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Information Communication and Technology, Human Capital Development and the Health Sector of Nigeria

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Abstract

This study investigates the profound impact of Information and Communication Technology (ICT) and human capital development (HCD) on the health sector. As healthcare systems worldwide face escalating challenges, the integration of ICT and investment in human capital emerge as pivotal strategies to enhance healthcare delivery. Through a comprehensive analysis of existing literature and empirical evidence, this research explores the multifaceted implications of ICT and human capital development on the health sector. This study aimed to examine the impact of ICT and HCD on the Health sector in Nigeria using Quarterly time series data from 2000Q_1 to 2023Q_4. The analysis employed various statistical techniques, including unit root tests, co-integration analysis, ordinary least squares estimation, and Granger causality tests. The findings of this study is in line with previous studies. The findings of this study provide valuable insights into the relationship between ICT and HCD on health sector. The results indicate that ICT and Human capital development has a positive relationship and impact which conforms to the findings of previous studies. Through empirical analysis, this study assesses the tangible impact of ICT integration and human capital development on key performance indicators within the health sector, including healthcare accessibility, quality of care, cost-effectiveness, and patient satisfaction. Findings suggest a positive correlation between ICT adoption, human capital investment, and improvements in healthcare delivery metrics. These findings underscore the importance of Increased Healthcare Funding, Strengthening Primary Healthcare, Healthcare Infrastructure Development and Health Workforce Development as a means to improve Health sector in Nigeria.

I. Introduction

Nigeria's economy is a diverse, middle-income, and developing market with growing sectors in the manufacturing, finance, service, health, communications, technology, and entertainment industries. Its economy is the biggest in Africa, the 27th largest in terms of purchasing power parity, and the 39th largest in the world in terms of nominal GDP. According to Nigerian law, the country's health sector was created to essentially offer medical services to all Nigerians, regardless of where they live inside its borders. The concurrent legislative list that gives the federal, state, and local governments the authority to enact laws pertaining to health issues includes the health

sector. Thus, the National Health Policy and Nigeria's health care delivery services are designed to address the provision of intensive, effective, and efficient health care services to Nigerians so that they can attain noble health standards and enjoy life at all levels of human endeavor, regardless of where they live within Nigeria's territorial jurisdiction.

Human capital development (HCD) and the integration of information and communication technology (ICT) have both advanced significantly in Nigeria's health industry in recent years. While these developments hold the promise of improving healthcare delivery, it is critical to systematically examine the interaction between ICT implementation and HCD within the healthcare workforce. Despite the power of ICT in healthcare, there is evidence suggesting that integrating digital technologies into routine healthcare practices in Nigeria is not uniform. How ICT has integrated and impacted healthcare service delivery remains unclear. While the adoption of ICT and HCD are individually recognized as crucial components of healthcare improvement, the specific impact of their combined influence on healthcare outcomes in Nigeria remains inadequately explored. Determining the extent to which these factors contribute to enhanced patient care and public health is essential for evidence-based policymaking. The health policies even when they are formulated, lack proper coordination neither are they related to any economic target. Since the country's independence in 1960, health policies have been stated in a variety of ways, either as explicit choices or in National Development Plans. In addition, the political unrest and the unstable economic system have significantly hampered the development, execution, monitoring, and assessment of healthcare policies. Due to the repeated transitions of government from the civilian to the military and back again, with diverse policies, there has been no continuity of policy. To put it simply, the beneficial policies that one regime started were either badly executed or frustrated, which went against the original objective of the policy's creator. Additionally, gross underfunding is a severe social ill that is destroying Nigerian healthcare facilities. The Nigerian health system falls short of the WHO standard of 15% of the overall budget due to the health sector's meager fiscal allocation. It is implied that the fund is not properly budgeted for and promptly disbursed to medical facilities, or even life-saving organizations.

