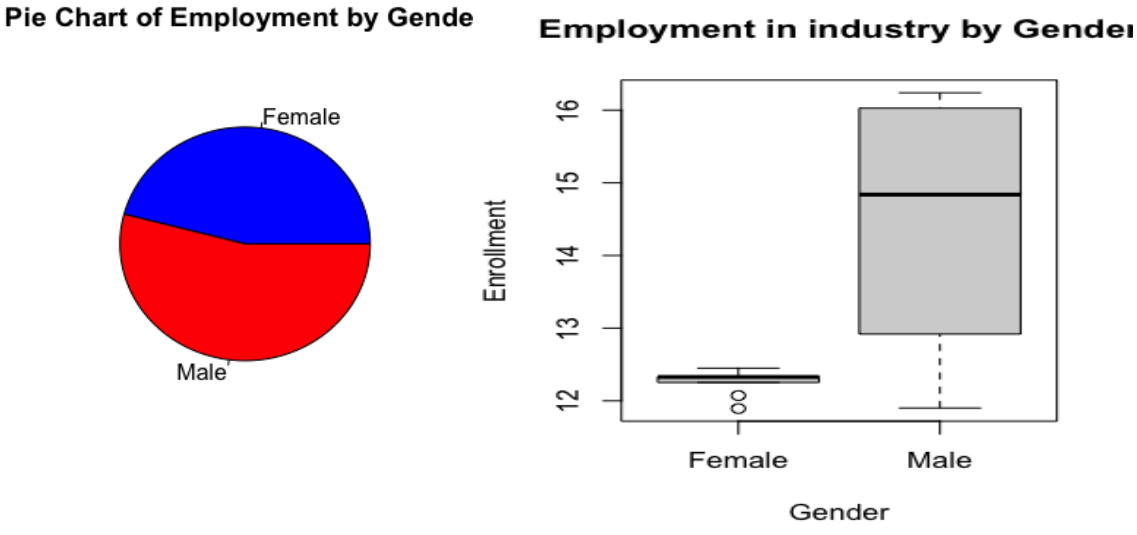
2.0 MATERIALS AND METHODS

This research employs a quantitative analysis and analysis. Secondary data was collected through the gender data of the World bank, to examine enrollment patterns, completion rates, and employment outcomes disaggregated by gender to gain insights into the underlying factors shaping gender inequalities and to identify promising practices and interventions. Descriptive statistics was run by the aid of pie chart, visualization of the data was done with the use of the box plot. Regression analysis was also employed to examine the relationship between gender (independent variable) and TVET participation rates, completion rates, or employment outcomes (dependent variables), while monitoring for potential confounding factors such as age, education level, and socio-economic status.

Table 1.0: Gender employment in industry for 10 years (2014 -2023)

Employment in industry	Female Employment	Male Employment
2014	12.44232854	11.90097493
2015	12.44928588	12.45810129
2016	12.33142611	12.91873978
2017	12.25238664	13.59062103
2018	12.07225493	14.42730577
2019	11.89320278	15.24759921
2020	12.27963957	15.66528658
2021	12.32854552	16.02746439
2022	12.33176869	16.23936722
2023	12.32689817	16.14556541

Source: https://databank.worldbank.org/source/gender-statistics#



According to the research, the employment standard deviation for the data was 1.640657 for males and 0.1691713 for women in the workforce. The interpretation draws attention to the inequalities in the employment values that exist between men and women in the workforce. In contrast to female employment values, which show less variation around their mean value, male employment values are more variable, as seen by the higher standard deviation for men.

	Coefficient	**Standard Error**	***t*-value**	**p-value**
Intercept	55.451	39.503	1.404	0.198
Female_employment	-3.340	3.219	-1.038	0.330

Residuals: Min (-1.9881), 1st Qrt (-1.2388), 3rd Qrt (1.6279), Max (1.9810)
Residual standard error: 1.634 on 8 degrees of freedom
Multiple R^2: 0.1186, Adjusted R^2: 0.008463
F-statistic: 1.077 on 1 and 8 DF, p-value: 0.3298
Both p-values are higher than the typical significance level of 0.05, indicating that the coefficients are not statistically significant, according to the interpretation.

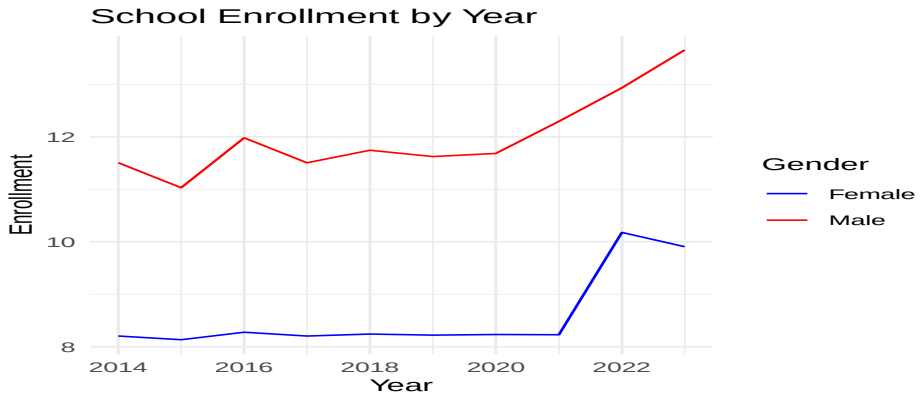
The F-statistic evaluates the model's overall significance. The model is not statistically significant, as indicated by the p-value of 0.3298 that is connected to the F-statistic.
The non-significant coefficients and model fit statistics collectively suggest that there is not much evidence in favour of a link between female employment and the response variable in the regression model.

