



**International Journal of Economics,
Environmental Development and Society
(IJEEDS)**

THE NEXUS BETWEEN HUMAN CAPITAL DEVELOPMENT AND ECONOMIC GROWTH IN NIGERIA (1992-2024)

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ABSTRACT

This study investigated the impact of human capital development on the economic growth process between 1992 and 2024, as measured by federal government expenditure on health, education, gross fixed capital formation, primary, secondary, and tertiary institutions enrollment and other social and community services. Secondary data gathered from CBN publications served as source of data for the study. The Autoregressive Distributed Lag (ARDL) Bounds Testing Method for Co-integration was used in the study. The estimated long-run relationship demonstrated the beneficial impact of human capital development on Nigeria's economic growth. However, in comparison to the contributions of physical capital formation, the influence is minimal. It was discovered that there was positive significant impact of expenditure on health, education, gross fixed capital formation, primary, secondary, and tertiary institutions enrollment on economic growth in Nigeria. Based on the findings of the study, it was recommended among others that the government of Nigeria should actively promote the development of labor-intensive businesses, reorganize the educational system, and implement sound governance in order to achieve sustained economic growth.

Keywords: Nexus, Human Capital, Development, Economic Growth, Health, Education.

Reference to this paper should be made as follows:

Udu, M. O. (2025). The nexus between human capital development and economic growth in Nigeria (1992-2024). *International Journal of Economics, Environmental Development and Society*, 6(4), 721-730.

Copyright © IJEEDS 2025 [ISSN: 2992-5614]. DOI: [10.5281/zenodo.18023225](https://doi.org/10.5281/zenodo.18023225).

INTRODUCTION

With a population of over 232.7 million (World Bank, 2024) and a land area of roughly 923,800 square kilometers, Nigeria is one of the few countries in the world that has an abundance of natural and human resources for development. In order to effectively utilize the nation's abundant natural resources for economic growth, investments in human capital were required. A country's economic growth and development have been demonstrated to be favorably correlated with investments in human capital (Gbosi, 2016).

However, it has been argued by Omotor (2023) that human capital development increases the income of the poor in a country, hence increasing the income gap between the rich and the

poor, which is, of course, a global macroeconomic goal. Simplified, this means that human capital development not only helps with the effective distribution and civilization of scale resources, but it also fosters equity and lessens poverty. Additionally, it has been suggested that concerns of education and economic growth and development are intimately related to the development of human capital. Human capital, which is a combination of health, education, knowledge, skills, attitudes, expertise, and technological know-how, has a major role in economic growth and development (Nwankwo, 2021).

Human capital theorists believe that education, as an investment in human capital, pays off in the form of increased lifetime wages for the person as well as increased productivity in the country's economy. According to the human capital theory, which was developed by Schultz (1960), modified by Gunderson and Raddell (1980), and reported by Nafziger (2020), investments in human capital include the following:

- All expenditures on health facilities and services that impact and enhance a people's life expectancy, strength and stamina, and rigor and vitality.
- On-the-job training, including traditional apprenticeship programs run by businesses.
- Primary, post-primary, and postsecondary education that is formally organized, including research.
- Adult education programs that are not run by businesses, such as extension programs, particularly in agriculture, and
- Individuals and families migrate and look for work to adapt to shifting employment prospects.

Thus, the investment theory extended to human resources is known as the human capital theory. It makes the assumption that expenditures made by people and society to provide health care, education, and other services tend to boost their future productive capacity at the expense of present consumption. In the same way that investments in factories and machinery generate future output and revenue for businesses, investments in health care, education, and other services that protect the environment and, in fact, eradicate poverty also produce knowledge and skills, aptitude and talents, vigor and strength, and future earnings for both individuals and society. Education and health have a symbolic relationship just as they both contribute to economic growth and development (Omotor, 2023).