The sustainability of ICTs depends on implementing relevant ICT learning and training programmes (World Bank, 1997; Braa et al. 1995; World Bank, 1999a; Kimaro and Nhampossa, 2005). When people are able to use, maintain, develop, and sustain ICTs, they can influence organizational work practices (Braa et al., 1995; Walsham, 2000). If not, ICTs become outdated and underutilized, wasting resources without contributing to economic progress in poor nations (Indjikian and Siegel, 2005). In order to optimize the social benefits on IT investment, developing nations need to tackle two major issues Indjikian and Siegel (2005, P. 1). They need to address "a lack of knowledge of best practices in IT usage." Secondly, learning and training are required to solve "IT-related skill deficiencies in the workforce." Learning and training entails establishing routines for support and maintenance as well as adapting ICTs to new environments (Kenny, 2000; Braa et al. 1995).

The acquisition of ICTs in the health sector in short term training and without appropriate strategies is not enough as it creates a great burden as a result of ineffective usage and training, lack of maintenance, and failure to fulfil the promise of improved health services. The capacity of existing human resources needs upgrading based on particular needs and work at each health sector levels. This can be done through appropriate and well-designed training and creating a conducive, enabling and open learning environment. However, this requires long term strategies beyond the first life cycle support. It also requires support and a strong commitment from the local government and the donors to continuously mobilize resources for sufficient training and building basic analysis and long term ICT skills. The training needs to be viewed as a continuous process to allow workers to learn from practice and experiences and to respond to organizational and ICT changes (UNDP, 1994; Paul, 1995) at all levels of the health sector to facilitate a sustainable Health sector. The primary issue that prompted this study is the difference in access to healthcare information between urban and rural areas, lack of health care experts and services and their inability to satisfy the needs of the nation's citizens. The critical questions are what is the impact of ICT, HCD on the Health sector? What is the direction of the causal relationship between HCD and ICT on the Health sector? Is there a long-run relationship between HCD and ICT on Health sector? The rest of the paper is presented as follows. Section two reviews the literature; section three addresses the methodology, while section four is the data analysis and discussion. Section five concludes the paper with some policy recommendations.

II. Literature Review

2.1 Conceptual and theoretical Issues

ICT has progressed from the usage of papyrus to huge computers, mini computers and microchips with a vast dataset containing a series of information that are implemented in all areas of the economy in order to increase production efficiency. Today, ICT is widely used in numerous sectors of the business to alleviate the load of doing several tasks. Communication technologies such as the internet, wireless network, mobile phones, personal computers, software, video conferencing, social networking and other media applications and services enabling users to access, retrieve, store, transmit and manipulate information in a digital form are also included.

HCD is a part of human resource management that provides a learning platform for enhanced growth, productivity and effective performance (Kadiresan; Longoni and Cagliano 2000,). Human capital refers to the abilities and skills of human resources and HCD refers to the process of acquiring and increasing the number of persons who have the skills, education and experience which are critical for the economic growth of the country (Harbison, 1962). Health is necessary for productivity and to fully enjoy life. Health emphasizes physical abilities, social and personal wellness, and it is a positive idea that is useful for daily living rather than the goal of life.

Theoretically, a workforce with greater knowledge and competence makes it simpler for a firm to embrace and use new technology, hence increasing the return on investment made in education and training. Empirical studies provide evidence supporting the aggregate effects of education and training. This theory shows how education leads to increase in productivity and efficiency of

workers by increasing the level of their cognitive skills. Gory Bucker, Jacob Mincer, Theodore Schultz, proposed the idea that people should invest in education in order to expand their human capital, which can be created by fusing natural aptitudes with human capital (Babalola, 2000). Investments in education, health, nutrition, and on-the-job training are a few examples of these. However, only when gross investment surpasses depreciation over time, whether due to heavy or infrequent use, can the stock of human capital grow. According to proponents of the human capital theory, investing in education is a productive use of HCD and is just as valuable as or even more so than investing in physical capital. Basic literacy increases the productivity of workers in low-skilled occupations, according to human capital specialists. They add that workers in high-skilled professions and positions have higher marginal productivity when they get education that requires logical and analytical reasoning as well as technical and specialized knowledge. Further, the more education society has access to, the higher the level of economic growth and national production.