Table 2.0: Tertiary School Gender Enrollment for 10 years (2014 -2023)

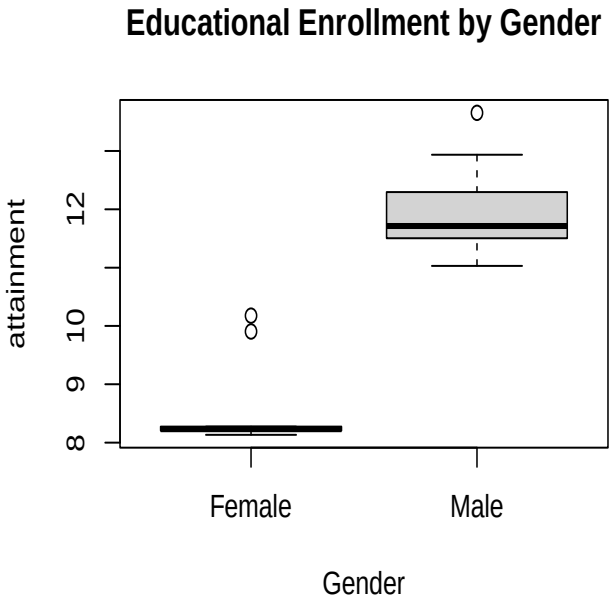
School enrollment, tertiary	**Female**	**Male**
2014	8.205334664	11.50526524
2015	8.133879662	11.02968025
2016	8.276789665	11.98085022
2017	8.205334664	11.50526524
2018	8.241062165	11.74305773
2019	8.223198415	11.62416419
2020	8.232130291	11.68361096
2021	8.227664353	12.29390812
2022	10.17770767	12.93429947
2023	9.905818939	13.65351677

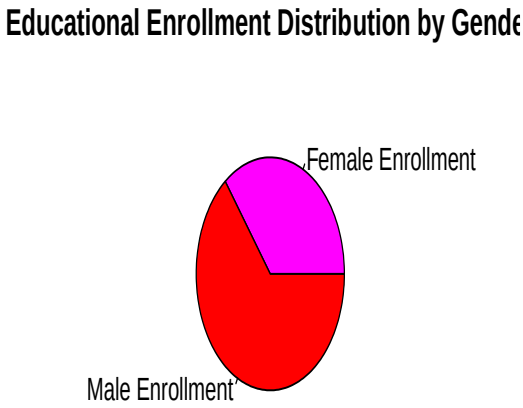
Source: https://databank.worldbank.org/source/gender-statistics

The standard deviation for female enrollment is 0.772401, whereas the standard deviation for male enrollment is 0.7768874, according to the research. Based on their equal standard deviation values, the interpretation



Shows that the enrollment numbers for men and women both show similar degrees of variability in their enrollment.





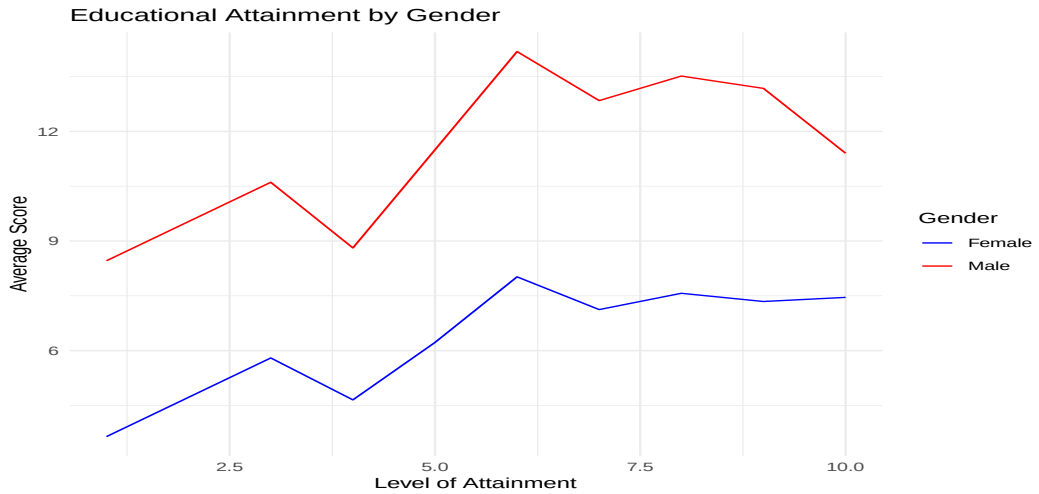
Residuals: Min (-0.57079), 1st Qrt (--0.15805), 3rd Qrt (0.20310), Max (0.61096)
Residual standard error: 1.634 on 8 degrees of freedom
Multiple R^2: 0.1186, Adjusted R^2: 0.008463
F-statistic: 1.077 on 1 and 8 DF, p-value: 0.3298
The F-statistic tests the overall significance of the model. The p-value associated with the F-statistic is 0.0009334, indicating that the model is statistically significant.

