RELATIONSHIP BETWEEN HUMAN CAPITAL DEVELOPMENT AND ECONOMIC GROWTH IN NIGERIA

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ABSTRACT

Developing Nigeria's human capital is critical especially now that the country is aspiring to be among the 20 leading economies in the world by the year 2020. This study examines the relationship between human capital development and economic growth in Nigeria from 1981 to 2016 using annual time series data. Economic growth proxied by Real gross domestic product (RGDP and primary school enrolment was sourced from World Bank Development Indicators, (2017) while life expectancy (LEX) and adult literacy rate proxy for literacy rate was sourced from Central Bank of Nigeria Annual Report and Statement of Account of various publications. Johansen cointegration test, vector error correction mechanism, Vector Autoregressive (VAR) granger causality test was employed to analyse the data. Johansen cointegration test revealed that, human capital development has a long-run equilibrium relationship with economic growth in Nigeria at 5% level of significance. VAR granger causality test result shows that, economic growth (RGDP), life expectancy (LEX) and primary school enrolment (PSE) granger cause literacy rate (ALR) at 5% level of significant. It is recommended that, relevant policies and programmes such as unconditional cash transfers (UCTs) which are standard welfare programmes for schools should be made in order to increase effectiveness of both literacy rate and primary school enrolment so that they will have positive effect on economic growth.

Keywords: Human Capital Development, Economic Growth, Nigeria

1.0 Introduction

Human capital has been recognized globally as one major factor that is responsible for the wealth of nations. According to Smith (1776) human capital refers to the acquired and useful abilities of all the inhabitants or members of the society. The importance of human capital development to economic growth has been a motivating factor for scholars to examine the subject matter. Human capital refers to the abilities and skills of human resources of a country, while human capital development refers to the process of acquiring and increasing the number of persons who have the skills, education and experience that are critical for economic growth and development of a country's economy (Okojie, 2005).

The significance and relevance of human capital development in the achievement of meaningful and sustainable economic growth and development have been widely acknowledged in various studies (Olayemi, 2012; Kanayo, 2013 & Jaiyeoba, 2015). In the absence of substantial investment in the development of human capital in any country, sustained economic growth and development would only be a mere wish, never a reality. Therefore, the place of human capital development in economic growth cannot be overemphasized. Human capital development is a key prerequisite for a country's socio-economic and political transformation. Among the generally agreed causal factors responsible for the impressive performance of the economy of most of the developed and the newly industrializing countries is an impressive commitment to human capital development (Adedeji & Bamidele, 2003).

Developing Nigeria's human capital is critical especially now that the country is aspiring to be among the 20 leading economies in the world by the year 2020.

But this aspiration will be a venture in futility so long as human capital development is not accorded high priority. Human capital development is a prerequisite for Nigeria and Nigerians to become competitive in the 21st century globalize economy which is skill and knowledge based. A country's competitiveness in the New International Economic Order (NIEO) is strongly connected to the quality of her human capital. Hence human capital development is undoubtedly the pivot for any meaningful programme of economic development of Nigeria and indeed of any country (Ejere, 2011).

Human capital is increasingly believed to play an important role in the growth process. However, adequately measuring its stock remains a major challenge. In Nigeria, measuring human capital remains a major challenge. Several studies in the country have investigated the relationship between human capital and economic growth using various human capital measures. For instance, Vincent, Nwosu and Okonma (2013) used recurrent and capital expenditure as a measure of human capital without specifying whether the recurrent and capital expenditure in the study is health or educational expenditure. Olayemi (2012), Idenyi, Onyekachi and Ogbonna (2016) used total expenditure on education and health as a measure of human capital. But in this study, human capital development was proxy by life expectancy, literacy rate (proxy by adult literacy rate), and primary school enrolment while economic growth was proxy by real gross domestic product. More so, all the studies stopped at 2013 while this study has cover up to 2016. This study also examines the long-run relationship between human capital development and economic growth in Nigeria from 1981 to 2016. This study was guided by the following research questions: What is the pattern of human capital development and economic growth in Nigeria? What is the long-run equilibrium relationship between human capital development and economic growth in Nigeria? And what is the causal relationship between human capital development and economic growth in Nigeria?

The broad objective of this study is to examine the long-run relationship between human capital development and economic growth in Nigeria from 1981 to 2016. While the specific objectives are to: examine the pattern of human capital development and economic growth in Nigeria as well as investigate the causal relationship between human capital development and economic growth in Nigeria.

Following this introduction, the remaining part of this study is organized thus; Literature Review, Data and Method, Results and Discussions, Conclusion and Recommendations of the study.

2.0 Literature Review

2.1 Concept of Economic Growth

The concept of economic growth is one which has attracted the interest and focus of researchers worldwide. Bolton and Khaw (2006) stated that economic growth is the most fundamental indicator of an economy's health. They defined it as the rate of growth of the national income of a country, measured by the annual percentage rate of change of country's gross domestic product. According to Jhingan (2003) economic growth is defined as the process whereby the real per capital income of a country increase over a long period of time.

2.1.1 Determinants of Economic Growth

Determinants of economic growth are interrelated factors that directly influence the rate of economic growth i.e., increase in real GDP of an economy. These include the following: Natural resources, Human resources**,** Capital goods**,** Technology and efficient use of resources (Jhingan, 2003). These are explained briefly below.

i. Natural Resources: Natural resources include anything that exist in nature and which has exploitable economic value. Rate of economic growth increases on increase in quantity and quality of natural resources, examples of natural resources which can have major effects on the rate of economic growth include fossil fuels, valuable metals, oceans and wildlife (Jhingan, 2003).

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ii. Human Resources: Human resources include both skilled and unskilled workforce. Increase in the quantity and quality of the workforce increases the rate of economic growth. Here, increase in quality refers to improvement of skills the workers possess. When more people work, more goods and services are produced and when more people work, more goods and services are produced and when more skilled workers do a job, they produce high value goods and services (Jhingan, 2003).

iii. Capital Goods: Capital goods are tangible assets such as plant and machinery that can carry out processes which result in the production of other goods and services. Capital goods require big investment initially but they increase production and growth rate in future periods (Jhingan, 2003).

iv. Technology: Technology includes methods and procedures used to produce various goods and services. New technology may be improved gradually by investing in research. Better techniques once devised, allow faster production and increase rate of economic growth (Jhingan, 2003).

v. Efficiency factor: Achieving high output to input ratio, is the result of efficiency. Efficiency includes both productive and allocative efficiency. High efficiency increases growth rate when it is coupled with full employment. To achieve maximum growth rate, an economy must use its available resources in the least costly way to produce the optimum mix of goods and services and it must use its resources to the maximum extent possible (Jhingan, 2003).