Empirical Literature

A review of related literature has shown conflicting and mixed findings. However, this paper aims to resolve the conflict in the literature by analyzing the impact of HCD and ICT on health sector development rather than economic growth or development as reviewed by Odo, Idenyi and Eze, Onyekachi and Onyeisi, Ogbonna, Samuel (2016), Adeyemi and Olalekan (2014) in their works. Other research gaps includes resolving technological deficiency, untrained and unskilled manpower in the sector which was also a gap stated in the study of Khatun, Fatema and Khanam Sima, Mst. Rokshana(2015). However, this paper attempts to close the gap existing in the body of knowledge, since over time there has been no investigation into the impact of HCD and ICT on health sector development.

III. Methodology

3.1 Model Specification

The regression approach adopted is based on equations for life expectancy. The model specification is in line with the literature which explains the link by which ICT and human development indicators affect health outcomes (see Anyanwu and Erhijakpor 2007). Accordingly the functional, mathematical and economic specification is presented below.

The functional form of the model specification:

LEXP= F (MCS, GEE, GDP, INFLA) ……1

The mathematical form of the model specification:

$LLEXP_t = \beta_0 + \beta_1 MCS_t + \beta_2 GEE_t + \beta_3 GDP_t + \beta_4 INFLA_t$ ……..2

The econometric form of the model specification:

$LLEXP_t = \beta_0 + \beta_1 MCS_t + \beta_2 GEE_t + \beta_3 GDP_t + \beta_4 INFLA_t + \mu_t$

Where: LEXP = Life expectancy, MCS= Mobile cellular subscription, GEE= Government expenditure on education, GDP= Gross domestic product, INFLA= Inflation, μ_t= The random or stochastic variable, β_0= The intercept term

β_1, β_2, β_3, β_4 = Regression parameters and slopes of the respective explanatory variables.

IV. Data Analysis and Discussion

4.1 Preliminary Descriptive Statistic

Table 4.1: Descriptive statistics of the variables

	LNLEXP	LNMCS	LNGDP	LNGEE	INFLA
Mean	3.924472	3.015763	12.64692	5.297067	12.34278
Median	3.934774	4.022719	12.73546	5.462451	12.38103
Maximum	3.968592	4.585300	12.84596	6.472026	18.87365
Minimum	3.854246	-3.712368	12.24048	3.685940	5.388008
Std. Dev.	0.035217	2.175459	0.180616	0.840668	3.579817
Skewness	-0.553654	-1.813411	-0.913697	-0.286995	-0.061361
Kurtosis	2.063521	5.427073	2.657004	1.790626	2.226007
Jarque-Bera	7.711457	69.82993	12.67573	6.570851	2.251795
Probability	0.021158	0.000000	0.001768	0.037425	0.324361
Sum	345.3535	265.3871	1112.929	466.1419	1086.165
Sum Sq. Dev.	0.107900	411.7380	2.838115	61.48482	1114.913
Observations	90	90	90	90	90

Source: Author's computation

Table 4.1summarizes the descriptive statistics of the variables used. The mean, median, minimum, and maximum values are shown, as well as the standard deviation, which measures the dispersion of the data. The mean value represents the average value of the variables in the set. LNLEXP, LNMCS, LNGDP, LNGEE, and INFLA has a mean Value of 3.924472, 3.015763 12.64692,5.297067, 12.34278. The median values are also close to each other, indicating that there are no outliers. For the standard deviation not, all variables are less than 0, and some are greater, indicating that some are constant and while some are not. The Jarque-Bera statistics and Kurtosis value indicate that all variables are normally distributed. There are 88 observations for each variable, also indicating that there is no missing data. The number of observations is sufficient to make an efficient and meaningful estimate.

