Human Capital Development and Economic Growth in Nigeria

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Abstract
This study examined the effect of human capital development, on economic growth in Nigeria from 1981-2021. The data used in this study were obtained from Central Bank of Nigeria Statistical Bulletin of various issues (2021) and WDI (2022). These comprises of annual data of the following variables Gross Domestic Product Growth Rate serves as the dependent variables in the model while Government Expenditure on Education, Government Expenditure on Health, Gross Fixed Capital Formation and Labour Participation Rate serves as the independent variables. The test statistics used in the analysis was; Auto Regressive Distributed Lag (ARDL). The results showed that; Government Expenditure on Education, Government Expenditure on Health, and Labour Participation Rate have a negative insignificant relationship with economic growth in Nigeria while Gross Fixed Capital Formation have negative and significant relationship with economic growth. It was recommended that; the need for government to prioritize investment in education becomes imminent, that is if investment in education is judiciously adhered to, in the long run it will improve economic growth and development in the country; and government should as a matter of urgency increase investment in the health sector because its multiplier effects in the long run cannot be over emphasized

Keywords: Human Capital Development, Government Expenditure on Education, Government Expenditure on Health, Gross Fixed Capital Formation, Labour Participation Rate, Economic Growth

I.   Introduction

Education and health are the basic objectives of development; they are important ends in themselves. Health is central to well-being, and education is essential for satisfying and rewarding life: both are fundamental to the broader notion of expanded human capabilities that lie at the heart of the meaning of development (Todaro and Smith, 2009).The Nigerian economy could be said to have enjoyed some macroeconomic stability in the recent time as its rate of economic growth averaged 2.01 percent within the last two decades. However, as a result of high and rapid growth rate of the population, per capita growth rate has remained negative and it averaged -0.852. According to World Development Indicator, (2004) with its large reserves of human and natural resources, Nigeria has the potential to build a prosperous economy, reduce poverty significantly, and provide health care services, education, and infrastructure services that its population needs. Nevertheless, despite the country's relative oil wealth, poverty is widespread (oil revenue is only about .50c per capita), and Nigeria's basic social indicators place it among the twenty poorest countries in the world. (World Bank, 2004) poverty, which has no geographical boundary, is seen in all part of the country, rural and urban areas inclusive. Although the incidence of poverty is much higher in the rural areas than in the urban areas. The poor are those who are unable to obtain an adequate income, find a stable job, own property or maintain healthy living conditions. They also lack adequate level of education and cannot satisfy their basic health needs. As such the poor are often illiterate, in poor health and have a short life span. Education and Health are widely accepted as leading

instruments for promoting economic growth of any Nation. In Nigeria, where growth is essential to the country to climb out of poverty, education and health are particularly important. For several decades, development agencies have placed great emphasis on primary and, more recently, secondary education. But they have neglected tertiary education as a means to improve economic growth and mitigate poverty. The Dakar summit on "Education for All" in 2000, for example, advocated only for primary education as a driver of broad social welfare. It left tertiary education in background. Part of the reason for the inattention to higher education within development initiatives lays the shortage of empirical evidence that it affects economic growth and poverty reduction. After World War II, Friedman (1993) originally suggested that there was no evidence that higher education yields social benefits over and above the benefits that accrue to the students themselves. On the contrary, they hypothesized that higher education may promote social unrest and political instability. In contrast to this early view, recent evidence suggests higher education is a determinant as well as a result of income, and can produce public and private benefits. Higher education may create greater tax revenue, increase savings and investment, and lead to a more entrepreneurial and civic society. It can also improve a nation's health, contribute to reduced population growth, improve technology, and strengthen governance. With regard to the benefit of higher education for country's economy, many observers attribute India's leap onto the world economic stage as stemming from its decades-long successful efforts to provide high-quality, technically oriented tertiary education to a significant number of its citizens.

Despite the tremendous progress in expanding enrolment and increasing years of schooling since 1960, Nigeria is yet to benefit from such development in-term of increased growth. Schooling in Nigeria has not delivered fully on its promise as the driver of economic success. Expanding school attainment, at the centre of most development strategies, has not guaranteed better economic conditions (Fadiya, 2010). Scholars attributed the failure of the Nigeria's educational system to promote economic growth on the poor state of the system (Babatunde and Adefabi 2005). According to Babatunde and Adefabi (2005), the education that most Nigerians receive is not very good. Children attend primary schools which last for six years, but the education they receive there is not sufficient. The pupils to teachers ratio there was 37

to 1 and the youth literacy rate was 13% for males and 20% for females up to the late 1990s. In 2002, 33% of the relevant age group attended secondary school and only 4% attended tertiary schools. The low number of students in tertiary school can be easily explained in that spending per student in tertiary schools is 529.8% of the GNP. Furthermore, public spending on education was only 0.9% of the GNP in 2002 (World Bank, 2004).

Health comes next to education in the development of human resources. According to Yesufu (2000), a good health policy is a means by which government can at once ensure that manpower is generated in the right mix distributed in accordance with national priorities and ensure the highest level of labour productivity. Health improvement influences morbidity and labour force productivity, thereby enhancing the process and speeding of economic development. Most developing countries have given serious attention to the provision of public health, education and social welfare services. This is because; it is believed that such measures could improve the quality of life of their people and their efficiency as productive agents thereby accelerating the general socio-economic development of their nation. Since health and education status affects the individual participation in economic activities and consequently the level of labour force in an economy, a re-examination of the level of investment in human capital and sustainable growth is highly imperative. The investment on health and education sectors according to literature should therefore improve the productivity of an economy.