However, the extent to which government is disposed to spending in education, health care delivery services and poverty eradication largely determines how well they can contribute to economic growth and development. Awaritefe (2018) and Nwadiani (2018) provided concise explanation of this fact. The authors emphasized that a nation's labor force is an essential part of its foundation for economic growth and development, and that the quality and level of education and training that a nation's labor force possesses greatly influences the extent to which that nation's development potential is realized. Therefore, a nation will undoubtedly not be able to grow economically or in any other way if it is unable to develop and use the talents and knowledge of its human resources.

Furthermore, some studies on a number of developing countries have also reported weak evidence to support the view that human capital development necessarily improves economic growth (Pritchett, 2016; Vinokur, 2020). This idea is supported by three arguments: education labor may be linked to social waste and counterproductive activities; excess supply may result in

a reduction in the rate of return; and education may not always spark cognitive abilities. Pritcnett's (2016) work provides extensive documentation of these points.

The role of human capital development in the economic growth and development process has however been recognized by the local, state and federal government of Nigeria. Human capital development has been recognized by the Federal and States' Government through various skills and acquisition programmes in the states across the federation. In a same vein, a major component of the late President Yar'Adua's Seven Point Agenda was the development of human capital. Additionally, the administration led by former President Goodluck Ebele Jonathan, late former President Muhamadu Buhari, and current President Ahmed Bola Tinubu did not overlook this objective (Adamu, 2024). As a result, funds have been directed toward the growth of the economy's social service sectors, which include health, education, and other socioeconomic services. Nevertheless, despite this acknowledgement and attempts, there are few studies on human capital development as a catalyst for economic growth in Nigeria, and the relationship between human capital development and economic growth has not yet been thoroughly examined. Thus, this study examined the relationship between Nigeria's economic expansion and the development of human capital.

Statement of the Problem

Effective human resource development, utilization, and management in Nigeria have generally been found to be poor in Nigeria. The rate of illiteracy is extremely high in Nigeria and majority of the labor force is unskilled and uses antiquated resources, machinery, and industrial techniques (Omotor, 2023). Thus, human capital contributions to economic growth have been insignificant and its performance has not increase significantly over the years.

Over the years, government spending on health, education, and other social and community services like eradicating poverty, providing portable water, irrigation, and environmental protection has had minimal effect on economic growth. Because of The Nigerian labour market is weak with a poor rewarding system which has encouraged brain drain. Underemployment and unemployment are the order of the day because thousands of graduates are seen roaming the streets of major cities in the country without concrete employment. Corruption and mismanagement of public funds is rampant as political considerations now outweigh economic considerations in most government decisions.

The 2030 Agenda for Sustainable Development Goals seeks to make Nigeria one of the world's most developed economies by 2030 by enabling its citizens to have the information and skills necessary to tackle the country's vast challenges. However, Nigeria's economic growth has consistently been slowed by the problems of inadequate human development brought on by an unequal distribution of skilled labour, underemployment and unemployment of human capital, and a subpar compensation system. To correct this anomaly, this study was prompted to investigate the nexus between human capital development and economic growth in Nigeria.

Research Hypotheses

The relationship between human capital development and economic growth was tested in this study through the following hypotheses:

- **Hypothesis One:** There is no significant relationship between human capital development and economic growth in Nigeria.
- **Hypothesis Two:** There is no significant relationship between investment in education, health, physical capital formation and other social service expenditures and economic growth in Nigeria.
- **Hypothesis Three:** There is no significant relationship between primary school enrollment, secondary school enrollment and tertiary institutions enrollment on economic growth in Nigeria.

METHODOLOGY

This study aims to present empirical evidence on the impact of human capital development on economic growth, as measured by total government spending on health, education, gross fixed capital formation, other social and community services, and enrollment in primary, secondary, and tertiary education. The Central Bank of Nigeria's (CBN) statistical bulletin, annual report, and statement of accounts were the sources of the information. The Autoregressive Distributed Lag (ARDL) bounds testing method for cointegration was used in the study. The Phillips Perron unit root test and Augmented Dickey Fuller (ADF) are used to ascertain the order of integration. The test for stationarity of the coefficient estimates and serial correlation of the residuals were conducted by using the Cumulative Sum of Squares residuals (CUSUMSQ), the CUSUM of recursive residuals and Durbin-Watson statistic.