4.2 Co-Integration Test

The co-integration test procedure is conducted to establish a long run relationship among the variables under consideration. According to Gujarati (2004), two variables are said to be co-integrated if they have a long run or equilibrium relationship between them. The purpose of the

co-integration test is to determine whether a group of non-stationary series is co-integrated or not. Therefore, the hypothesis to be used here is stated below

H_0: There is no long-run relationship

H_1: There is a long-run relationship

Decision rule: Reject H_0 if the trace statistics are greater than the critical values at 5% level of significance and accept if otherwise.

The result is shown in the table 4.2.1 below:

TABLE 4.2.2 Johansen Co-Integration Test

NUMBER OF COINTEGRATING EQUATION	EIGEN VALUE	TRACE STATISTICS	5% CRITICAL VALUE	PROB.
None *	0.270694	79.99242	69.81889	0.0062
At most 1 *	0.245912	53.16119	47.85613	0.0146
At most 2	0.207965	29.17029	29.79707	0.0589
At most 3	0.089993	9.352518	15.49471	0.3338
At most 4	0.015604	1.336772	3.841465	0.2476

Source: Author's Computation Using E-Views

From the table above, there is an asterisk where trace statistics is greater than the critical value. In the table, the trace statistics from none to at most 1 are greater than the critical value at 5% level of significance, respectively. This shows the possibility of rejecting the null hypothesis that says there are no co-integrating vectors at 5% level of significance. Conclusively, there is a long-run relationship between the regressors and the regressed.

4.3: Granger Causality Test.

The granger causality test helps in testing the existence of causality and determines its direction. Having tested the long-run relationship of the variables, we investigate the type of causality between variables. The direction of causality can be determined by comparing the f-statistic of the two variables. The variable with the highest value of f-statistic indicates where causality runs from.

The causality table is shown in table 4.3 below:

TABLE4.3. Granger Causality Test Result.

NULL HYPOTHESIS	F- STATISTICS	P-VALUE
GEE does not Granger Cause LEXP	1.81004	0.1522
MSC does not Granger Cause LEXP	0.54511	0.6529
GDP does not Granger Cause LEXP	1.03662	0.3811

LEXP does not Granger Cause GEE	1.96583	0.1260
LEXP does not Granger Cause MSC	5.95369	0.0010
LEXP does not Granger Cause GDP	1.97571	0.1245

Source: Authors Computation Using E-Views

The result obtained from the table above shows that none of the variables is Granger causing each other. In Granger causality test, the decision rule is to reject the null hypothesis if the F-statistic is less than 0.05 level of significance. Looking at the results in table 4.3, the probability value of all the F-statistic are greater than 0.05 level of significance. Therefore, we accept the null hypothesis and conclude that there is no causal relationship between Human capital and ICT on Health sector.

4.4. Presentation and Analysis of Ordinary Least Square (OLS) Regression Result.

4.4.1 Evaluation Based on Economic (A Prior) Criteria:

This section seeks to evaluate the regression result based on prior expectations. This evaluation is aimed at ascertaining if the time series data of the variables used conform to the agreement of the established economic theories.

TABLE 4.4.1 Regression Result (Dependent Variable=LNLEXP)

VARIABLE	COEFFICIENT	STD. ERROR	T-STATISTICS	PROB.
LNMCS	0.002548	0.000741	3.438389	0.0009
LNGEE	0.026718	0.001416	18.86182	0.0000
LNGDP	0.045886	0.011502	3.989324	0.0001
INFLA	0.000758	0.000149	5.070074	0.0000
C	3.185602	0.139429	22.84753	0.0000

R-SQUARE = 0.982524

R-SQUARE ADJUSTED = 0.981682

F-STATISTICS = 1166.578

PROB(F-STAT) = 0.000000

DURBIN WATSON STAT = 0.444295

Source: Authors Computation Using E-Views

Constant Term (C)

According to the regression result, the coefficient of the intercept 3.185602 shows that if other things remain the same (ceteris paribus), Health sector will continue to experience increase in Life expectancy by 3.2% annually.