Statement of the Problem
The financing of human capital investment in Nigeria has often been described as inadequate with budgetary allocations to these sectors (especially health and education) hardly exceeding, on average 4% of the nation's total budgetary provisions (Orubuloye and Oni, 1996; Riman and Apkan, 2012). For instance, the education and health care spending in Nigeria is segmented into private and public spending. While public health expenditures in Nigeria account for just 20-30% of total health expenditures, private expenditures on health account for 70-80% of total health expenditure. It is expected that budgetary allocations to health sector would improve health outcome and reduce all kinds of mortality rate. Below are the trends in human capital development component (government expenditure on education and health) and economic growth;
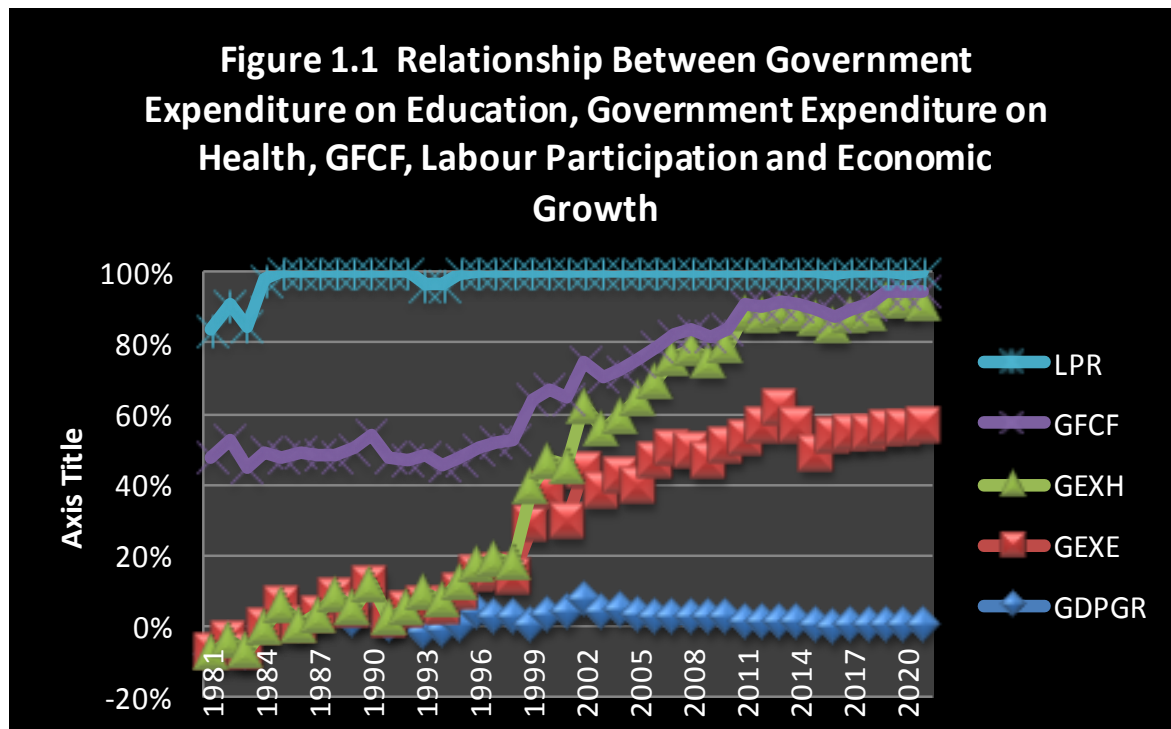
Source: Central Bank of Nigeria Statistical Bulletin of various issues (2021) and WDI (2022)

According to CBN, (2021) the above figure, shows the relationship between economic growth and government expenditure on education and health in 1981, 1986, 2001, 2006, 2011, 2016, 2021 are (0.17, 0.08), (0.26, 0.13), (39.88, 24.52), (119.02, 62.25), (335.80, 231.80), (339.28, 200.82) and (620.59, 386.24) respectively. The GDP growth rate have been fluctuating over time too; the trend is highlighted on the above figure which started from 1981 as -13.13, (1986 = 0.06), (2001 = 5.92), (2006 = 6.06) (2011 = 5.31), (2016 = -1.62) and (2021 = 3.4). Given this level of government spending, it will be very difficult to provide the essential health care services, and with the unpredictable change of the oil prices in the world market and low tax base, health care will always be at the peril of underfunding by the Nigerian government. Low level of life expectancy is explained by inadequate finances meant for health sector in Nigeria. This is blamed on uneven distribution of finance and facilities, especially in the primary health care. The allocation to education sector is not different from that of health. It is pertinent to note also that the budgetary allocation to the education sector have reduced drastically over years. Accordingly, there is the need to examine the level of human capital development and its impact on economic growth in Nigeria.