2.1.2 Relationships between Human Capital Development and Economic Growth

According to Akingbade (2006) skills development, and by extension skills formation systems, are important because of their contributions to national productivity. Enhanced skills enable national economies raise production and create wealth. When people acquire skills, they make themselves more productive, able to produce more output and income for a given amount of time and effort. He found human capital to be a significant determinant of the amount of physical capital investment in an economy. He suggests that a more educated labour force can raise the returns to investment in physical capital, i.e., that skills and capital are complementary. The variation in investment rates in physical capital across countries is partly a function of absorptive capacity, which in turn depends on availability of human capital and other institutional factors.

The rate of return on investment in physical capital would appear to be a positive function of the supply of human capital; where the latter is scarce, the former is low, and so too is the incentive to invest. If so, raising levels of educational attainment should, ceteris paribus, increase returns to physical capital and thereby boost investment rates. Investment in physical capital, particularly capital equipment, is an important determinant of growth. Capital-skill complementarities largely reflect the skills required to master technologies in newly acquired capital equipment, specifically, more educated people are needed to operate higher-cost capital equipment incorporating sophisticated technology. He argued that globalization raises capital flows from developed to developing countries. This means that, even without technology imports, capital output ratios in developing countries rises and, given the complementarities between capital and skill, this would raise the relative demand for skilled labour. The acceleration of technical change in recent decades has been complemented by greater numbers of workers with higher skills. Without a workforce that is continuously acquiring new skills, it would be difficult to reap most of the returns from technological progress he said.

More so, advancement of knowledge and innovation, and the diffusion of new methods of production are aided by higher levels of education and training. As with capital-skill complementarity, complementarities also exist between technology and skills. According to him the stock of human capital appears to be positively correlated with technological dynamism. The introduction of new technologies in lower income countries implies a reallocation of labour from low to high productivity activities, the latter being generally both more capital and skill intensive. This means that increased technology imports are likely to be accompanied by a rising ratio of capital to labour, and by demand for skilled labour (Akingbade, 2006).

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2.2 Empirical literature review

Oluwatubi and Ogunrinola (2011) investigates the relationship between human capital development and economic growth in Nigeria from 1980 to 2008, using annual secondary data. Johansen co-integration technique and Error Correction Mechanism were employed in order to analysed the data. The result shows that there exists a positive long-run equilibrium relationship between human capital development and economic growth in Nigeria at 5% level of significance. The study stopped at 2008 while this study has cover up to 2016 to make it more current. Government education and health capital expenditure and government education and health recurrent expenditure was used as a proxy of human capital development in the study while this study has proxied human capital development with life expectancy rate, literacy rate (proxied by adult literacy rate) and primary school enrolment since any government education and health expenditure be it capital or recurrent is aimed at improving literacy rate and life expectancy respectively of its citizens.

Olayemi (2012) investigates the relationship between human capital investment and industrial productivity in Nigeria using annual secondary data spanned through 1978 to 2008. Johansen cointegration test, Error Correction Mechanism (ECM) was employed to examine the nexus between human capital investment and industrial productivity. Granger causality test was also adopted as a supplementary estimation method to explore the nature of causality among the variables established in the model. The study found that government expenditure on education maintained a positive long run relationship with index of industrial production, while government expenditure on health and Gross Capital Formation exhibited long run negative relationship with the dependent variable. Granger causality result shows a bidirectional causality between human capital investment and industrial productivity in Nigeria. The study stopped at 2008 and also uses total government education and health expenditure, gross capital formation as proxy for human capital development but this study has cover up to the year 2016 and has proxied human capital development with life expectancy rate, literacy rate (proxy by adult literacy rate) and primary school enrolment.

Vincent, Nwosu and Okonma (2013) examines the relationship between economic growth and government expenditure in human capital investment between 1980 and 2012, using annual Secondary data. Johansen cointegration test, Error correction mechanism and vector autoregressive (VAR) granger causality approach was adopted to analysed the data. Johansen cointegration test suggests that economic growth and human capital investment are cointegrated (i. e. they have a long-run equilibrium relationship) in Nigeria. Granger causality test reveals a unidirectional causality running from human capital investment to economic growth in the long run. The study used Johansen-Juselius cointegration to analysed the data even though the variables are not integrated of the same order without any restrictions. As such the study could have used Dynamic Ordinary Least Square Estimation or ARDL bond test technique in order to achieve its objectives. Also, while the study proxy human capital with capital and recurrent expenditure on human capital, this study has proxied human capital with life expectancy rate, literacy rate (proxy by adult literacy rate) and primary school enrolment.

Using the Error Correction Model as an analytical tool, Kanayo (2013) examines empirically the relationship between economic growth and human capital development in Nigeria from 1970 to 2010, using annual time series data. Error correction mechanism (ECM) was employed to analyse the data. In order to achieve linearity, logarithmic calculations were used to examine the variables. Findings shows that investment in human capital in the form of education and capacity building at the primary and secondary levels impact significantly on economic growth at 1% level of significance, while capital expenditure on education was not significant to the growth process at 5% level of significance. The study did not include expenditure on health as one of the indicator or determinant of human capital development as it only consider only recurrent and capital expenditure on education as a proxy for human capital development index and also uses real gross domestic product growth rate as a proxy for economic growth. But in this

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study, life expectancy rate, literacy rate (proxy by adult literacy rate) and primary school enrolment was used as proxy for human capital development while economic growth was proxied with real gross domestic product.