Mobile Cellular Subscription (LNMCS)

The co-efficient of the log of Mobile Cellular Subscription output 0.002548 is positively related to Health sector in Nigeria. Thus, it shows that a percentage change in LNMCS will lead to a percentage increase in LNLEXP by 0.25units, holding other factors constant. This conforms to the apriori expectation which states that, Mobile cellular subscription is expected to have a positive impact on Life expectancy based on improved health care services. an increase in Mobile cellular subscription will lead to an increase in Health sector in Nigeria through channels like Telemedicine applications where patients can consult healthcare providers, receive diagnosis and access medical advice without needing to physically visit a healthcare facility, or the Mobile phones that allows individuals to access information easily through the internet, health applications or SMS.

Government Expenditure on Education (LNGEE)

The co-efficient of the log of GEE 0.026718 is positively related to the LNLEXP. It therefore shows that a percentage change in GEE will lead to a percentage increase in LNLEXP by 2.6units, holding other factors constant. This conform to the apriori expectation which states that, government expenditure on education is expected to have a positive impact on Life expectancy based on improved educational levels through Health awareness, education enhances knowledge about healthy lifestyles and healthy living leading to better health outcomes and increased life expectancy.

Gross Domestic Product (GDP)

The coefficient of the GDP which is 0.045886 is positive which shows that a unit change in GDP will lead to an increase in Health sector in Nigeria by 4.5 units, holding other factors constant. This conforms to the apriori expectation which states that an increase in GDP will lead to an increase in Health sector in Nigeria.With a higher level of GDP leading to more provision of social services, GDP is expected to have a positive impact on Life expectancy.

Inflation Rate (INFL)

The coefficient of inflation rate which is 0.000758 is positive which shows that a unit change in inflation rate increases health sector in Nigeria by 0.007 units, holding other factors constant. This does not conform to the apriori expectation which states that increase in inflation rate will lead to decrease in Health sector in Nigeria. While there may be some instances where inflation indirectly stimulates investments in the health sector or prompts efficiency improvements, the overall impact of inflation on the health sector tends to be negative, primarily due to the increased costs and financial pressures it imposes on healthcare systems, providers, and patients.

4.4.2: Error Correction Model (ECM) Regression

The error correction model (ECM) is used to correct for the short run disequilibrium among the variables so as to link the short run behavior of variables in the long run. Interest is on the error correction coefficient, which measures the speed of adjustment and corrects for disequilibrium in the model. The coefficient of the lagged error term [ECM (-1)] is therefore, expected to be negative and significant to adjust any disequilibrium encounter by the model in the short run.

Table 4.4.2: ECM Regression Result

Dependent variable: LNLEXP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000540	0.000235	2.299423	0.0241
D(LNMCS)	0.003448	0.001076	3.205536	0.0019
D(LNGDP)	0.038108	0.017795	2.141483	0.0352
D(LNGEE)	0.005876	0.002311	2.542691	0.0129
INFLA	0.000153	0.000140	1.087705	0.2800
ECM(-1)	-0.091674	0.049849	-1.839025	0.0696

Source: Author's Computation

According to table 4.3.2, the error correction term's lagged ECM (-1) coefficient is negative as expected (-0.091674), and it is statistically significant at the 5% level of significance. More specifically, within a year, approximately 9.2% of the difference between long-term and short-term LNLEXP will be corrected in the next period.

4.5 Evaluation of Research Hypothesis:

The research hypothesis of this study is evaluated in this section. As a reminder, our stated hypothesis in chapter one are:

H_{01}: There is no significant impact of human capital and ICT on Health sector.

H_{02}: There is no direction of causality between human capital development and ICT on Health sector

H_{03}: There is no long run relationship between Human capital development and ICT on Health sector.