In summary, the regression model suggests that female enrollment has a statistically significant positive effect on the response variable. About 76.46% of the variability in the response variable can be explained by female enrollment, and the model is statistically significant.

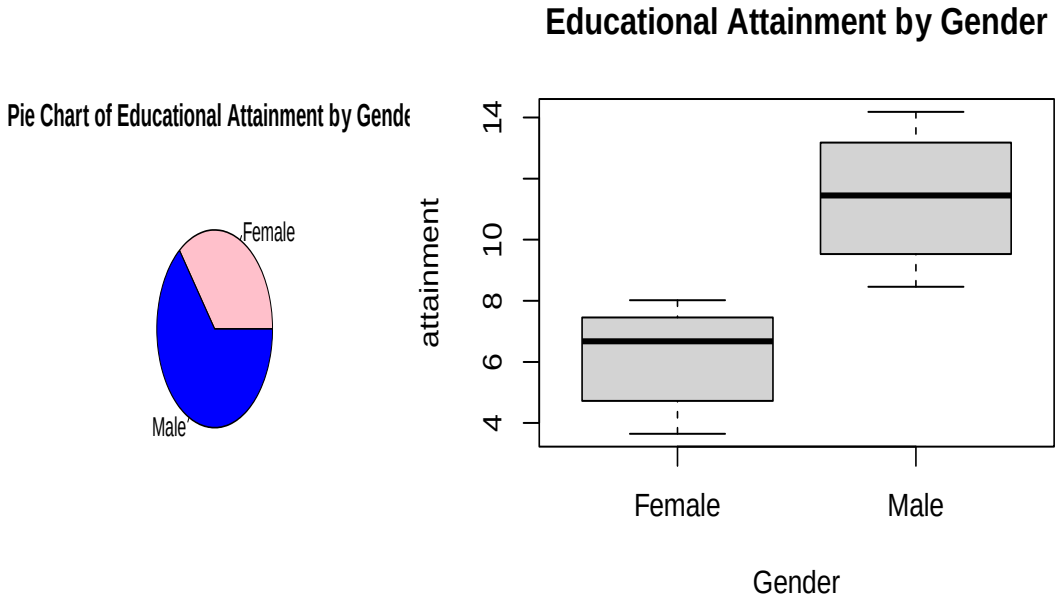
Table 3.0: Gender-based educational attainment for 10 years (2014 -2023)

Educational attainment	Female	Male
2014	3.647160053	8.459409714
2015	4.723446648	9.53323322
2016	5.799779892	10.60706043
2017	4.651979923	8.809940338
2018	6.223866622	11.49812331
2019	8.019619942	14.18612957
2020	7.121743282	12.84212644
2021	7.570681612	13.51412801
2022	7.346212342	13.17812723
2023	7.458446977	11.40314203

Source: https://databank.worldbank.org/source/gender-statistics#



The analysis showing the standard deviation for attainment levels in the data showed 2.026275 for male and 1.496645 for the female educational attainment. This analysis suggests from the data that there is a higher degree of variability in male employment values compared to female employment values in the employment industry, as corroborated by the higher standard deviation for males.



	Coefficient	Standard Error	*t*-value	p-value
Intercept	**3.3562**	**0.9587**	**3.501**	**0.00807 ****
Female_attainment	**1.2862**	**0.1494**	**8.607**	**2.57E-05 *****

Conclusively, the regression model distinctively reveals that the response variable is positively impacted and statistically significant towards female achievement. As a result, female attainment accounts for around 90.25% of the variability in the response variable, and assuring the model is statistically significant.

4.0 CONCLUSION AND RECOMMENDATION

The research reveals persistent gender disparities in TVET enrollment, educational attainment, and employment outcomes. Female

attainment significantly influences educational progress, but workforce inequalities remain distinct, with male employment showing greater variability and higher rates. Addressing these disparities necessitates putting in place gender-sensitive TVET regulations that promote female enrollment, granting women legitimate access to education, and developing programs that equip them with marketable skills. Governments and other stakeholders should also use data analysis to track progress, raise public awareness of gender equity, and create inclusive policies that guarantee equal opportunity in the fields of work and education.

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