



VOCATIONAL EDUCATION ENROLMENT AND UNEMPLOYMENT IN NIGERIA: EVIDENCE FROM ARDL BOUNDS TESTING APPROACH, 1980–2024

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Abstract

The study examined the contribution of vocational education to reducing unemployment in Nigeria using an ex post facto design based on secondary data. Annual time series data covering 45 observations (1980–2024) were sourced from the National Bureau of Statistics (NBS, 2024), including vocational education enrolment, unemployment rate, and population growth. The analysis was conducted using Stata 17.0. The Phillips-Perron unit root test was applied to ensure stationarity and avoid spurious regression. The Autoregressive Distributed Lag (ARDL (2,1,1)) model was then estimated to assess both short-run and long-run relationships. The bounds test provided weak and borderline evidence of cointegration, leading to the acceptance of the null hypothesis of no long-run relationship. Despite a strong model fit ($R^2 = 0.9327$), the results show that unemployment has no significant effect on enrolment. In the long run, unemployment has a marginal positive effect, while population is insignificant. In the short run, enrolment is driven by its past values and negatively affected by population growth. Overall, enrolment is influenced more by past trends and demographic pressure than by unemployment. The study recommends increased government investment in vocational education.

Keywords: Vocational Education, Unemployment, Population growth, Nigeria

Introduction

Nigeria, despite its abundant natural resources and large population, continues to grapple with rising unemployment. For instance, the Nigerian Economic Summit Group (2024) reported that the unemployment rate increased to 5.3% in the first quarter of 2024, which raised the nation's "misery index" to 36.9%. Youth unemployment remains a major concern, particularly among post-secondary graduates (9%), compared to those with secondary education (6.9%) and primary education (4%), suggesting a persistent mismatch between graduates' skills and labour market needs (Adewole, 2025).

The rising youth unemployment rate has been linked to social vices such as militancy, kidnapping, and other forms of restiveness (Maduka, 2015). Beyond the human costs, this situation undermines economic development and can threaten national stability. A key driver of this challenge is the disconnect between formal education and the practical competencies required by employers and industries (Adamaagashi et al., 2023).

In line with this concern, the National Policy on Education (FRN, 2004) explains that vocational education is designed to equip learners with practical and applied skills for occupational life. It therefore serves as a potentially effective pathway for improving employability and supporting sustainable development. However, the effective contribution of vocational education to labour-market outcomes remains limited in Nigeria due to challenges such as inadequate funding, poor infrastructure, outdated curricula, and negative societal perceptions of vocational careers (Kehinde & Olasupo, 2017; Korter, 2023). Consequently, strengthening vocational and technical education is essential for reducing unemployment and improving Nigeria's economic resilience.

In view of the foregoing, this study, "Vocational Education Enrolment and Unemployment in Nigeria: Evidence from Johansen Cointegration Analysis, 1980–2024" focuses on empirically examining the long-run and short-run relationship between vocational education enrolment and unemployment in Nigeria using Johansen cointegration analysis over the 45 years period. The study is expected to provide time-bound evidence that can inform vocational education policy reforms aimed at reducing youth unemployment and strengthening Nigeria's labour-market outcomes.

Research Objectives

1. To analyse the relationship between vocational education enrolment and the unemployment rate in Nigeria.
2. To examine the effect of vocational education on unemployment and population growth in Nigeria.

Research Questions

1. What is the relationship between vocational education enrolment and the unemployment rate in Nigeria?
2. How does vocational education affect unemployment and population growth in Nigeria?

Hypotheses

H₀₁: There is no significant relationship between vocational education enrolment and the unemployment rate in Nigeria.

H₀₂: Vocational education has no significant effect on unemployment and population growth in Nigeria.

Conceptual Clarification

Concept of Vocational Education

Vocational education, as defined by the Federal Government of Nigeria (2014), equips individuals with practical skills and training for specific trades or professions, preparing them for employment through technical and hands-on experience. Similarly, indeed (2025) views it as career-focused training that prioritizes practical learning over academic theory, while English (2025) describes it as specialized education designed to prepare students for specific vocations and direct entry into the workforce.