This study examined the relationship between Nigeria's output growth, gross fixed capital formation, and human capital expenditures from 1992 to 2024 using the ARDL bounds testing approach to co-integration. One benefit of employing the first difference series is that it aids in removing the impact of the term in the estimable model that does not contain time (Koutsoyannis, 1977). The error correction factor is called ECM_{t-1}. The estimation of a Wald test (F-Stat) is part of the limits testing method. In this study, the Wald test is used to test the null hypothesis that there is no co-integration relationship between human capital formation and gross domestic product variables and other regressors.

Regardless of whether the underlying regressors are I(0), I(1), or mutually co-integrated, the method looks for the presence of a long-term relationship. Under the null hypothesis that there is no relationship between the levels of regressors in the two models, whether they are I(0), I(1), or mutually cointegrated, Pesaran et al. (2001) have demonstrated that the approach is not only consistent, but the derived asymptotic distributions of the Wald test are non-standard. Thus, the limits test process enables the calculation of the Wald or F-statistics, which are then compared with two sets of asymptotic critical values of two polar situations. In one scenario, all regressors are assumed to be I(1), but in the other, they are assumed to be I(0). An inconclusive conclusion is drawn if the calculated Wald or F-statistics are within the critical value bounds.

However, if the calculated Wald or F-statistics are outside the critical value boundaries, a definitive conclusion is reached. For example, the alternative hypothesis of co-integration is true if the calculated F-statistics are greater than the upper boundaries, I(1). It is implied that the chosen variables have a stable long-term relationship. However, if the computed F-statistics falls below the lower bounds, I(0), the null hypothesis of no co-integration cannot be rejected. When the F-statistics are between the upper and lower boundaries, there is a region of inconclusive inference. The order of integration for the explanatory variables must be established before any conclusions can be made. Furthermore, short-run elasticity's are understood to be coefficients

associated with the first differencing variables. Secondary data utilized in the were sourced from the Central Bank of Nigeria's (CBN) Annual Report, Statement of Accounts, and statistical bulletin. The ARDL bounds testing method for co-integration and Ordinary Least Squares (OLS) were used to analyze the data.

The Phillips Perron unit root test and Augmented Dickey Fuller (ADF) are used to establish the order of integration. The Durbin-Watson statistic, the CUSUM of recursive residuals, and the Cumulative Sum of Squares residuals (CUSUMSQ) were used to test for serial correlation of the residuals and stationary of the coefficient estimations. Using two models that explains the various forms of human capital development can be functionally expressed as follows:

$$\text{MODEL 1: } \text{GDP} = f(\text{TEE}, \text{TEH}, \text{GFCF}, \text{SCS}) \quad (3.1)$$

$$\text{MODEL 2: } \text{GDP} = f(\text{PSE}, \text{SSE}, \text{TSE}) \quad (3.2)$$

Where: GDP is Real Gross Domestic Product

TEH = Expenditure on the health sector by the federal government

GFCF = representing Gross fixed capital formation

PSE = Primary School Enrolment

SSE = secondary School Enrolment

TSE = Tertiary institutions Enrolment

TEE = Total government expenditure on education

SCS = Other social and community services expenditure which captures the federal government expenditure on poverty eradication, provision of portable water, irrigation and environmental protection.