Jaiyeoba (2015) investigates the relationship between human capital development and economic growth in Nigeria, using annual time series data from 1982 to 2011. The study employs trend analysis, Johansen cointegration test and Ordinary Least Square technique to analysed the data. Empirical findings from Johansen cointegration test result however indicate that there is a long-run relationship between human capital development and economic growth in Nigeria. The Ordinary Least Square Estimation result shows that, a percentage increase in government health expenditure, gross capital formation, secondary school enrolment, tertiary school enrolment will lead to 0.16%, 0.004%, 0.001% and 0.102% respectively increase in economic growth while a percentage increase in government education expenditure and primary school enrolment will lead to 0.11% and 0.003% respectively decrease in economic growth. The study used OLS as one of the techniques of analysis even when the variables are not stationary at level (i.e all the variables are integrated of order one). The study also stopped at 2011 while this study has cover up to 2016 in order to make it more current and robust. Also, the study proxy human capital development with government education and health expenditure, gross capital formation, primary, secondary and tertiary school enrolment while this study proxied human capital development with life expectancy rate, literacy rate (proxy by adult literacy rate) and primary school enrolment.

Khan, Khattak and Khan (2015) concentrate their study on the relationship between human capital development and economic growth of Pakistan during the period 1971 to 2012, using annual time series data. Granger Causality test has been used as analytical technique for this purpose. The results show that human capital in form of research and development (R&D) Granger caused economic growth during the study period in Pakistan. Economic policies and government commitment in the development of human capital in Pakistan might be difference from that of Nigeria. Therefore, both the findings and recommendation of the study may not be the same as that of Nigeria. As such, this study tends to examine the relationship between human capital development and economic growth in Nigeria.

Idenyi, Onyekachi and Ogbonna (2016) examines the relationship between human capital development and growth of Nigeria economy from 1970 to 2013, using annual time series data. Johansen cointegration test and Error Correction Mechanism was used to analysed the data. The result shows a positive significant long-run equilibrium relationship between human capital development and economic growth in Nigeria at 5% level of significance. The study stopped at 2013 while this study is carried out to cover up to 2016. The study proxy human capital development with total government education and health expenditure and economic growth is proxy with gross domestic product growth rate. This study proxied human capital development with life expectancy rate, literacy rate (proxy by adult literacy rate) and primary school enrolment while economic growth was proxied with real gross domestic product.

In a most recent study, Kubalu, Mustapha and Suwaid (2017) investigates the relationship between human capital development and economic growth in Nigeria, using annual data during the period of 1995 to 2015. The study relies on the ARDL-ECM bounds testing approach to cointegration and granger causality to ascertain the long run relationship as well as speed of adjustment and direction of causality between human capital and economic growth in Nigeria. Findings revealed the existence of a long run relationship between human capital development and economic growth in Nigeria and that education index and health index as measures of human development are found to have a short run and long run negative impact on the economic growth over the period at 1% level of significance. Also, the estimated models performed well as the speed of adjustment is quite fast for the expected negative sign. This is further confirmed by the results of Granger causality test which indicated the existence of unidirectional causality running from health index to economic growth, whereas no causal relationship exists between education index and economic growth. The study stopped at 2015 while this study has cover up to 2016. Also, human capital development is proxy with health index based on life expectancy and education index based on years of schooling

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and adult literacy. This study proxied human capital development with life expectancy rate, literacy rate (proxy by adult literacy rate) and primary school enrolment.

3.0 Data and Methodology

This part of the study discusses the type and sources of data that are used in this research, model specification and techniques of data analysis.

3.1 *Source/ Method of Data Collection*

Annual time series data was used in this study. Real gross domestic product, Primary School Enrolment was sourced from World Bank Development Indicator (2017) from 1981 to 2016 while life expectancy rate and literacy rate (proxy by adult literacy rate) were sourced from Annual Report and Statement of Account of Central Bank of Nigeria (1985, 1990, 1995, 2000, 2005, 2010, 2015 & 2016) from 1981 to 2016. Economic growth proxy by real gross domestic product was transformed into logarithms in order to reduce the possibility of heteroskedasticity and also to make the interpretation of results in percentage.

3.2 Model specification

In order to understand the long-run relationship between human capital development and economic growth in Nigeria, this study adopt endogenous growth theory as developed by Lucas (1988) basically represents an extension of the Solow (1956) neoclassical growth model incorporating positive externalities related to the accumulation of human capital through knowledge. Following Schultz (1993), it can be argued that the production of human capital is possible through education (by increasing the literacy rate) and health (by increasing the life span of the people) sector. The model assumes the form:

$$Y_i = A \cdot F(\mu h L_i, K_i) \cdot H_a^{\gamma} \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad (3.1)$$

Where, A is the total factor productivity, Y_i is the output of the i[th] firm, L_i is the number of workers used by firm i, μ is the proportion of time that each worker devotes to production, h is the human capital of worker employed by the firm i, Ki is the physical capital used by firm i. H_a is the average human capital in the economy and γ is a positive coefficient. Here, effective labor input $\mu h L_i$ replaces the simple labor input L, specified in the standard Solow (1956) growth model. H_a^{γ} term is the externality effect of human capital, which raises economy-wide labour productivity. Mankiw, Romer and Weil (1992) explain the relationship as follow in a Cobb-Douglas production function with constant returns to scale:

$$Y = K_t^{\alpha} H K_t^{\beta} (A_t L_t)^{1-\alpha-\beta} \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad (3.2)$$

Where Y represents output, A is the level of technology. K, H and L are physical capital, human capital and labor respectively.

The VAR granger causality model specification for this study therefore was adapted from the work of Sede and Ohemeng (2015). The VAR granger model for this study can be specify as:

$$LRGDP_{\boldsymbol{t}} = \boldsymbol{\varphi_{1t}} + \sum_{i=1k}^{k} \pi_{1i} LRGDP_{t-1} + \sum_{i=1k}^{k} \theta_{1i} LEX_{t-1} + \sum_{i=1k}^{k} \delta_{1i} ALR_{t-1} + \sum_{i=1k}^{k} \vartheta_{1i} PSE_{t-1} + \boldsymbol{\varepsilon_{1t}} \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad (3.3)$$

$$LEX_{\boldsymbol{t}} = \boldsymbol{\varphi_{2i}} + \sum_{i=1k}^{k} \pi_{2i} LRGDP_{t-1} + \sum_{i=1k}^{k} \theta_{2i} LEX_{t-1} + \sum_{i=1k}^{k} \delta_{2i} ALR_{t-1} + \sum_{i=1k}^{k} \vartheta_{2i} PSE_{t-1} + \boldsymbol{\varepsilon_{2t}} \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad (3.4)$$

$$ALR_{\boldsymbol{t}} = \boldsymbol{\varphi_{3i}} + \sum_{i=1k}^{k} \pi_{3i} LRGDP_{t-1} + \sum_{i=1k}^{k} \theta_{3i} LEX_{t-1} + \sum_{i=1k}^{k} \delta_{3i} ALR_{t-1} + \sum_{i=1k}^{k} \vartheta_{3i} PSE_{t-1} + \boldsymbol{\varepsilon_{3t}} \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad (3.5)$$

$$PSE_{\boldsymbol{t}} = \boldsymbol{\varphi_{4i}} + \sum_{i=1k}^{k} \pi_{4i} LRGDP_{t-1} + \sum_{i=1k}^{k} \theta_{4i} LEX_{t-1} + \sum_{i=1k}^{k} \delta_{4i} ALR_{t-1} + \sum_{i=1k}^{k} \vartheta_{4i} PSE_{t-1} + \boldsymbol{\varepsilon_{4t}} \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad (3.6)$$