Objective of the study
The broad objective of this study is to examine the impact of human capital development on economic growth in Nigeria. However, the specific objectives are:
1. To determine the relationship between government expenditure on education and economic growth in Nigeria
2. To investigate the relationship between government expenditure on health and economic growth in Nigeria
3. To analyze the relationship between gross fixed capita formation and economic growth in Nigeria
4. To examine the relationship between labour participation and economic growth in Nigeria

Conceptual Literature
Human Capital
Human capital has been recognized globally as one major factor that is responsible for the wealth of a Nations According to Smith (1776), he underlined the importance of "the acquired and useful abilities of all the inhabitants or members of the society" in he's works. Romele (2013) defined Human capital as the totality of knowledge and skills which have been accumulated during life, through education, training, and work experience and which influence labour productivity. Adeyemi and Ogunsola (2016) described human capital as an

important factor used in converting all resources to benefit mankind. In another dimension. Human capital is represented by the aggregation of investment in activities, such as education, health, on-the-job training and migration that enhance an individual's productivity in the labour market. Frank &Bemanke (2007) defines that human capital is 'an amalgam of factors such as education, experience, training, intelligence, energy, work habits, trustworthiness, and initiative that affect the value of a worker's marginal product'. Therefore, human capital refers to the process of acquiring and increasing the number of people who have the skills, good health, education and experience that are critical for economic development.

Human Capital Development

Aluko (2015) defined Human capital development to mean enhances the skills, knowledge, productivity and inventiveness of people through a process of human capital formation broadly conceived. Thus, human capital development is a people centered strategy, and not goods centered or production centered strategy of development. In the works of Torruam and Abur (2014) Human capital development can be seen to mean developing skills, knowledge, productivity and inventiveness of people through process of human capital formation. It is a people centered strategy of development which is recognized as an agent of national development in all countries of the world. Human capital formation refers to the process of acquiring and increasing the number of people who have the skills, good health, education and experience that are critical for economic development. Human capital development refers to the process of acquiring and increasing the number of persons who have the skill, education, experience which are critical for the economic and political development of a country. Human capital development is thus associated with investment in man and his development as a creative and productive resource (Jhingan 2013). Schultz (1960) in Jhingan (2013) categorized and developed human resources into six ways: (i) Heath facilities and services: - this involves all expenditure that affects the life expectancy, strength and stamina, and vigor and vitality of the people, (ii) On – the job training which includes old type apprenticeship organized by firms, (iii) Formally organized education at elementary, secondary school and higher level, (iv) Study programmes for adults that are not in agriculture, (v) It involves migration of individual and families to adjust changing job opportunity (factor mobility), (vi) Finally, transfer or

importation of technical assistance, expertise and consultants. The working definition for this research will be in line with Eggoh et al, (2015), Torruam and Abur (2014) and Romele (2013) that Human capital development is therefore the process of acquiring Knowledge, increasing good health, training to increase capability and creativity in other to develop the ability of the labour force which will reflect on the productive of an economy. Hence Human capital development is generally viewed from the expenditure on education, expenditure on health, and school enrollment. (Hanif and Arshed 2016)

Economic Growth

Tadaro (2007) defined the term economic growth as a process by which the productive capacity of the economy is increased over time to bring about raising level of national output and income. Kuznets (1966) on the other hand views economic growth as a long term process wherein the substantial and sustained rise in real national income, total population and real per capita income takes place. Kindlerberge (1965) see economic growth to mean more output derived from greater efficiency. Friedman (1972) however views economic growth as an expansion of the system in one or more dimensions out a change in its structure. Thus economic growth is related to a quantitative sustained increase in the countries per capita output or income accompanied by expansion in its labour force, consumption, capital and volume of trade Jhingan (2013). From the above definitions its essential to understand that economic growth basically entails a long run process involving a period of time, increase in real per capital income level and volume of production linked with large increase in the productive ability of the economy, urbanization, equitable distribution of income and wealth among the population which result in reduction poverty and unemployment in a country.

Theoretical Literature Review
Theories on Human Capital

Human Capital theory as postulated by Paul Romer (1986) emphasizes how education increases the productivity and efficiency of workers by increasing the level of their cognitive skills. Schultz (1961), introduced the notion that people invest in education increase their stock of human capital. Examples of such investments include expenditure on education, on the job training, health and nutrition. Such expenditures increase future productive capacity at the expense of current consumption. However, the stock of human capital

increases in a period only when gross investment exceeds depreciation with a passage of time, with intense use or lack of use. The provision of education is seen as a productive investment in human being, an investment which the proponents of human capital theory considers to be equally or even more equally worthwhile than that is physical capital.

In fact, contemporary knowledge in United States acknowledges that investment in human capital is three times better than that in physical capital. Human capital theorists have established that basic literacy enhances the productivity of workers in low-skill occupations. They further state that an instruction that demands logical or analytical reasoning, or provides technical and specialized knowledge, increases the marginal productivity of workers in high-skill or professional positions. It has been proven that the greater the provisions of schooling the greater the stocks of human capital in the society, consequently, the greater the increase in national productivity and economic growth.