A combination of these elements enhances the living standard of people and hence higher productivity. Equations (1) and (2) can be transformed into a log-linear form as:

$$\text{LnGDPt} = \text{bo} + \text{b1LnTEHt} + \text{b2LnSCSt} + \text{b3LnGFCFt} + \alpha_1 \text{LnTEE} + \text{Ut} \quad (3.3)$$

$$\text{LnGDPt} = \text{bo} + \text{b1LnPSEt} + \text{b2LnSSEt} + \text{b3LnTSEt} + \text{Ut} \quad (3.4)$$

Where Ln is the natural logarithm and Ut is a random term that is taken to be orthogonal to any determinants that have a normal distribution and constant variance. According to Tang (2003), the boundaries approach is based on the ARDL model for the co-integration relationship test. Following this lead, the two models as analyzed by this research is re-specified as:

$$\text{DLnGDPt} = \text{bo} + \Sigma \text{b1DLnTEHt-1} + \Sigma \text{b2DLnGDPt-1} + \Sigma \text{b3DLnSCSt-1} + \Sigma \text{b4DLnGFCFt-1} + \Sigma \text{b5DLnTEEt-1} + \text{b6DLnTEHt-1} + \text{b7DLnGDPt-1} + \text{b8DLnSCSt-1} + \text{b9DLnGFCFt-1} + \text{b10DLnTEEt-1} + \Psi \text{ECMt-1} + \text{Ut} \quad (3.5)$$

$$\text{DLnGDPt} = \text{bo} + \Sigma \text{b1DLnPSEt-1} + \Sigma \text{b2DLnSSEt-1} + \Sigma \text{b3DLnTSEt-1} + \Sigma \text{b4DLnGDPt-1} + \text{b5DLnPSEt-1} + \text{b6DLnSSEt-1} + \text{b7DLnTSEt-1} + \text{b8DLnGDPt-1} + \text{b9DLnPSEt-1} + \text{b10DLnSSEt-1} + \Psi \text{ECMt-1} + \text{Ut} \quad (3.6)$$

Where D is the first difference series (i.e. $\text{LnXt} - \text{LnXt-1}$)

RESULTS

The research was conducted using annual data spanning from 1992 to 2024. The federal government's total expenditure on the health sector (TEH), total government expenditure on education (TEE), social and community services expenditure (SCS), which includes federal government spending on eradicating poverty, providing portable water, irrigation, and environmental protection, gross fixed capital formation (GFCF), primary school enrollment (PSE), secondary school enrollment (SSE), and tertiary institutions enrollment (TSE), are the explanatory variables. The dependent variable is GDP. In the models, the fundamental human capital determinants of the economy are represented by federal government spending on health (TEH), education (TEE), PSE, SSE, and TSE. However, health and education contributions are primarily evaluated by spending on schools and medical facilities, respectively, in the traditional measure of economic production (Appleton & Teal, 2018).

To find out which of these factors has a greater influence on production growth, PSE, SSE, and TSE are employed in a different model for comparison. Economic growth is measured by GDP. Variations in PSE, SSE, and TSE are anticipated to have a favorable effect on the level of aggregate output. The Central Bank of Nigeria's (CBN) statistical bulletin, annual report, and statement of accounts were the sources of the data. The study of Hakkio and Rush (2021) provides rationale for the usage of annual data. These authors argue that increasing the numbers of observations (by using monthly and quarterly data) does not add any robustness to the results of cointegration and that seasonal adjustment of quarterly or monthly data in analysis may be biased.

Unit Root Tests

The Phillips Perron (PP) and Augmented Dickey Fuller (ADF) unit root tests are used to establish the order of integration of variables. The unit root test results are shown in Table 1. The explanatory variables (TEE, TEH, GFCF, SCS, PSE, SSE, and TSE) and the statistics for the ADF and PP at output growth levels do not surpass the critical values (in absolute terms). However, both the ADF and PP statistics are found to be larger than their respective critical values (in absolute terms) when taking the initial difference of each variable. The variables are integrated of order one, or I(1), according to the conclusion.