Where:

$LRGDP_t$ = Log of Real Gross Domestic Product

LEX_t = Life Expectancy.

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ALR_t = Literacy Rate proxied by Adult Literacy Rate (ALR).
PSE_t = Primary School Enrolment.
i = 1, 2, 3 and 4
k = Total number of lags.
α = Autonomous term.
π_{ji} = Coefficients of the log of Real Gross Domestic Product.
θ_{ji} = Coefficient of Life Expectancy
δ_{ji} = Coefficient of Literacy Rate
ϑ_{ji} =Coefficient of Primary School Enrolment
μ_{ji} = Stochastic Error Term

3.2.1 Johansen cointegration test model

Johansen cointegration test has been carry out since the variables are not stationary at level in order to find out if the long-run linear combination of the variables is stationary. This test can only be conducted if the variables are integrated of the same order. Therefore, the general frame-work model is presented in equation (3.7):

$$\mu_t = \beta_0 - \beta_1 LogRGDP_t - \beta_2 LEX_t - \beta_3 LR_t - \beta_4 LogPSE_t \quad (3.7)$$

Where:
$RGDP_t$ = Current value of real gross domestic product
LEX_t = Current value of life expectancy
LR_t = Current value of literacy rate (proxy by adult literacy rate)
PSE_t = Current value of primary school enrolment
Log = Logarithm Term
μ_t = Stochastic error term
β_0 = Constant
$\beta_1, \beta_2, \beta_3, \ and \ \beta_4$ = Coefficient of the variables.

4.0 Analysis and Results

This part focuses mainly on various tests such as descriptive statistics analysis, unit root test, co-integration technique, vector error correction test, VAR granger causality test. These tests were carried out respectively in order to achieve the objectives of the study.

4.1 Descriptive Statistics

Descriptive statistics analysis was conducted to ascertain the pattern of human capital development proxied by life expectancy (LEX), literacy rate proxied by adult literacy rate (ALR), primary school enrolment (PSE) and economic growth proxied by the real gross domestic product. The result of the analysis is presented on table 4.1

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Table 4.1: Descriptive Statistics of RGDP, LEX, ALR and PSE.

	RGDP	LEX	ALR	PSE
Mean	3.27E+13	53.02778	58.95556	94.08563
Median	2.24E+13	53.00000	57.00000	93.45864
Maximum	6.98E+13	54.00000	66.90000	112.8100
Minimum	1.52E+13	51.00000	54.00000	78.45744
Std. Dev.	1.81E+13	0.906362	5.414660	8.573546
Skewness	0.901870	-0.289966	0.624019	0.479671
Kurtosis	2.268370	1.840726	1.650502	2.723704
Jarque-Bera	5.683138	2.520354	5.068119	1.495014
Probability	0.058334	0.283604	0.079336	0.473546
Sum	1.18E+15	1909.000	2122.400	3387.083
Sum Sq. Dev.	1.15E+28	28.75222	1026.149	2572.699
Observations	36	36	36	36

Source: Author's computation using E-views 8.1, 2018

4.1.1 Pattern of Economic Growth (proxied by Real Gross Domestic Product (RGDP)) in Nigeria (1981-2016)

Based on the results of the descriptive statistical analysis in Table 4.1, economic growth proxied by real gross domestic product (RGDP) has an average value of 3.27E+13 over the period. It has a maximum value of 6.98E+13 and the minimum value is 1.52E+13. It has a standard deviation of 1.81E+13, which is low, suggesting that observations are clustered around the mean, thereby the distribution is not normal. The probability of its Jarque-Bera statistics is 0.06 suggesting that observation does not follow the normal distribution graph. The observation is positively skewed, as suggested by the result of skewness statistic of 0.90. The Kurtosis statistic suggest that the observation is a leptokurtic distribution, which has no fatter or wider peak than a normal distribution since the kurtosis statistic is not greater than 3.

4.1.2 Pattern of Life Expectancy (LEX) in Nigeria (1981-2016)

Life Expectancy (LEX) based on Table 4.1 has an average of 53.0 while the maximum value is 54.0 and the minimum value is 51.0. The variable has a standard deviation of 0.91, which is low and it suggest that observations are not normally distributed, but clustered around the mean. The skewness of the observation is -0.29. Meaning that, the observation is negatively skewed. The statistic of kurtosis 1.84 suggest that the observation is a leptokurtic distribution. The probability of its Jarque-Bera statistics of 0.28 suggest that the observation is not normally distributed.

4.1.3 Pattern of Literacy Rate (proxied by Adult Literacy Rate (ALR)) in Nigeria (1981-2016)

Literacy Rate (ALR) based on the descriptive statistics in Table 4.1 has an average value of 59.0, the maximum value of 66.9 and a minimum value of 54.0. Literacy rate (ALR) has a standard deviation of 5.41, suggesting that the observations are not clustered around the mean. Rather, they are randomly distributed. The probability of its Jarque-Bera statistics of 0.08 suggest that, the observation does not follow the normal distribution graph. The observation is positively skewed, as suggested by the result of skewness statistic of 0.62. The Kurtosis statistic of 1.65 suggest that the observation is a leptokurtic distribution, which has no fatter or wider peak than a normal distribution since the kurtosis statistic is less than 3.

