

Basic Education as Engine of Economic Growth: A Critical Evaluation

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Abstract: The paper analyzes the nexus between education and economic growth. Using a time series analysis from 1990 to 2024, Dynamic Ordinary Least Squares (DOLS) was employed to analyse the co-integration relationship among the variables. The findings reveal a negative correlation between basic education and economic growth. This implies low learning outcomes, an outdated curriculum, and poor teachers quality. It was recommended that there should be investment in teachers' training, modern learning materials, and the development of an effective monitoring system to improve learning outcomes. This can turn basic education into a positive engine for economic growth. The Gini coefficient showed a positive but insignificant relationship with growth. It implies that inequality is rising in Nigeria. To turn this tide, programs such as scholarships for disadvantaged groups, school feeding programs, and conditional cash transfers can be initiated and adopted. These support the poor and prevent inequality from worsening as the economy grows.

Keywords: Economic Growth, Basic Education, Inequality, Gini-Coefficient, Dynamic Ordinary Least Squares (DOLS).

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I. INTRODUCTION

Economic literature unanimously agrees that education and economic growth are complementary. Basic education is a fundamental or formal education given to every child. UNESCO (2025) sees basic education as a public good and a universal right of every child. Such basic education, according to UNESCO, must meet basic learning needs and form the building block for lifelong learning and human development. It included emphasis on the '3Rs', reading, writing, and arithmetic; acquisition of cognitive skills and development of mental, emotional, and social well-being; universal access and compulsory nature; equity and inclusion for all learners, including the marginalised groups. In line with the above, basic education is the fundamental foundation for human capital formation; it equips citizens with basic problem-solving skills, numeracy, and literacy, which increases labour productivity and economic growth. Research shows a strong positive correlation between education and economic development. (Ramcharan, 2024; Sebki, 2021; Barro, 2021; Okeowo, 2020)). Barro found that an additional year of schooling can raise a country's average GDP growth rate by 0.37%, pointing to the importance of education in the economic growth process.

Hanushek and Woessmann (2012) query whether improvement in quality education using cognitive skills as a parameter of measurement, rather than using year of schooling, is a major driver of economic growth. Using

panel data, involving instrumental variables and growth regression, the paper found that cognitive skills contribute directly to labour productivity and economic growth when compared to the number of years of schooling. The result also shows that a one standard deviation increase in test score is associated with a 2% increase in annual GDP per capita growth. The study demonstrated that expanding access to education is good, but improving the quality of education through curriculum reform that is in line with current economic realities, equipping teachers and instructors through training and retraining, is better. This study concludes that investment in education should be directed towards learning outcomes, not just enrollment numbers. The paper made an empirical investigation into the education and economic growth nexus. It tends to give an empirical explanation for why education leads to economic growth in some countries and why it retard growth in others. The study's theoretical suggestion shows that the weak and insignificant link between education and economic growth is due to measurement error or data limitation. The study's empirical findings using panel regression show that there exists a strong positive relationship between education and economic growth, especially in developing countries. The study also supports using quality education as the main parameter of measuring the value of education, rather than school enrolment and year of schooling. Similarly, the return on education is not the same across countries and across income levels, as developing countries have a higher return

on investment in education when compared to the developed ones

UNESCO (2020) social benefit and cost analysis of the impact of education expenditure on economic growth, shows that every dollar invested in education yielded a return of about fifteen dollars in economic goods. Although there is a need for further research to ascertain this claim by UNESCO in specific countries, adoption and investment-return claims. However, the assertion shows the sector's high social return on investment.

This study evaluated the education and economic growth Nexus. Its objective is to analyse the specific numerical impact of basic education as defined by UNESCO on the economic growth of Nigeria. It will also analyze the theoretical underpinning, empirical evidence, and contextual analysis that forged these linkages while also suggesting policy instruments to maximise the potential of the education sector.

II. THEORETICAL LITERATURE

The study is anchored on human capital theory developed by Schultz (1961) and further developed by Becker (1964). The theory posits that investing in people through education and skill acquisition increases economic growth just the same way as investing in physical capital like machines and factories. The study viewed investment in education as a form of national capital accumulation. The theory proposes that education increases workers' productivity, enhances innovation, adaptability, and creativity, leads to higher income earning, and consequently leads to economic growth and development.