Concept of Unemployment

According to the International Labour Organization (ILO, 2020), unemployment refers to the situation in which individuals who are willing and able to work cannot find employment despite actively seeking it, usually measured as the percentage of the labour force that is jobless and seeking work. Similarly, Ndzwayiba (2020) defines an unemployed person as someone of working age who is jobless, available for work, and actively searching for employment. Chappelow (2020) adds that unemployment occurs when individuals actively seeking jobs cannot find work, serving as an indicator of a nation's economic health.

Causes of Youth Unemployment

Kakwagh and Agnes (2010) identified population growth, lack of employable skills, limited youth participation in decision-making, and negative perceptions of employment as major causes of youth unemployment in Nigeria. In addition, economic downturns, skill mismatch, and inadequate education and training reduce job opportunities for young people. Poor infrastructure and weak job creation in both public and private sectors further worsen youth unemployment (World Bank, 2025; ILO, 2025).

Implications of Youth Unemployment on Socio-Economic Development in Nigeria

Youth unemployment poses serious challenges to Nigeria's socio-economic development. It leads to wasted human capital and lost productivity as young people remain unable to contribute effectively to economic growth (Olaleye, 2019). High unemployment rates also fuel social unrest, crime, and insecurity. Furthermore, limited job opportunities drive skilled youths abroad, resulting in brain drain and loss of valuable human capital. Unemployment fosters economic dependency, increasing reliance on family or government support and straining welfare systems (Ullah, 2020). Lastly, persistent joblessness discourages investment in education and skills development, weakening human capital formation (Njifen, 2023).

Vocational Education as a Strategy for Reducing Unemployment in Nigeria

Vocational education plays a vital role in reducing unemployment in Nigeria by providing practical, job-oriented skills that enhance productivity and self-reliance. According to the National Policy on Education (FRN, 2004), it equips learners for productive engagement in sectors such as technology, agriculture, and construction, thereby promoting job creation. Korter (2023) noted that vocational training fosters self-employment and small business

development among youths. Similarly, under the Technical and Vocational Education and Training (TVET) initiative, the Federal Government is training nearly one million youths across 2,600 centres nationwide, focusing on 90% practical learning in trades like fashion, livestock production, and plumbing (Anyanwu, 2025). Abdullahi et al. (2026) and Wami (2020) also emphasized that vocational programmes in trades such as sewing and soap making enable income generation and entrepreneurship, making vocational education a key driver of employment and sustainable growth in Nigeria.

Theoretical Framework

This study is supported by Becker's Human Capital Theory (1964). According to the theory, investing in education and training is essential for improving people's employability, productivity, and efficiency. According to Becker, when people or societies spend money on education, especially education that focuses on skills like technical and vocational training, they gain knowledge and skills that increase their ability to conduct economic activities more successfully. This is why vocational education is such an important means of giving people the technical and practical skills that employers demand. The theory implies that a higher level of participation and quality in vocational education should correspond to a lower unemployment rate, as more individuals become adequately prepared for productive employment or self-reliant ventures. Conversely, inadequate vocational training or misalignment between skills acquired and labour market needs can lead to persistent unemployment, particularly among the youth population.

Empirical Review

Ayoade et al. (2020) examine the effect of vocational education on unemployment in Nigeria using a compartmental mathematical model. The study formulates and validates a structured model of labour flows, derives unemployment-free and unemployment-endemic equilibria, and computes a threshold condition for effective vocational-education implementation, analogous to an epidemic threshold. Stability analysis shows that the unemployment-free equilibrium is locally stable when the threshold condition is satisfied. Numerical simulations, parameterised with available data and assumptions, predict that Nigeria's unemployment rate will continue to rise unless vocational education is revitalised and effectively implemented.