4.1.4 Pattern of Primary School Enrolment (PSE) in Nigeria (1981-2016)

Based on descriptive statistic result in Table 4.1, primary school enrolment (PSE) has an average of 94.1, maximum value of 112.8 and the minimum value of 78.5. Its standard deviation is 8.57, suggesting that the observations are not clustered around the mean. Rather, they are randomly distributed. The probability of its Jarque-Bera statistics of 0.47

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means that, the observation does not follow the normal distribution graph. The observation is positively skewed, as suggested by the result of skewness statistic of 0.48. The Kurtosis statistic of 2.72 suggest that the observation is a leptokurtic distribution, which has no fatter or wider peak than a normal distribution.

4.2 Correlation Test

Correlation test has also been conducted on the variables in order to ascertain the degree of association among the variables and the result is presented thus:

Table 4.2: Correlation test result among RGDP, LEX, ALR and PSE (1981-2016)

	RGDP	LEX	ALR	PSE
RGDP	1.000000			
LEX	0.148236	1.000000		
ALR	0.948520	0.263987	1.000000	
PSE	-0.046744	0.168893	-0.149301	1.000000

Source: Author's computation using E-views 8.1, 2018

Based on the correlation result in Table 4.2, there is a weak positive correlation between economic growth proxied by real gross domestic product (RGDP) and life expectancy (LEX) with the correlation coefficient of 0.14. Meaning that, increasing life span of the labour force will have a positive influence on economic growth in Nigeria. A strong positive correlation also exists between economic growth proxied by real gross domestic product (RGDP) and literacy rate proxied by adult literacy rate (ALR) with the correlation coefficient of 0.95. This implies that, literacy rate has great positive influence on economic growth in Nigeria. Since economic growth is driven by technological progress, acquisition of basic skills and knowledge is therefore a fundamental pre-requisite for any meaningful development.

The result also revealed a weak negative correlation between economic growth proxied by real gross domestic product (RGDP) and primary school enrolment (PSE) with the correlation coefficient of -0.05. This implies that, primary school enrolment has no positive influence on economic growth and this may be associated with government negligence of most primary schools. Literacy rate proxied by adult literacy rate (ALR) and primary school enrolment (PSE) also has a weak positive correlation with life expectancy with the correlation coefficient of 0.26 and 0.17 respectively. Finally, there exist a weak negative correlation between literacy rate proxied by adult literacy rate (ALR) and primary school enrolment (PSE) in Nigeria with the correlation coefficient of -0.15.

4.3 Unit Root Test

A stationary test known as the unit root test has been conducted in order to find out if the variables contain unit root or not. Since most economic variables, particularly macroeconomic variables are believed to follow an upward trend, it is therefore necessary to subject the variables to a stationarity test. In this study, stationarity tests have been carried out using Augmented Dickey-Fuller unit root test on the log of real gross domestic product (LRGDP), life expectancy (LEX), literacy rate proxied by adult literacy rate (ALR) and primary school enrolment (PSE). The results are presented in Table 4.3

Table 4.3: Augmented Dickey-Fuller Unit Root Test of LRGDP, LEX, ALR and PSE (1981-2016)

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VAR.	Augmented Dickey-Fuller test			5% Critical Value			Order of integration
	At Level	At First Difference	At Second Difference	At Level	At First Difference	At Second Difference	
LRGDP	-2.285004	-4.651538	-8.119148	-3.544284	-3.548490	-3.552973	I(1)
LEX	-2.989582	-8.730656	-8.071172	-3.544284	-3.548490	-3.557759	I(1)
ALR	-3.283582	-7.044651	-5.748179	-3.544284	-3.552973	-3.568379	I(1)
PSE	-3.390746	-4.351941	-6.938976	-3.548490	-3.548490	-3.552973	I(1)

Source: Author's computation using E-views 8.1, 2018

Based on the unit root test results presented in Table 4.3 and 4.4 using 5% level of significance, economic growth proxied by log of real gross domestic product (LRGDP), life expectancy (LEX), literacy rate proxied by adult literacy rate (ALR) and primary school enrolment (PSE) are not stationary at levels when both intercept and trend were included in the test. But they became stationary at first difference at 5% level of significance. Hence, they are all integrated of order one [I(1)].

4.4 Cointegration Test

Since the variables of interest are not stationary at levels but at first difference, Johansen cointegration test was employed to find out if the linear combination of the variables is stationary. The result of the Johansen cointegration test is given in Table 4.4

Table 4.4: Cointegration test result of LRGDP, LEX, ALR and PSE (1981-2016)

Date: 07/28/18 Time: 20:06
Sample (adjusted): 1987 2016
Included observations: 30 after adjustments
Trend assumption: Linear deterministic trend
Series: LRGDP LEX ALR PSE
Lags interval (in first differences): 1 to 5

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.980688	196.0836	47.85613	0.0000
At most 1 *	0.869886	77.67294	29.79707	0.0000
At most 2 *	0.398606	16.49259	15.49471	0.0353
At most 3	0.040409	1.237436	3.841466	0.2660

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

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Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.980688	118.4107	27.58434	0.0000
At most 1 *	0.869886	61.18035	21.13162	0.0000
At most 2 *	0.398606	15.25516	14.26460	0.0348
At most 3	0.040409	1.237436	3.841466	0.2660

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: Author's computation using E-views 8.1, 2018

Based on the result of the Johansen Cointegration test in Table 4.4, the trace test indicates 3 cointegrating equations while the Max-eigenvalue indicates also 3 cointegrating equation at 5% level of significance. This finding therefore indicates an evidence of a long-run equilibrium relationship between economic growth proxied by the log of real gross domestic product (LRGDP) and human capital development proxied by life expectancy rate (LEX), literacy rate proxied by adult literacy rate (ALR) and primary school enrolment (PSE) in Nigeria from 1981 to 2016. The existence of the cointegration relationship is a good indication that the variables of interest actually move together in the long-run This outcome also confirm the study carried out by Oluwatubi and Ogunrinola (2011); Jaiyeoba (2015); Idenyi, Onyekachi and Ogbonna (2016); Kubalu, Mustapha and Suwaid (2017) that there exists a long-run relationship between economic growth and human capital development in Nigeria.