The neoclassical growth theory by Solow 1956 proposes that labour growth, capital accumulation, and exogenous technological progress are drivers of long-run economic growth. The model views education as part of human capital, which consequently improves the productivity of labour, which is the main component of Solow's model. However, in its natural state, Solow's model assumes a diminishing return to capital and labour, implying that increasing this input alone cannot sustain long-term economic growth, pointing to the fact that an exogenous technical factor is necessary for sustained growth. On the other hand, the endogenous growth theory was developed as a reaction to some deficiencies and critical omissions in the neoclassical growth model. The endogenous growth theory explains the long-run growth rate of an economy using endogenous factors as an impact against the exogenous factor of the neoclassical growth theory. The model emphasises technical progress resulting from the rate of investment, the size of the capital stock, and the stock of human capital. Three main theories emanate from the endogenous model. The first is the Arrow theory and other models. Arrow introduces the idea of learning by doing, by regarding it as endogenous in the growth process. Arrow maintains that new capital goods incorporate all the knowledge available at a given time in the production process, but once built, the productive deficiencies cannot

be changed by subsequent learning. Arrow's production function is written as $Y_i = A k_i^\alpha L_i^{1-\alpha}$, where L_i denotes the stock of Labour, K_i is the stock of capital, and Y_i is the output of firm i , A is the technology factor, and K denotes the aggregate stock of capital. Within this theory is the Levhari-Sheshinski theory that emphasises the spillover effects of increased knowledge as the main source of knowledge. It is assumed that the source of knowledge or learning by doing is each firm's investment. It means that an increase in a firm's investment leads to a corresponding increase in its level of knowledge, with the assumption that the knowledge of a firm is a public good that other firms can have at zero cost. It implies that knowledge has a non-rival characteristics which spill over across all the firms in the economy. The assumption in the theory holds that each firm operates under constant returns to scale, and the economy as a whole is operating under increasing returns to scale.

In Levhari-Sheshinski's theory, learning by doing is endogenous, demonstrating an upward-sloping production function, and economic growth is explained in terms of aggregate increasing returns, consistent with competitive equilibrium. The King Robinson theory, learning by watching, was emphasised in the production function. Investment by a firm represents an innovation in a particular direction to solve problems faced by the firm. If such an adventure is successful, the other firm will tend to adopt and adapt the innovation to solve its particular needs. Therefore, externalities resulting from learning by watching are a key to economic growth.

The Lucas theory emphasises that investment in education leads to the production of human capital, which is the crucial determinant in the growth process. Lucas made a distinction between the internal and external effects of human capital. In internal effect, the individual worker undergoing training becomes more productive, while the external effects consist of the spillover and increase in the productivity of capital of other workers in the economy. Thus, it is investment in human capital rather than physical capital that has spillover effects that increase the level of technology. Lucas' production function is given as $Y_i = A(K_i)(H_i)H_e$. K_i and H_i are the inputs of physical and human capital used by firms to produce goods Y_i . 'A' is the technical coefficient, and H is the economy's average level of human capital. 'e' represents the strength of the external effect from human capital to each firm's productivity. In Lucas' theory, while there are increasing returns to scale for the whole economy, each firm faces constant returns to scale. Learning by doing is regarded as on-the-job training, and the spillover effect involves human capital. Each firm benefits from the average level of human capital in the economy, rather than from the aggregate of human capital. It is the average level of skills and knowledge in the economy that is crucial for economic growth, rather than the accumulated knowledge or experience of other firms. Technology is endogenous, provided as a side effect of investment decisions by firms. From the point of view of the users, technology is treated as a public good; hence, firms can be treated as price takers, and there can be an equilibrium with many firms as under perfect competition.

Romer's theory of endogenous technical change of 1990 identifies research and development R&D specializing in the production of ideas. New knowledge or production of ideas is a result of the development of human capital along with the existing stock of knowledge. To Romer, natural resources are good, but ideas are more important and better than possession of natural resources.