Quantitative Theory of Human Capital Investment

Erosa et al (2010) developed a quantitative theory of human capital investment in order to evaluate the magnitude of cross-country differences in total factor productivity (TFP) that explains the variation in per-capita incomes across countries. They built a heterogeneous-agent economy with cross-sectional variation in ability, schooling, and expenditures on schooling quality. In their theory, the parameters governing human capital production and random ability process have important implications for a set of cross-sectional statistics − Mincer return, variance of earnings, variance of schooling, and intergenerational correlation of earnings. These restrictions of the theory and U.S. household data were used to pin down the key parameters driving the quantitative implications of the theory. They found that human capital accumulation strongly amplifies total factor productivity (TFP) differences across countries. In particular, an elasticity of output per worker with respect to TFP of 2.8: a 3-fold difference in TFP explains a 20-fold difference in output per worker. They argued that the cross-country differences in human capital implied by the theory are consistent with a wide array of evidence including earnings of immigrants in the United States, average mincer returns across countries, and the relationship between average years of schooling and per-capita income across countries. The theory implies that using Mincer returns to measure human capital

understates differences across countries by a factor of 2.

The Modernization Theory

This theory focuses on how education transforms an individual's value, belief and behaviour. Exposure to modernization institutions such as schools, factories, and mass media inculcate modern values and attitudes. The attitude include openness to new idea, independences from traditional authorities, willingness to plan and calculate further exigencies and growing sense of personal and social efficacy. According to the modernization theorists, these normative and attitudinal changes continue throughout the life cycle, permanently altering the individual's relationship with the social structure. The greater the number of people exposed to modernization institutions, the greater the level of individual modernity attained by the society. Once a critical segment of a population changes in this way, the pace of society's modernization and economic development quickens. Thus, educational expansion through its effects on individual values and benefits sets in motion the necessary building blocks for a more productive workforce and a more sustained economic growth.

The dependence theory

This theory arose from Marxist conceptualizations based on the dynamic world system that structures conditions for economic transformation in both the core and periphery of the world economy. Certain features of the world polity such as state fiscal strength, degrees and regime centralization and external political integration may contribute to economic growth in the developing world.

Theoretical underpinnings on economic growth
Harrod-Domar Growth Model-

Every economy must save a certain proportion of its national income, if only to replace worn-out or impaired capital goods (buildings, equipment, and materials).However, in order to grow, new investments representing net additions to the capital stock are necessary. If we assume that there is some direct economic relationship between the size of the total capital stock, *K,* and total GDP, *Y*—for example, if $3 of capital is always necessary to produce an annual$1 stream of GDP—it follows that any net additions to the capital stock in the form of new investment will bring about corresponding increases in the flow of national output, GDP.

Suppose that this relationship, known in economics as the capital-output ratio, is roughly 3 to 1. If we define the capital-output ratio as *k* and assume further that the national net savings ratio, *s,* is a fixed proportion of national output (e.g., 6%) and that total new investment is determined by the level of total savings, we can construct the following simple model of economic growth:

1. Net saving (*S*) is some proportion, *s,* of national income (*Y*) such that we have the simple equation; S = sY.

2. Net investment (*I*) is defined as the change in the capital stock, *K,* and can be represented by ΔK such that   .

But because the total capital stock, *K,* bears a direct relationship to total national income or output, *Y,* as expressed by the capital-output ratio, *c,*it follows that

Or   and finally,

3. Finally, because net national savings, *S,* must equal net investment, *I,* we can write this equality as S=I.

We know that S=sY and so;

It   therefore   follows   that

Or simply

Dividing both sides by Y and then by c:

          ; note that   represents the rate of growth of GDP.

The final equation is a simplified version of the famous equation in the Harrod-Domar theory of economic growth, states simply that the rate of growth of GDP (Δ*Y/Y*) is determined jointly by the net national savings ratio, *s,* and the national capital-output ratio, *c.* More specifically, it says that in the absence of government, the growth rate of national income will be directly or positively related to the savings ratio (i.e., the more an economy is able to save and invest out of a given GDP, the greater the growth of that GDP will be) and inversely or negatively related to the economy's capital-output ratio.

Solow's Growth Model-
The Solow neoclassical growth model in particular represented the seminal contribution to the neoclassical theory of growth and later earned Robert Solow the Nobel Prize in economics. It differed from the Harrod-Domar formulation by adding a second factor, labour, and introducing a third independent variable, technology, to the growth equation. Unlike the fixed-coefficient, constant-returns-to-scale assumption of the Harrod-Domar model, Solow's neoclassical growth model exhibited diminishing returns to labour and capital separately and constant returns to both factors jointly. Technological progress became the residual factor explaining long-term growth, and its level was assumed by Solow and other neoclassical growth theorists to be determined exogenously, that is, independently of all other factors in the model.

More formally, the standard exposition of the Solow neoclassical growth model uses an aggregate production function in which

Where *Y* is gross domestic product, *K* is the stock of capital (which may include human capital as well as physical capital), *L* is labour, and *A* represents the productivity of labour, which grows at an exogenous rate. For developed countries, this rate has been estimated at about 2% per year. It may be smaller or larger for developing countries, depending on whether they are stagnating or catching up with the developed countries. Because the rate of technological progress is given exogenously (at 2% per year, say), the Solow neoclassical model is sometimes called an "exogenous" growth model, to be contrasted with the endogenous growth approach. α represents the elasticity of output with respect to capital (the percentage increase in GDP resulting from a 1% increase in human and physical capital). Since α is assumed to be less than 1 and private capital is assumed to be paid its marginal product so that there are no external economies, this formulation of neoclassical growth theory yields diminishing returns both to capital and to labour.