4.5 Vector Error Correction Test

Since the variables of interest are found to be cointegrated, vector error correction test has been conducted to determine the short run dynamics among the variables. This revealed the speed of adjustment from short run to long run equilibrium and the percentage of error that the variables are able to correct for short run disequilibrium in the long run. The result of the error correction test is given in Table 4.5

Table 4.5: Reduced Form of Vector error correction test result of LRGDP, LEX, ALR and PSE

Vector Error Correction Estimates
Date: 07/29/18 Time: 14:47
Sample (adjusted): 1984 2016
Included observations: 33 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Error Correction:	D(LRGDP)	D(LEX)	D(ALR)	D(PSE)
CointEq1	0.189214	-0.935212	16.09987	-1.641482
	(0.17058)	(2.02310)	(2.53232)	(11.1699)
	[1.10921]	[-0.46227]	[6.35775]	[-0.14696]
D(LRGDP(-1))	0.006568	1.574447	-0.892429	-5.909885
	(0.26724)	(3.16947)	(3.96723)	(17.4992)
	[0.02458]	[0.49675]	[-0.22495]	[-0.33772]
D(LEX(-1))	-0.007086	-0.344842	-1.164839	1.207493
	(0.01992)	(0.23628)	(0.29575)	(1.30453)
	[-0.35567]	[-1.45948]	[-3.93860]	[0.92561]
D(ALR(-1))	0.013116	0.016239	0.193716	0.393566

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	(0.01282)	(0.15201)	(0.19027)	(0.83925)
	[1.02331]	[0.10683]	[1.01814]	[0.46895]
D(PSE(-1))	0.004184	0.048925	-0.085502	0.542037
	(0.00329)	(0.03904)	(0.04887)	(0.21555)
	[1.27119]	[1.25320]	[-1.74971]	[2.51471]
C	0.041206	-0.004276	1.029832	-0.731305
	(0.01701)	(0.20171)	(0.25248)	(1.11369)
	[2.42274]	[-0.02120]	[4.07882]	[-0.65665]
R-squared	0.163304	0.289193	0.829868	0.323116
Adj. R-squared	-0.164098	0.011052	0.763295	0.058249
Sum sq. resids	0.115067	16.18485	25.35771	493.3684
S.E. equation	0.070731	0.838862	1.050004	4.631501
F-statistic	0.498787	1.039734	12.46546	1.219917
Log likelihood	46.54439	-35.06985	-42.47846	-91.45332
Akaike AIC	-2.214811	2.731506	3.180513	6.148686
Schwarz SC	-1.761324	3.184993	3.634000	6.602173
Mean dependent	0.041186	-0.003030	0.390909	-0.388359
S.D. dependent	0.065557	0.843536	2.158177	4.772585

Source: Author's computation using E-views 8.1, 2018

Based on the result of the error correction mechanism result given in Table 4.5, the error correction term for economic growth proxied by the log of real gross domestic product (LRGDP) and literacy rate proxied by adult literacy rate (ALR) is 0.189 and 16.10 respectively, hence they are wrongly signed and not statistically significant at 5% level of significance as required. Meaning that, they are not statistically significant in correcting the short-run disequilibrium. It also indicates that economic growth proxied by the log of real gross domestic product (LRGDP) is diverging away from the long-run equilibrium instead of converging. More so, the error correction term for life expectancy (LEX) and primary school enrolment (PSE) of -0.935 and -1.641 respectively are correctly signed but not statistically significant at 5% level of significance as required. Meaning that, they are not statistically significant in correcting the short-run disequilibrium.

The coefficient of R^2 indicates that about 16% of the variation in economic growth proxied by the log of real gross domestic product (LRGDP) is explained by life expectancy (LEX), literacy rate proxied by adult literacy rate (ALR) and primary school enrolment (PSE) while the remaining 84% is explained by other factors that is not captured in the model. The endogenous variables have explained about 29%, 83% and 32% of the variations in life expectancy (LEX), literacy rate (ALR) and primary school enrolment (PSE). Taking into consideration the degree of freedom, the adjusted R-squared shows that 16% of the dependent variable is explained by the explanatory variables.

4.6 VAR Granger Causality Test

This study attempts to determine the directions of the causal relationship between human capital development and economic growth in Nigeria during the period of the study. To achieve that, VAR granger causality test was employed in order to analysed the data.

Based on the VAR granger causality test result in Table 4.6, it is revealed that life expectancy (LEX), literacy rate proxied by adult literacy rate (ALR) and primary school enrolment (PSE) does not granger cause economic growth proxied by the log of real gross domestic product (LRGDP) in Nigeria at 5% level of significance. Meaning that, human capital development does not granger cause economic growth in Nigeria during the period of the study. The estimation also shows that economic growth proxied by the log of real gross domestic product (LRGDP), literacy

rate proxied by adult literacy rate (ALR) and primary school enrolment (PSE) does not granger cause life expectancy (LEX) at 5% level of significant.

More so, the result revealed economic growth (LRGDP) granger cause literacy rate proxied by adult literacy rate (ALR). This might be attributed to the fact that, meaningful economic growth will have positive trickledown effect on educational sector through building of more class rooms, library and even establishment of new schools which in turn increase literacy rate since (literacy rate) is one of the key indicators of the economic situation in a country as increased literacy rate leads to enhancement of a country's human capital. Life expectancy (LEX) was also found to granger cause literacy rate (ALR). This might be associated to the fact that, when people know that they have tendency of living long, this will encourage them to invest in themselves through acquiring more knowledge and skill so as to be more productive and relevant in their respective societies thereby increasing the level of literacy rate in the country. Primary school enrolment (PSE) is found to granger cause literacy rate (ALR) at 5% level of significance. This might be as a result of increase in primary school enrolment (PSE) will also increase the level of literacy rate in Nigeria.