Table 1: Unit Root Test Table (ADF and Phillips Perron)

Variables	At Level	Remark	1st Difference	Remark	Order of Integration
PSE	ADF = 0.046381 10% critical value = -2.6181	Presence of unit root	ADF = -3.539775 10% critical value = -2.6200	Absence of unit root	I(1)
SSE	ADF = -0.182376 10% critical value = -2.6181	Presence of unit root	ADF = -2.803581 10% critical value = -2.6200	Absence of unit root	I(1)
TSE	ADF = -1.122228 10% critical value = -2.6181	Presence of unit root	ADF = -5.656474 10% critical value = -2.6200	Absence of unit root	I(1)
SCS	ADF = 0.083406 10% critical value = -2.6181	Presence of unit root	ADF = -4.413792 10% critical value = -2.6200	Absence of unit root	I(1)

TEE	ADF = 0.060089 10% critical value = -2.6181	Presence of unit root	ADF = -4.609811 10% critical value = -2.6200	Absence of unit root	I(1)
THE	ADF = -2.032746 10% critical value = -2.6181	Presence of unit root	ADF = -4.549777 10% critical value = -2.6200	Absence of unit root	I(1)
GFCF	ADF = 0.276648 10% critical value = -2.6181	Presence of unit root	ADF = -4.758261 10% critical value = -2.6200	Absence of unit root	I(1)
GDP	ADF = -0.559341 10% critical value = -2.6168	Presence of unit root	ADF = -3.619930 10% critical value = -2.6200	Absence of unit root	I(1)

Table 2: ARDL Bounds Test for Co-integration Analysis

Critical value (F Statistic) for the bounds test: Unrestricted intercept and no trend

Computed F – Statistic	5% Critical Values	
	Lower Bounds	Upper Bounds
8.2301	2.8	4.01

At the 5% significance level for production growth, the null hypothesis of no co-integration can be rejected based on the calculated F-statistic. The computed F-statistics, $F_{stat} = 8.2301$, is greater than the upper bound critical value of 4.01. The human capital variables (i.e., the explanatory variables) and the coefficients of the error correction variable (ECM), which is represented as RESID01 in the parsimonious model, are the primary findings of interest. The error correction variable (ECM) indicates the rate of change from short-run to long-run equilibrium, whereas the coefficients of the variables are understood as short-run elasticity's.

DISCUSSION

The coefficient of the Error Correction Mechanism, ECM (-1) of -0.515116 suggests an average convergence to equilibrium. The existence of co-integration is thus confirmed by the long-term equilibrium between the independent and dependent variables. According to the coefficient in the error correction term, the present period's output growth disequilibrium will be adjusted by 51.51 percent in the subsequent period. This finding is in conformity with Awaritefe (2018) who discovered a positive significant relationship between human capital development and economic development.

According to the regression results, Nigeria's human capital development is growing relatively slowly. The findings also demonstrate that the explanatory variables, that is, total spending on health and education, gross fixed capital formation, social and community services, primary, secondary, and tertiary institutions enrollment, and gross fixed capital formation are factors that influence the development of human capital in Nigeria. This finding is in tandem with the findings of Adamu (2023) who discovered a poor state of human capital development in Nigeria

The Total Expenditure on Education (TEE) coefficient, 0.283921, is significant at 10% and indicates a positive correlation with production growth. This suggests that a 28.39 percent increase in output will result from a 1 percent increase in education spending throughout the

current timeframe. This finding corroborated the findings of Gbosi (2016) who discovered a positive correlation between government expenditure on education and economic growth.

The Total Expenditure on Health (TEH) coefficient, 0.461316, is significant at 10% and indicates a positive association with production growth. This suggests that after a one-period lag, a 1% increase in health spending will result in a 46.13% rise in output. At 10%, the Gross Fixed Capital Formation (GFCF) coefficient of 0.449361 is significant and exhibits a positive correlation with production growth. This implies that a 1 percent increase in gross fixed capital formation will cause a 44.936 percent increase in output after a two period lag. This result is in agreement with the findings of Nwadiani (2018) who discovered a significant positive correlation between government expenditure on health and economic development.