According to traditional neoclassical growth theory, output growth results from one or more of three factors: increases in labour quantity and quality (through population growth and education), increases in capital (through saving and investment), and improvements in technology.

Empirical Literature
Bachama., Hassan and Ibrahim B. (2021), Examine the role of human capital on economic growth in Nigeria using time series data covering the period from 1970-2019. Their data were sourced from Central Bank of Nigeria (CBN) statistical

bulletin and World Development Indicators of the World Bank. The data are analyzed using Autoregressive Distributed Lag model (ARDL). The study reveals that expenditure on health and education are found to be positively and significantly related with economic growth both in the short-run and long-run. However, labor negatively impact on economic growth and it was found to be significant. Again, trade openness and inflation are insignificant in explaining economic growth in this paper. Keji, (2021), empirically examines the nexus between human capital and economic growth in Nigeria between 1981 and 2017. This is predated by poor policy impact across the key sectors of the economy, such as education and health that would have transformed productivity to economic in Nigeria. In order to address this ugly happening, the study therefore employed vector autoregressive and Johansen techniques. The results disclosed that the estimated coefficients of human capital have long-run significant impact on economic growth in Nigeria. Also, the diagnostic tests were used to check the validity of the techniques adopted in the study. Interestingly, results from normality test, VEC residual serial correlation LM tests and VEC residual heteroskedasticity tests confirm the justification and validity of the estimated results obtained in this research.

Raymond., Ekponaanuadum (2021), investigate the impact of human capital development on the drive to achieving economic development in Nigerian. It adopted the Ex-post facto research design as the variables-Misery Index, GEH and GEE cannot be manipulated as they have previously occurred. The study span for a period of 38 years which covered from 1981 – 2018. Secondary data sourced from the statistical bulletin of the Central Bank of Nigeria and the world development index of the World Bank was utilized for this study. The study employed the ordinary least square (OLS) method and the Error Correction Model estimation technique to examine the long run relationship and short run dynamics of the variables. The result of the Johansen co-integration test established the presence of long run relationship between misery index, pupil teacher ratio, government spending on education and health. The result of the ordinary least square revealed a negative and significant relationship between misery index and pupil teacher ratio in the long run. The results of the short run analysis revealed that current level of pupil teacher ratio impact on the misery index in Nigeria negatively and significantly.

Literature Gap

It can be clearly observed in the empirical literature above that different studies have been carried out in economics to investigate the relationship between human capital and economic growth within and outside Nigeria. This is because human capital has a significant role in determining economic growth especially in developing countries like Nigeria. In the light of the above, this paper attempts to examine the role of human capital on economic growth in Nigeria in order to add knowledge to the existing literature. The study focused on the long-run and short-run effects of human capital on economic growth using ARDL model for the period 1981-2021. Most of the works reviewed scope stopped at 2019 but this present study extended its scope to 2021; hence the gap of the study.

II.   Methodology
Theoretical Framework

In order to appropriately capture the effect of human capital development on economic growth in Nigeria, this study will employ the augmented Solow human-capital-growth model adapted from Keji, (2021). The augmented Solow human-capital-growth model is an improvement on the Solow growth model. Solow's original model did not explicitly incorporate human capital. To achieve that, Mankiw, Romer, and Weil (1992) came up with the augmented Solow model. The justification for the inclusion of human capital in the model is the fact of non- homogeneity of labour in the production process either within a nation or across different economies due to their possession of different levels of education and skills. This modification facilitates the suitability and hence, the adaptation of this model for the Nigerian context. The basic assumption in this approach is that increase in workers' quality through improved education, improves output. The augmented Solow model is therefore specified as:

$$Q = AK^{\alpha}(hL)^{\alpha} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(3.1)$$

Where, Q= Output level or economic growth; K=Stock of physical capital; h=Level of Human Capital; L=Labor, measured by number of workers; A=Level of Total Factor Productivity; = Elasticity of capital input

International Journal of Humanities Social Science and Management (IJHSSM)
Volume 4, Issue 5, Sep.-Oct., 2024, pp: 417-429   **ISSN: 3048-6874**
www.ijhssm.org

with respect to output; while α = Elasticity of labour input with respect to output. Econometrically, the model is specified as follows:

$$Q = AK^{\alpha}(hL)^{\alpha}U \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(3.2)$$

When transformed into a log-linear form, we have,

$$\log Q = \alpha_0 + \alpha_0 \log K + \beta \log(hL) + W \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(3.3)$$

Where $\begin{aligned}\alpha_0 &= \log A \\ W &= \log U\end{aligned}$

To achieve a robust result in the context of the Nigerian environment, the augmented Solow human-capital-growth model would be modified to take an additional variable. The Expanded model is stated in equation 3.4 below;

Model Specification

$$GDPGR = \alpha_0 + \alpha_1 GEXE + \alpha_2 GEXH + \alpha_3 GFCF + \alpha_4 LPR + \varepsilon \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(3.4)$$

Where:

GDPGR = Gross Domestic Product Growth Rate
GEXE = Government Expenditure on Education
GEXH = Government Expenditure on Health
GFCF = Gross Fixed Capital Formation
LPR = Labor Participation Rate