The result further show that economic growth proxied by the log of real gross domestic product (LRGDP), life expectancy (LEX) and literacy rate proxied by adult literacy rate (ALR) does not granger cause primary school enrolment (PSE) at 5% level of significance. The outcome of this study contradicted the study carried out by Vincent, Nwosu and Okonma (2013) who investigate the relationship between economic growth and human capital investment from 1980 to 2012, found that, there is a unidirectional causality running from human capital investment to economic growth in Nigeria during the period

Table 4.6: VAR granger causality test result of LRGDP, LEX, ALR and PSE

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 07/29/18 Time: 15:10
Sample: 1981 2016
Included observations: 31

Dependent variable: LRGDP				
Excluded	Chi-sq	Df	Prob.	Decision
LEX	7.862376	5	0.1640	Accept Null
ALR	2.736817	5	0.7405	Accept Null
PSE	5.687749	5	0.3378	Accept Null
All	10.05119	15	0.8165	
Dependent variable: LEX				
Excluded	Chi-sq	Df	Prob.	Decision
LRGDP	2.585053	5	0.7636	Accept Null
ALR	2.585938	5	0.7635	Accept Null
PSE	1.515843	5	0.9112	Accept Null
All	8.227942	15	0.9143	
Dependent variable: ALR				
Excluded	Chi-sq	Df	Prob.	Decision
LRGDP	50.35551	5	0.0000	Reject Null
LEX	13.31309	5	0.0206	Reject Null
PSE	15.49968	5	0.0084	Reject Null
All	66.86465	15	0.0000	

Dependent variable: PSE

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Excluded	Chi-sq	Df	Prob.	Decision
LRGDP	2.894819	5	0.7162	Accept Null
LEX	5.520083	5	0.3557	Accept Null
ALR	2.806293	5	0.7298	Accept Null
All	11.91403	15	0.6855	

Source: Author's computation using E-views 8.1, 2018

5.0 Conclusion and Recommendations

This study examined the relationship between human capital development and economic growth in Nigeria from 1981 to 2016. The descriptive statistics test result revealed that, economic growth proxied by real gross domestic product (RGDP) has an average value of 3.27E+13 over the period. It has a maximum value of 6.98E+13 and the minimum value is 1.52E+13. Life expectancy (LEX) has an average of 53.0 while the maximum value is 54.0 and the minimum value is 51.0 in Nigeria during the period under study. Furthermore, the result also shows that literacy rate proxied by adult literacy rate (ALR) has an average value of 59.0, the maximum value of 66.9 and a minimum value of 54.0 during the period. Finally, Primary school enrolment (PSE) has an average of 94.1, maximum value of 112.8 and the minimum value of 78.5 in Nigeria. Based on correlation test result, there is a weak positive correlation between economic growth proxied by real gross domestic product (RGDP) and life expectancy (LEX). A strong positive correlation also exists between economic growth and literacy rate proxied by adult literacy rate (ALR). The result also revealed a weak negative correlation between economic growth (RGDP) and primary school enrolment (PSE) in Nigeria during the period of the study. Life expectancy (LEX) has a weak positive correlation with literacy rate proxied by adult literacy rate (ALR). A weak positive correlation also exists between life expectancy (LEX) and primary school enrolment (PSE). Finally, there exist a weak negative correlation between literacy rate proxied by adult literacy rate (ALR) and primary school enrolment (PSE) in Nigeria. More so, Johansen Cointegration test revealed an evidence of a long-run equilibrium relationship between economic growth proxied by the log of real gross domestic product (LRGDP) and human capital development proxied by life expectancy rate (LEX), literacy rate proxied by adult literacy rate (ALR) and primary school enrolment (PSE) in Nigeria from 1981 to 2016.

Based on the findings of this study, the following recommendations are put forward: firstly, Government and the private sector should join hands together by mobilizing resources to furnish hospitals with quality medical laboratories and trained personnel while educational institute should also be equipped with necessary facilities such as libraries, science laboratory for practical, computer laboratories and modern instructional materials in order to improve the quality of education and health which in turn enhance human capital development, labour productivity and ensure sustainable growth and development and secondly, there is need to give more autonomy in financial management in public educational institutions. The autonomy will improve their financial situation by improving the efficiency and effectiveness of resource use and cutting costs. Besides, public educational institutions should be encouraged to develop resource mobilization strategies, in order to generate revenue by themselves. For this purpose, educational foundations can be set up in order to mobilize financial support from private donations.

References

Adedeji, S. O., & Bamidele, R. O. (2003). Economic Impact of Tertiary Education on Human Capital Development in Nigeria. *Human Resource Development in Africa. 2002 Annual Conference* (pp. 499-522). Nigerian Economic Society.

Akingbade, B. (2006). *Meeting the Challenges of Human Capital Development in Nigeria: The Case of Reforms in our Educational Policies and System.* Being Paper Presented by CMO of MTN at the Alumni Convocation Lecture of the University of Nigeria Nsuka.

Becker, G. S. (1964). Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education. National Bureau of Economic Research. New York; 2nd edition, NBER, New York, 1975; 3rd ed, University of Chicago Press, Chicago, 1993.

Bleakley, H. (2010). "Health, Human Capital, and Development". *Annual Review of Economics* 2(3): 283-310.

Bloom, D. E, Canning, D., Sevilla J. (2001). The Effect of Health on Economic Growth: Theory and Evidence. NBER Working Paper No 8587.

Central Bank of Nigeria (1985). *Annual Report and Statement of Account.* Central Bank of Nigeria Research Department press

Central Bank of Nigeria (1990). *Annual Report and Statement of Account.* Central Bank of Nigeria Research Department press

Central Bank of Nigeria (1995). *Annual Report and Statement of Account.* Central Bank of Nigeria Research Department press

Central Bank of Nigeria (2000). *Annual Report and Statement of Account.* Central Bank of Nigeria Research Department press

Central Bank of Nigeria (2005). *Annual Report and Statement of Account.* Central Bank of Nigeria Research Department press

Central Bank of Nigeria (2010). *Annual Report and Statement of Account.* Central Bank of Nigeria Research Department press

Central Bank of Nigeria (2015). *Annual Report and Statement of Account.* Central Bank of Nigeria Research Department press

Central Bank of Nigeria (2016). *Annual Report and Statement of Account.* Central Bank of Nigeria Research Department press

Central Bank of Nigeria (2016). *Annual Statistical Bulletin*. Central Bank of Nigeria Statistical Department press

Eisner, R. (1985). The Total Icome System of Account. *Survey of Current Business*, 65(1): 24-48.

Ejere, S. I. (2011). Human Capital Development as Catalyst for National Development: Nigeria in Perspective. *International Business and Management Journal*, 2(2): 98-104.

Engle, R., & Granger, C. (1987). Cointegration and Error Correction: Representation, Estimation and Testing. *Econometrica*, 55(2): 251-276.

Farr, W. (1853). Equitable Taxation of Property. *Journal of the Royal Statistical Society*, 16(3): 1-45.

Fuchs, V. R. (1982). Economic Aspects of Health, Time preference and health: an exploratory study, In Fuchs, V. R. (ed) National Bureau of Economic Research, New York, p. 93–120.