Opuala-Charles and Oshilike (2023) apply the ARDL bounds-testing approach to examine the effect of education investment and related variables on unemployment in Nigeria over 1991–2021. The results show that, while labour-force participation is statistically significant, government recurrent expenditure on education has an insignificant positive relationship with unemployment in the long run, and credit to the private sector, school enrolment rate, and gross fixed capital formation, though correctly signed, are also statistically insignificant, leading the authors to recommend stronger fiscal policy and better-quality education and vocational training.

Zimmermann, et al. (2013). This paper focuses on the determinants of the labour market situation of young people in developed countries and the developing world, with a particular emphasis on the role of vocational training and education policies. We highlight the role of demographic factors, economic growth and labour market institutions in explaining young people's transition into work. Subsequently, we assess differences between the setup and functioning of the vocational education and training policies across major world regions as an important driver of differential labour market situation of youth. Based on our analysis, we argue in favour of vocational education and training systems combining work experience and general education and provide some policy recommendations regarding the implementation of education and training systems adapted to a country's economic and institutional context.

Yoana, Auwalin & Rumayya (2024) examined the role of vocational education on unemployment in Indonesia following the expansion of vocational high schools. Using cross-sectional data from the 2019 Indonesian National Labour Force Survey and applying logit and probit models, the study focused on individuals with secondary education while controlling for age, age squared, gender, residence, and marital status. The findings reveal that vocational education significantly reduces the probability of unemployment compared to general education. However, the effect is weaker among recent graduates, suggesting short-term adjustment challenges.

Methodology

The study adopted an ex post facto research design based on existing secondary data that could not be manipulated by the researcher (Isiaq & Abdullahi, 2025). Annual time series data covering 1980–2024 were sourced from the National Bureau of Statistics (NBS, 2024) and included vocational education enrolment rate, unemployment rate, and population growth in Nigeria. To test the hypotheses, the Phillips-Perron unit root test was conducted to determine data stationarity and prevent spurious regression results. After establishing the integration order, the Johansen Cointegration model was estimated using Stata 17.0, as it effectively captures the dynamic relationships among variables without imposing prior causality assumptions. The model was adapted from Okolie and Eze (2025) and is specified as:

$$UNEMP_t = \alpha_0 + \beta_1 VOED_t + \gamma POP_t + \mu_t$$

Where:

UNEMP_t: Unemployment rate at time t

VOED_t: Vocational education enrolment rate at time t

POP_t: Population growth rate at time t

α_0 : Constant term

β_1 : Coefficient for vocational education

γ : Coefficient for population growth

μ_t : Error term

This model examines how changes in vocational education enrolment and population growth dynamically influence unemployment rates in Nigeria over time, thereby revealing the direction and strength of their interrelationships.

Results

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Year	45	2002.00	13.13	1980	2024
Population growth	45	2.65	0.15	2.39	3.11
Unemployment rate	45	4.25	0.65	3.07	5.71
Voluntary education	45	956,672	775,328.10	216,726	2,780,000

National Bureau of Statistics (NBS, 2024)

The table shows descriptive statistics for 45 observations. The average year is 2002, with values ranging from 1980 to 2024, indicating a wide time span covered in the dataset. Population has a mean of 2.65 and a low standard deviation of 0.15, suggesting that the values are relatively close to the average.

Table 2: Phillips–Perron Unit Root Test (vol_edu)

Variable	Test Statistic Z(t)	5% Critical Value	P-value	Decision
vol_edu	-6.907	-2.947	0.0000	Stationary

The Phillips–Perron test shows that vol_edu is stationary at level, as the test statistic (−6.907) is more negative than the 5% critical value (−2.947) and the p-value is significant. This implies the variable is I(0) and suitable for ARDL analysis.