III. EMPIRICAL LITERATURE

Obradovic (2015) analyzes the relationship between education and economic growth using content analysis. Emphasis was laid on human capital development for achieving sustainable economic growth in developing countries. According to Obradovic, the quality and quantity of primary education cannot be overemphasized. Additionally, the issue of increasing the quality and quantity of secondary education was also discussed at length in the paper. The research opined that higher wages cannot be justified if they are not accompanied by a higher level of productivity; thus, the role of education in modern knowledge and technology is crucial to increase productivity. The paper concludes that the whole essence of education is to create, improve, and develop capabilities for innovation to provide effective support for nation-building. Similarly, education at any level that is not devoid of innovative problem solving, including creative thinking, according to Obradovic, has the tendency to face a greater risk of low wages and unemployment.

Ramcharan (2004) explains the linkages between education and economic growth, using cross-country panel data, comprising both developing and developed countries. The paper analyzes the importance of education at different levels, including primary, secondary, and tertiary education. The study findings queried the importance and impact of basic education on economic growth. The literature has consistently supported the promotion of basic education to sustain growth. Ramcharan maintains that basic education alone will not lead to sustained economic growth. To achieve sustained economic growth and development, Ramcharan emphasised more investment in tertiary education. A distinction was made between developed and developing nations. For developing nations, basic education can have a greater impact on economic growth, but for middle and high-income countries, the findings show that it has a lower impact, implying that tertiary education has a greater impact on economic growth and development.

Sebki's (2021) empirical result also supports Ramcharan's findings. Using Generalised Method of Moments (GMM) estimator, the paper uses enrolment ratio in secondary and higher education data to analyse the impact of education and economic growth. Forty developing countries were used as sample data for the period of 2002 to 2016. The findings revealed that secondary education enrollment has negative effects on economic growth, while tertiary education enrollment had a significant positive effect. The debate on whether the primary basic education or the tertiary education has an impact on economic growth was extended by Baya et al. (2004). The study by Baya et al basically examines the interaction between education and economic growth using sixty-two selected countries within the period of 1990 to 2020. Arellance and Bond's (1991) methodology was used to analyse the data. The results showed that education plays a vital role in a country's development process. More importantly, the study found that primary education, out of the three (primary, secondary, and tertiary) used in the sample data, significantly influenced a country's economic growth. Senadza and Hodey (2022) explained the importance of human capital development (HCD) to economic growth. This study sees education as one of the most important components of HCD; hence, government expenditure on education determines the rate of a country's HCD and consequently the rate of economic growth. Using Generalised Method of Moments (GMM) for sixteen Sub-Saharan African (SSA) countries, the paper found a non-monotonic U-shaped interaction between government expenditure on education and economic growth. The study found that the education expenditure as a share of total government expenditure stood at 20.5% with the result pointing to a positive lag effect of public expenditure on education and economic growth.

IV. METHODOLOGY

The paper uses time series analysis from 1990 to 2024. Dynamic Ordinary Least Squares (DOLS) was specifically employed to analyse the co-integration relationship among the variables. Co-integration techniques can be adopted depending on the data properties of the variables (Okeowo, 2023; Okeowo & Awotade, 2024; Okeowo, 2023; Okeowo & Ozekhome, 2020; Ozekhome & Okeowo, 2023; Okeowo et al., 2025).

The operational form of the model is specified as:

$$GDP_t = \beta_0 + \beta_1 GINI_t + \beta_2 FPE_t + \beta_3 PEE_t + \sum_{i=1}^n \beta_i GINI_{t-i} + \sum_{j=1}^n \beta_j FPE_{t-i} + \sum_{l=1}^n \beta_l PEE_{t-i} + et$$

GDP_t : Gross Domestic Product

$GINI_t$: Gini-coefficient

FPE_t : Female Primary Enrolment

PEE_t : Primary education enrolment

Et is error term and β_1, β_2 and β_3 are long run coefficient

When estimating long-run relationships among cointegrated series, DOLS helps to address simultaneity bias and endogeneity commonly experienced in macroeconomic time series data. Hence, when DOLS produce a cointegrating regression, the estimates are consistent, unbiased, and asymptotically efficient even in small samples.