Further, the work set out to present an Autoregressive Distributed Lag (ARDL) model of the relationship between selected components of population growth rate and unemployment in Nigeria. The ARDL (p, q) model is stated as:

$$\Delta GDPGR_t = \sum_{i=1}^{p}\alpha_i \Delta GDPGR_{t\text{-}i} + \sum_{i=0}^{q}\alpha_i \Delta GEXE_{t-i} + \sum_{i=0}^{q}\alpha_i \Delta GEXH_{t-i} + \sum_{i=0}^{q}\alpha_i \Delta GFCF_{t-i} + \sum_{i=0}^{q}\alpha_i \Delta LPR_{t-i} +$$

$$\sum_{i=1}^{p}\beta_i GDPGR_{t\text{-}i} + \sum_{i=0}^{q}\beta_i GEXE_{t-i} + \sum_{i=0}^{q}\beta_i GEXH_{t-i} + \sum_{i=0}^{q}\beta_i GFCF_{t-i} + \sum_{i=0}^{q}\beta_i LPR_{t-i} + \phi ECT + \varepsilon_t \dots\dots\dots\dots(3.5)$$

Where $ECT_t = Y_t - \alpha_0 - \sum_{i=1}^{p}\gamma_1 \Delta Y_{t-i} - \sum_{i=0}^{p}\beta_i \Delta X_{t-i}$ and $\phi = 1 - \sum_{i=1}^{p}\gamma_1 \Delta Y_{t-i} \dots\dots\dots\dots\dots\dots\dots(3.6)$

The Bound test procedure used equations 3.3 and 3.4 into 3.5 as:

$$\Delta Y_t = -\sum_{i=1}^{p-1}\gamma_1 Y * \Delta Y_{t-i} + \sum_{i=0}^{p}\beta_i \Delta X_{t-i} - \rho Y_{t-1} - \alpha - \sum_{i=0}^{p}\delta X_{t-i} + \mu_{it} \dots\dots\dots\dots(3.7)$$

Then we test the existence of level relationship as $\rho = 0$ and $\delta_1 = \delta_2 = ... = \delta_k = 0$

where Δ = difference operator, α = the short term coefficient, β = the long run coefficients μ = white noise error term.

Note: However, it is expected that all the independent variables have a positive relationship with dependent variable.

Pre-estimation
Unit Root Test

To fully explore the data generating process, we first examined the time series properties of model variables using the Augmented Dickey- Fuller test.

The ADF test regression equations with constant are:

$$\Delta Y_T = \alpha_0 + \alpha_1 Y_{T-1} + \sum_{j=1}^{k} a_j \, \Delta Y_{T-1} + \varepsilon_T \dots \qquad\qquad (3.8)$$

where Δ is the first difference operator ε_T is random error term that is iid k = no of lagged differences Y = the variable. The unit root test is then carried out under the null hypothesis α = 0 against the alternative hypothesis of α < 0. Once a value for the test statistics

$$ADF_\tau = \frac{\hat{\alpha}}{SE(\alpha)} ....(3.9)\, is \quad computed$$

we shall compare it with the relevant critical value for the Dickey-Fuller Test. If the test statistic is greater (in absolute value) than the critical value at 5% or 1% level of significance, then the null hypothesis of α = 0 is rejected and no unit root is present. If the variables are non-stationary at level form and integrated of the same order, this implies evidence of co-integration in the model.

Justification of the Model
The use of ARDL test approach is predicated on its several advantages over other cointegration tests such as Engle-Granger and Johansen's cointegration method. Firstly, the ARDL efficiently determines the cointegrating relation in small sample cases (Ghatak&Siddiki, 2001; Tang, 2003), whereas Johansen's method requires large sample for validity. Secondly, other methods requires that the variables must be integrated of the same order before the cointegration test is carried out, while the ARDL

approach can be applied irrespective of whether the regressors are *I(1) and I(0) or mutually* cointegrated, in which the dependent variable must be *I(1).*

Test of Significance
The significance test were tested at 5% level of significance using the coefficients of the independent variables and following the Rule: Reject the Null hypothesis if the t-prob is less than 0.05, otherwise accept the Null hypothesis when t-prob is greater than 0.05 i.e. Reject if t-prob <0.05, Accept if t-prob > 0.05

Test of Hypothesis
The Hypotheses were tested using the probability of f-statistics: Reject the Null hypothesis if the probability of f-statistics is less than the critical value (0.05), otherwise accept the Null hypothesis when critical value (0.05) exceeds probability of f-statistics.

Source of Data
The data for this study was sourced from United Nations World Population Prospects (2022) and WDI (2022); for the period of 1981 to 2021.

Data Presentation, Analysis and Interpretation
The data used in this study are; Gross Domestic Product Growth Rate (GDPGR), Government Expenditure on Education in Rate (GEXE), Government Expenditure on Health in Rate (GEXH), Gross Fixed Capital Formation in Rate (GFCF), and Labor Participation Rate

Unit Root Test

Table 4.1: Summary of ADF test results at 5% critical value

VARIABLE	ADF TEST STATISTICS	CRITICAL VALUE 5%	ORDER OF INTEGRATION	DECISION RULE
GDPGR	-3.135326	-2.938987	I (0)	Reject Ho
GEXE	-4.662962	-2.938987	I (1)	Reject Ho
GEXH	-6.393052	-2.938987	I (1)	Reject Ho
GFCF	-3.776135	-2.936942	I (0)	Reject Ho
LPR	-5.363893	-2.945842	I (1)	Reject Ho