Table 3: Phillips–Perron Unit Root Test for d_unemployment_rate

Test Statistic	Value	1% Critical Value	5% Critical Value	10% Critical Value
Z(rho)	-32.175	-18.424	-13.076	-10.560
Z(t)	-3.884	-3.628	-2.950	-2.608

The Phillips–Perron unit root test results indicate that the differenced unemployment rate (d_unemployment_rate) is stationary at conventional significance levels. Specifically, the Z(t) statistic (−3.884) is more negative than the critical values at 1%, 5%, and 10%, and the associated p-value (0.0022) is less than 0.05. This leads to the rejection

of the null hypothesis of a unit root. Therefore, the series is stationary after first differencing, implying it is integrated of order one, $I(1)$.

Table 4: Phillips–Perron Unit Root Test Result for *pop*

Variable	Test Statistic (Z(t))	1% Critical Value	5% Critical Value	10% Critical Value	p-value	Decision
Pop	-3.018	-3.621	-2.947	-2.607	0.0332	Stationary at 5%

The Phillips–Perron unit root test result for *pop* shows a test statistic of -3.018, which is more negative than the 5% critical value (-2.947) and the 10% critical value (-2.607), but less negative than the 1% critical value (-3.621). Additionally, the p-value of 0.0332 is less than 0.05. This indicates that the null hypothesis of a unit root is rejected at the 5% level of significance.

Table 5: ARDL–ECM

Component	Variable	Coef.	P-value
Adjustment (ECM)	L1.vol_edu	-0.0242	0.002
Long-Run (LR)	d_unemployment_rate	638,298	0.060
	Pop	-116,784.6	0.907
Short-Run (SR)	LD.vol_edu	0.6322	0.000
	D.unemployment_rate	775.74	0.863
	D.pop	-97,638.64	0.004

The ARDL (2,1,1) results show a strong model fit ($R^2 = 0.9327$) with weak and borderline evidence of a long-run relationship. In the long run, unemployment rate has a marginal positive effect while population is insignificant, whereas in the short run, vocational education enrolment is strongly driven by its past values and negatively affected by population, with unemployment remaining insignificant. Overall, enrolment is more influenced by past trends and demographic pressure than by unemployment conditions.

Discussion of findings

The ARDL results show weak long-run evidence at the 10% level with slow adjustment to equilibrium. Unemployment has a marginal but insignificant effect on vocational education enrolment, while population is insignificant in the long run but negatively significant in the short run. These findings are strongly supported by recent empirical studies. Anakwuba and Ezenekwe (2024) found that vocational education contributes to long-term economic improvement, but its short-run effects are weak and inconsistent, matching the weak long-run evidence in this study. Similarly, Opuala-Charles and Oshilike (2023) established that the impact of education on unemployment is time-dependent and not immediate, which aligns with the lagged adjustment observed in the ARDL results. In the same direction, Kareem et al. (2024) reported that TVET improves employability outcomes, but its effectiveness depends on structural conditions such as funding and institutional quality, consistent with the insignificance of unemployment in driving enrolment. Furthermore, Kevin-Chinweike (2024) emphasized that TVET outcomes are largely influenced by institutional and policy support rather than direct labour market pressures, which supports the finding that enrolment is not strongly responsive to unemployment changes.

Conclusion

The study concludes that vocational education shows limited evidence of a long-run relationship with unemployment in Nigeria, as indicated by the ARDL results. While there is weak support for long-run effects, the adjustment toward equilibrium is slow but significant. In the long run, unemployment exhibits only a marginal positive influence on vocational education enrolment, whereas population does not have a significant effect. In the short run, enrolment is largely driven by its past values, and population exerts a significant negative influence, while unemployment remains insignificant. Overall, although vocational education contributes to human capital development, its direct impact on reducing unemployment is not strongly established, suggesting the need for complementary policies to enhance its effectiveness in promoting sustainable employment and inclusive economic growth in Nigeria.

Recommendations

1. The government should provide adequate funding and modern facilities to strengthen vocational education and enhance training quality.

2. Vocational institutions should collaborate with industries to design programmes that align with current labour market demands.
3. The curriculum should integrate entrepreneurship and technical skills to make graduates more employable and self-reliant.
4. The government should launch a well-coordinated campaign on the need and significance of vocational education programmes as a panacea for job creation.

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