Glaeser, E. L., Kolko, J., & Saiz, A. (2001). Consumer city. *Journal of economic geography* 1(1): 27-50

Grossman, M. (1972). The Human Capital Model of Demand for Health. NBER Working Paper No.7078, [Online]. Retrieved on 6th July 2017 from: http://www.nber/w7078.

Idenyi, O. S., Oyekachi, R. E., & Ogbonna, O. S. (2016). Analysis of the Relationship Between Human Capital Development and Economic Growth in Nigeria. *European Journal of Accounting, Auditing and Finance Research*, 4(3): 56-71.

Idrees, A. S., & Siddiqi, M. W. (2013). Does public education expenditure cause economic growth? Comparison of develop and developing countries. *Pakistan journal of commerce and social science* 7(1): 174-183.

Jaiyeoba, S. V. (2015). Human Capital Investment and Economic Growth in Nigeria. *An International Multidisciplinary Journal, Ethiopia*, 9(1): 30-46. Retrieved on 6th July, 2017 from http://dx.doi.org/10.4314/afrrev.v9i1.4

Jorgenson, D. W., & Fraumeni, B. M. (1989). *The Accumulation of Human and Non-Human Capital,* 1948-84. In Lipsey, R. E. & Tice, H. S. (eds). *The Measurement of Savings, Investment and Wealth (pp. 227-282).* Chicago, IL: University of Chicago Press.

Kanayo, O. (2013). The Impact of Human Capital Formation on Economic Growth in Nigeria. *Journal of Economics*, 4(2): 121-132.

Kendrick, J. (1976). *The Formation and Stock of Total Capital.* New York: Columbia University Press for NBER.

Khan, J., Khattak, N. U., & Khan, A. (2015). Human Capital and Economic Growth Nexus: A Causality Analysis for Pakistan. *City University Research Journal* , 5(2): 279-290.

Khaw, B. W. (2006). *Preparedness for pandemic influenza: the avian dimension and other emerging diseases.* Opening speech by the minister for health the Lancet Asian Medical Forum in Singapore, 3 May. Available at http://www.moh.gov.sg/mohcorp/speeches.aspx?id=2084 (accessed October 2006).

Kiker, B. F. (1966). The Historical Root of the Concept of Human Capital. *Journal of Political Economy*, 74(5): 481-499.

Kubalu, A. I., Mustapha, A. M., & Suwaid, Z. S. (2017). A Dynamic Analysis of the Relationship Between Human Development and Economic growth in Nigeria. *International Journal of Advanced Studies in Economics and Public Sector Management* , 5(1): 1-21. Retrieved on 6th July, 2017 from http://internationalpolicybrief.org/journals/international-scientific-research-consortium-journals/intl-journal-of-economics-vol5-no1-jan-2017

Le, T., Gibson, J., & Oxley, L. (2005). Cost and Income Based Measure of Human Capital. *Journal of Economic Survey*, 17(3): 271-307.

Lucas, R. E., (1988). On the Mechanics of Economic Development. *Journal of Monetary Economics* 22(4): 3-42.

Machlup, F. (1962). *The Production and Distribution of Knowledge in the United State, Princeton, N.J.* Princeton: Princeton University Press.

Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A Contribution to the Empirics of Economic Growth. *Quarterly Journal of Economics*, 107(4): 407-438.

Moretti, E. (2004). *Human Capital Externalities in Cities.* Handbook of Urban and Regional Economics, North Holland-Elsevier

Mushkin, S. J. (1962). Health as an Investment. *Journal of Political Economy.* 70(5): 129-157.

OECD, (1996). *Knowledge Based Economy.* Paris: Organization for Economic Cooperation and Development (OECD) Publishers.

OECD, (2001). *The Well-Being of Nations: The Role of Human and Social Capital, Education and Skills.* Evaluative Report: OECD, Paris (France).

Okojie, C. E. (1995). Human Capital Formation for Productivity Growth in Nigeria. *Nigerian Economic and Financial Review*, 1(6): 44-55.

Okojie, O. O. (2005). Health Promotion Perception among Community Pharmacists in Nigeria. *International Journal of Pharmacy practice,* 13(3): 213-221

Olayemi, S. O. O. (2012). Human Capital Investment and Industrial Productivity in Nigeria. *International Journal of Humanities and social studies*, 2(16): 298-307.

Oluwatobi, S. O., & Ogunrinola, I. O. (2011). Government Expenditure on Human capital Development: Implications for Economic Growth in Nigeria. *Journal of Sustainable Development*, 4(3): 72-80. Retrieved on 6th July, 2017 from http://www.ccsenet.org/jsd

Petty, W. (1690). *Political Arithmetik.* United Kingdom: Reprinted in Hull (1899).

Qian, H., Acs, Z. J., & Stough, R. (2012). Regional System of Entrepreneurship: Nexus of human capital, Knowledge and New Firm Formation. *Journal of Economic Geography* 1(1): 112-149

Schultz, T. W. (1961). Investment in Human Capital. *American Economic Review*, 3(1): 1-17.

Schultz, T. W. (1993). The Economic Importance of Human Capital in Modernization. *Educational Economics*, 1(1): 13-19.

Sede, P. I & Ohemeng, W. (2015). Socio-economic Determinant of Life Expectancy in Nigeria (1980-2011). *Health Economics Review,* 5(2): 1-5.

Smith, A. (1776). *An Enquiry into the Nature and Causes of Weath of Nations* . London: Oxford Paperbacks Publishers.

Solow, R. M (1956). A contribution to the theory of economic growth. The Quarterly Journal of Economics, 70(1): 65-94. Retrieved on 6th July, 2017 from http://www.jstor.org

Victora, C. G., Adair, L., Fall, C., Hallal, P. C., Martorell, R., Richter, L & Sachder, H. S. (2008). Maternal and child under nutrition: consequences for adult's health and human capital. *Lancet* 371(9609):340-357

Vincent, M. O., Nwosu, C. D., & Okonma, M. C. (2013). Investment in Human Capital and Economic growth in Nigeria (1980-2012). *Journal of Economics and Finance*, 2(2): 41-50. Retrieved on 6th July, 2017 from www.iosrjournals.org

World Bank. (1996). *World Development Report.* New York: Oxford University Press.

World Bank (2015). World Development Indicators, Data Base

World Bank (2017). World Development Indicators, Data Base