V. PRESENTATION AND ANALYSES OF RESULTS

2023; Okeowo, 2024; Okeowo, 2019; Aladejano et al., 2021; Okeowo et al., 2024; Falade et al., 2021; Ozekhome et al., 2024; Ozekhome et al., 2023; Ozekhome et al., 2022).

➤ *Unit Root Tests for the Variables*

The time series data is subjected to unit root test as observed in most literature (Okeowo, 2020; Okeowo et al,

Table 1 Unit Root Tests- 1990 to 2024 Series

Variables	ADF Test Stat. Level	Conclusion	ADF Test Stat. 1st Diff.	conclusion
GDP	2.939805 (-2.981038)	Non-stationary	-1.484929 (-2.986225)	Non- stationary
GINI	-0.977920 (-2.951125)	Non-stationary	-5.647170 (-2.954021)	Stationary
FPE	-1.384355 (-2.951125)	Non-stationary	-5.160772 (-2.954021)	Stationary
PEE	0.478759 (-2.963972)	Non-stationary	-6.037351 (-2.963972)	stationary

➤ *Result Extracted from E-Views Output*

Using the Augmented Dickey-Fuller (ADF) for the unit root tests, the calculated values of these statistics tests are

compared with their critical values. The result shows that the entire variables are non-stationary at level but stationary at first difference except the GDP (table 1).

Table 2 Hansen Test of Co-Integration Result

Lc statistic	Stochastic Trends (m)	Deterministic Trends (k)	Excluded Trends (p2)	Prob.*
0.113621	3	0	0	> 0.2

➤ *Result Extracted from E-Views Output*

With Lc Sttistics of 0.113621, stochastic trend of 3 and Prob* of (> 0.2), it shows that the series are cointegrated,

that is, a stable long run relationship exists among the variables used in the model (table 2).

Table 3 Dynamic Ordinary Least Squares (DOLS) Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GINI	5.99E+08	1.87E+09	0.320211	0.7523
FPE	2.35E+10	7.38E+09	3.190770	0.0048
PEE	-5437.979	2238.706	-2.429073	0.0252

➤ *Result Extracted from E-Views Output*

The results indicate that there is a negative and significant relationship between economic growth and primary education in Nigeria. 5437.9 units change in primary education bring about a unit change in economic growth. Okeowo 20,, argue that the emphasis should not only be on the quantity of education, in terms of school enrollment, but also in terms of quality of education. The literature unanimously agrees that education increases economic growth. A situation where education retard growth shows poor education, an unproductive product of such educational process, and a need to revisit the structure of the Nigerian educational system. The result also showed a positive and significant relationship between Female Primary Enrollment (FPE) and economic growth. A (2.35E+10) change in FPE brings about a unit change in economic growth. Similarly, the results also indicate a positive but insignificant relationship between economic growth and the Gini coefficient. Ordinarily, what does this result signify? It shows that economic growth is not inclusive and such growth increases the concentration of income, which indirectly retard the quality of education. It also signifies high income inequality, with the poor treating

education not as a primary need but as a secondary need, due to insufficient funds.

VI. CONCLUSION AND RECOMMENDATION

The result indicates a negative relationship between basic education and growth, which implies low learning outcomes, outdated curriculum, and poor teacher quality. It is recommended that there should be investment in teachers' training, modern learning materials, and the development of an effective monitoring system to improve learning outcomes. This can turn basic education into a positive engine for economic growth. The Gini coefficient shows a positive but insignificant relationship with growth. It implies that inequality is rising in Nigeria. To turn this tide, programs, such as scholarships for disadvantaged groups, school feeding programs, and conditional cash transfers, can be initiated and adopted. These support the poor and prevent inequality from worsening as the economy grows. The findings show a positive and significant relationship between female primary school enrollment and economic growth; there should be an increase in girls' primary education. The government should make it easier for more girls to attend schools, especially in underserved rural areas,

by expanding school infrastructure, providing more classrooms, and ensuring adequate teaching staff. Many girls drop out due to poverty. Policies that reduce or remove the cost burden can increase enrollment, and the government should integrate gender-response policies into national education planning.

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