Source: Authors computation 2023

From table 4.1 above, Gross Domestic Growth Product Rate (GDPGR), and Gross Fixed Capital Formation in Rate (GFCF), was integrated of order zero (I ~ (0)) as it was stationary at level form. While Government Expenditure on Education in Rate (GEXE), Government Expenditure on Health in Rate (GEXH), and Labor Participation Rate weren't not stationary at level form, but became stationary after first difference which implies that the variables (GEXE, GEXH,

and LPR) were integrated of order one (I ~ (1)). The decision is based on the fact the ADF statistics that is greater than the ADF critical values at 5%, we reject H_0 and conclude that the variables are stationary. Since the variables are integrated of order one and zero and none of the variables is integrated of order two. We therefore, apply the ARDL bound co-integration test.

ARDL Bound Co-integration Test

A necessary condition for testing for ARDL bound co-integrating test is that each of the variables be integrated of either of order one or zero or both (Pesaran, Shin and Smith, 2001). Since all the variables are integrated of order one and zero, we proceeded to estimate the ARDL bound test. The null hypothesis of ARDL bound co-integration is that the variables are not cointegrated as against the alternative that they are cointegrated. The decision rule is to reject the null hypothesis if the F-statistics is greater than the upper bound critical values at chosen level of significance.

Table 4.2: ARDL Bound Co-integration (5% critical value) Test Result for the models

Model	F-Statistics	K	Significance level	Critical Bound Value	
				10 (Lower Bound)	11 (Upper Bound)
	5.816128	4	5%	2.86	4.01

Source: Author's Computation 2023

From table 4.2 the F-statistics for the model is 5.816128and is greater than the upper (I1) bound of 4.01 at 5% level of significance. Thus, we reject the null hypothesis and conclude that there is a long run relationship between human capital development and economic growth in Nigeria. Since there is a long run relationship, we therefore estimate the short run and long run ARDL analysis.

Test for Short Run Relationship

Having ascertained that there exist a co-integrating relationship between human capital development and economic growth in Nigeria, the short run relationship needs to be ascertained.

Table 4.3: Summary of Parsimonious Short Run Relationship Result between humancapital development and economic growth in Nigeria

	Cointegrating Form			
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GEXE)	-0.004873	0.025600	-0.190343	0.8502
D(GEXH)	-0.004105	0.039294	-0.104461	0.9174
D(GFCF)	-0.200504	0.062467	-3.209745	0.0029
D(LPR)	-0.238754	0.129190	-1.848082	0.0733
CointEq(-1)	-0.881357	0.155247	-5.677133	0.0000

Cointeq = GDPGR - (-0.0055*GEXE -0.0047*GEXH -0.2275*GFCF - 0.2709
　　*LPR + 28.3890)

Source: Author's Computation 2023

From table 4.3 above; the coefficient of the error correction term (cointEQ) is statistically significant and carries the expected negative sign at 5% level of significant; revealing that a short run relationship exist between human capital development and economic growth in Nigeria. The speed of adjustment is -0.881357 that is 88% of the adjustment to equilibrium of the economic growth is expected to occur in short run.

Test for Long Run Relationship

It's imperative to ascertain the long run relationship that exists between human capital development and economic growth in Nigeria.

Table 4.4: Summary of Long Run Relationship between human capital development and economic growth in Nigeria Result

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GEXE	-0.005529	0.028758	-0.192246	0.8487
GEXH	-0.004657	0.044804	-0.103946	0.9178
GFCF	-0.227494	0.049987	-4.551032	0.0001
LPR	-0.270893	0.136578	-1.983439	0.0554
C	28.388974	8.254012	3.439415	0.0016

Source: Author's Computation 2023
Interpretation of Long Run ARDL Result
GDPGR = 28.388974 – 0.005529GEXE - 0.004657GEXH – 0.227494GFCF – 0.270893LPR

The long run coefficient from table 4.4 above shows that the joint impact of all exogenous variables (**GDPGR**, **GEXE**, **GEXH, and LPR**) on the endogenous variable will amount to 28.39 percent; this is on the basis that they are all held at constant. In other word if all the exogenous variables are held at constant it will amount to 28% contribution to economic growth in Nigeria.

Government Expenditure on Education (GEXE) possessed a negative insignificant relationship with economic growth in Nigeria with coefficient value of **– 0.0055 percent**; this entailing that on the long run, as Government Expenditure on Education (GEXE) increases by one percent, it causes **– 0.01 percent** decrease in economic growth in Nigeria.

.Government Expenditure on Health (GEXH) possessed a negative insignificant relationship with economic growth in Nigeria with coefficient value of **– 0.0047 percent**; this entailing that on the long run, as Government Expenditure on Health (GEXH) increases by one percent, it causes **– 0.01 percent** decrease in economic growth in Nigeria the same rate government expenditure on education.

Gross Fixed Capital Formation (GFCF) possessed a negative significant relationship with economic growth in Nigeria with coefficient value of **– 0.2275 percent**; this entailing that on the long run, as Gross Fixed Capital Formation (GFCF) increases by one percent, it causes **– 0.23 percent** decrease in economic growth in Nigeria.