Social and Community Services (SCS), with a value of 0.124655, had the least favorable impact on economic growth. This suggests that a one-period lag will result in a 12.4655 percent rise in productivity for every 1 percent increase in social and community services. This finding is in conformity with the findings of Nafziger (2020) who discovered a non-significant correlation between social and community services and economic correlation

Primary school enrollment (PSE), with a correlation of 0.709972, favorably impacted economic growth. This suggests that after a two-lag period, a 1% increase in primary school enrollment will result in a 70.99% rise in economic growth. This finding is in tandem with findings of Pritcnett (2016) who discovered a positive significant impact of primary school enrollment on economic growth.

Additionally, secondary school enrollment (SSE), with a coefficient of 0.844961, positively impacted economic growth. This suggests that economic growth will rise by 84.4961 percent for every 1% increase in secondary school enrollment. This finding is in consonance with the findings of Adeyemi and Akpotu (2024) who discovered a positive significant correlation between secondary school and economic development.

A positive coefficient of 0.388457 was found for tertiary institutions enrollment (TSE). This implies that a 1 percent increase in tertiary institutions enrolment will cause a 38.8457 percent increase in economic growth. This finding is in agreement with Azariadis and Drazen (2020) who discovered who discovered a positive correlation between tertiary institutions graduation rate and economic growth in Nigeria.

CONCLUSION

The estimation results reveal that there is a positive association between total educational expenditure, gross fixed capital creation, social and community services, and output growth. However, there is a negative link between total health expenditure, primary school enrolment, secondary school enrolment, tertiary institutions enrollment, and output growth. Overall, the findings indicate that human capital has a minor role in Nigeria's economic growth. This could be related to the high rates of underemployment and unemployment, particularly among the educated labor force.

Furthermore, inefficient use of human capital buildup lowers aggregate income, lowering consumption levels of locally produced products and services. This leads to delayed economic growth. Due to their very low level of competitiveness, Nigerian indigenous industries' output aside from oil is primarily traded on domestic markets. Furthermore, given the state of the labor market, which promotes brain drain, the effectiveness and quality of Nigeria's human capital raise questions about its contribution to economic growth.

Additionally, politicians and government officials occasionally increase spending and investment in unproductive projects or in goods that the private sector can produce more efficiently due to corruption and in an attempt to gain cheap popularity and maintain their position of power. Therefore, government actions might occasionally result in resource misallocation and hinder the expansion of national productivity.

Unfortunately, rising government expenditure has not yet translated to meaningful growth and development, as Nigeria ranks among the poorest countries in the world. Furthermore, nearly 50% of Nigerians live on less than \$2 per day, and many have continued to live in abject poverty. Alongside this are deteriorating infrastructures, particularly the power supply and roads, which have caused numerous industries to fail, including a high unemployment rate. Furthermore, Nigeria has not performed well over the course of this study, according to macroeconomic variables such as the balance of payments, import obligations, inflation rates, exchange rates, and national savings.

Recommendations

Based on the findings of the study, the following recommendations were proffered:

- The government and the corporate sector must make a deliberate effort to increase labor-intensive growth and allocate funds for health and education in order to enhance human capital. Government spending on health and education is therefore especially crucial as these expenditures have indirect advantages that people might not consider when making financial decisions. Even if financing for health and education has improved somewhat, given their complementarities, this has not kept pace with the increase in physical capital.
- In order to keep up with the evolution of machines, adequate skills are required. Indeed, investing in both machines and people at the same time is vital, and the amount of funds allocated to other forms of capital should be dynamic.
- The admissions process should be adjusted in favor of core sciences and technical courses, with enough school finance.
- The government should redesign higher education curricula to make them more practical, especially in technical and engineering programs. Practical abilities for solving everyday problems should be highlighted. On-the-job training deserves specific attention.
- The government should strengthen its collaboration with the private sector to support investment in the economy, which will boost employment and physical capital production.
- Good governance can only survive in a corrupt-free environment; therefore, the government, private enterprises, and other corporate organizations, as well as the general public, must work together to decrease, if not entirely eliminate, corruption.
- School intake, particularly in the university system, should be of high quality. This will ensure that the graduates are employable.

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