Labor Rate Participation (LPR) possessed a negative insignificant relationship with economic growth in Nigeria with coefficient value of **– 0.2709 percent**; this entailing that on the long run, as Labor Rate Participation (LPR) increases by one percent, it causes **– 0.27 percent** decrease in economic growth in Nigeria.

Test of Hypotheses

The individual test was carried out to test for joint significance of the independent variables on the dependent variable at 5% level using t-probability and t-statistic shown in table 4.5 and 4.6. The rule applied was: If t-probability is greater than the prescribed level of 5% or 0.05, accept the null hypothesis, otherwise reject the null hypothesis when f-probability is less than 0.05.

Ho₁: Government Expenditure on Education has no statistically significant relationship with Economic Growth in Nigeria

Conclusion
From table 4.4 above, the probability of t-stat of **GEXE** was 0.8487, and greater than 0.05 critical values. Thus, we accept the null hypothesis and conclude that Government Expenditure on Education has no statistically significant relationship with Economic Growth in Nigeria

Ho₂: Government Expenditure on Health has no statistically significant relationship with Economic Growth in Nigeria

Conclusion
From table 4.4 above, the probability of t-stat of **GEXH** was 0.9178, and greater than 0.05 critical values. Thus, we accept the null hypothesis and conclude that Government Expenditure on Health has no statistically significant relationship with Economic Growth in Nigeria

Ho₃: Gross Fixed Capital Formation has no statistically significant relationship with Economic Growth in Nigeria

Conclusion
From table 4.4 above, the probability of t-stat of **GFCF** was 0.0001, and less than 0.05 critical values. Thus, we reject the null hypothesis and conclude that Gross Fixed Capital Formation has a statistically significant relationship with Economic Growth in Nigeria

Ho$_4$: Labor Participation Rate has no statistically significant relationship with Economic Growth in Nigeria

Conclusion

From table 4.4 above, the probability of t-stat of **LPR** was 0.0554, and greater than 0.05 critical values. Thus, we accept the null hypothesis and conclude that Labor Participation Rate has no statistically significant relationship with Economic Growth in Nigeria

III.   Discussion of Findings

This study examined the effect of human capital development on economic growth in Nigeria from 1981 to 2021; a period of 41 years. However, from the analysis it was discovered that government expenditure on education, government expenditure on health, and labor participation rate have a negative insignificant relationship with economic growth in Nigeria both in the long run and short run; though gross fixed capital formation have negative and significant relationship with economic growth. These results however, did not conform to apriori expectations. This study did not conform to the works of Some researchers like, Bachama., Hassan and Ibrahim (2021), who examine the role of human capital on economic growth in Nigeria using time series data covering the period from 1970-2019 reveals that expenditure on health and education are found to be positively and significantly related with economic growth both in the short-run and long-run; except for, labor that conform to the present study, that is, labor is negatively impacting on economic growth. In any case, this unconformity buttresses government insincerity in funding adequately the educational and health sector of the economy. The budget allocations to education and health have not exceeded 5.7% of the total budget, which did not reach the thresh hold of the United Nation 13.5% of the total budget hence this problem.

IV.   Summary of Findings, Conclusion and Recommendations

The following summarizes the result of the research work;

i. Government Expenditure on Education has a negative and insignificant relationship with economic growth in Nigeria.

ii. Government Expenditure on Health has a negative and insignificant relationship with economic growth in Nigeria.

iii. Gross Fixed Capital Formation has a negative and significant relationship with economic growth in Nigeria.

iv. Labor Participation Rate has a negative and insignificant relationship with economic growth in Nigeria

Recommendations

The following recommendations were made from the findings of this research;

i. Since Government Expenditure on Education has a negative and insignificant relationship with economic growth in Nigeria; the need for government to prioritize investment in education becomes imminent, that is if investment in education is judiciously adhered to, in the long run it will improve economic growth and development in the country.

ii. Since Government Expenditure on Health has a negative and insignificant relationship with economic growth in Nigeria; the government should as a matter of urgency increase investment in the health sector because its multiplier effects in the long run cannot be over emphasized

iii. though Gross Fixed Capital Formation was significant but it has a negative relationship on economic growth during the period of study; this prompt the need to improve credit delivery to the private sector though the financial system because its long run effect will stimulate economic growth and development in Nigeria.

iv. Labor participation in the country need to be inclusive in all the policies of the government, by so doing it will trigger improvement in efficiency utilization of human capital in the country.

Conclusion

This study examined the effect of human capital development, on economic growth in Nigeria from 1981-2021. The data used in this study were obtained from Central Bank of Nigeria Statistical Bulletin of various issues (2021) and WDI (2022). These comprises of annual data of the following variables Gross Domestic Product Growth Rate serves as the dependent variables in the model while Government Expenditure on Education, Government Expenditure on Health, Gross Fixed Capital Formation and Labour Participation Rate serves as the independent variables. The test statistics used in the analysis was; Auto Regressive Distributed Lag (ARDL). The results showed that; Government Expenditure on Education, Government Expenditure on Health, and Labour Participation Rate have a negative insignificant relationship with economic growth in Nigeria while Gross Fixed Capital Formation have negative and significant relationship with economic growth. The study concluded that human capital development is

one of the key determinant to any economy that wants to stimulate growth in every sector ; though the result of this study shows otherwise; however, it buttress the government insincerity in investing in education and health.

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