Hypothesis 1:

From the regression result in table 4.4.1 Mobile cellular subscription (LNMCS) is statistically significant with a probability value of 0.0009. Based on this finding, we reject the null hypothesis and conclude that Mobile cellular subscription has a significant impact on the Health sector. Gross

domestic product (LNGDP) is statistically significant with a probability value of 0.0000. Based on this finding, we reject the null hypothesis and conclude that GDP has a significant impact on the Health sector.

Hypothesis 2:

The second hypothesis is evaluated using the results obtained from the granger causality test. The results show no causal relationship running from Mobile cellular subscription to Life expectancy because of the probability value of 0.6529, which is greater than 5% significance level. And also, no causality flowing from GDP to Life expectancy because the p-value of the null hypothesis is also greater than the 5% level of significance. We therefore fail to reject the null hypothesis and conclude that there is no causal relationship between ICT and Human capital on health sector.

Hypothesis 3:

From the result of the co-integration test carried out in table 4.2.2 it was observed that the co-integration result for Mobile cellular subscription, Gross domestic product, Government expenditure on Education and Inflation rate are co-integrated which shows a long run relationship. Therefore, we reject the null hypothesis which states that there is no long run relationship between Human capital development and ICT on Health sector and conclude that there exists a Long run relationship between the variables.

V. CONCLUSION AND POLICY RECOMMENDATIONS

This study examined the impact of ICT and Human capital development on the Health sector in Nigeria using Quarterly time series data from $2000Q_1$ to $2023Q_4$. The findings of this study provide valuable insights into the relationship between ICT and Human capital development on health sector. The results indicate that ICT and human capital development has a positive relationship and impact which conforms to the findings of previous studies. These findings underscore the importance of increased healthcare funding, strengthening primary healthcare, healthcare infrastructure development and health workforce development as a means to improve health sector in Nigeria. The study has shown also that lack of efficient health services, infrastructures and trained and skilled manpower would hinder the services of the Health sector in Nigeria. Mankiw, Romer and Weil (1992) and Barro (1991) and Oladeji, Abidemi, Omotayo (2015) in their research works also had similar results and findings. In summary, the health sector before the emergence of ICT and HCD initiatives was characterized by systemic challenges related to access, quality, efficiency, and equity. The integration of ICT and HCD has since offered opportunities to address these challenges, improve healthcare delivery, and enhance health outcomes for populations worldwide.

Arising from the foregoing some policy recommendations are inevitable. Firstly is the need to invest in upgrading and expanding ICT infrastructure, including internet connectivity and telecommunication networks, to ensure wider access to healthcare services, especially in remote and underserved area. These infrastructures allow healthcare providers to offer a broader range of services remotely, reaching individuals who may otherwise face barriers to accessing healthcare

due to geographic isolation or limited transportation options and to improve the efficiency of health data management, facilitate information sharing among healthcare providers, and enhance patient care coordination. Secondly, a robust ICT infrastructure facilitates the implementation of electronic health record (EHR) systems, enabling healthcare providers to digitize patient records and streamline data management processes. This also involves developing and implementing health information systems that leverage ICT to collect, analyze, and disseminate health data for evidence-based decision-making and policy formulation. Data analytics and machine learning techniques helps to identify trends, patterns, and potential health risks, thereby enabling proactive interventions and resource allocation. This not only improves the efficiency of healthcare delivery but also enhances the accuracy and accessibility of patient information, leading to better-informed clinical decisions. Thirdly, is the imperative of investing in HCD through training programs and capacity-building initiatives for healthcare professionals, focusing on ICT literacy, digital skills, and best practices in utilizing technology for healthcare delivery. This is very essential for ensuring that they have the skills and knowledge necessary to leverage ICT effectively in healthcare delivery. The Government can achieve this through Collaborating with private sector entities, such as technology companies and educational institutions, can expand the resources available for human capital development in healthcare. They can also subsidize training programs for healthcare professionals, making them more accessible and affordable. This could involve offering scholarships, grants, or subsidies to cover tuition fees, training materials, and other associated costs, particularly for professionals working in underserved areas. Lastly, the Government should create a policy that Fosters interdisciplinary collaboration between healthcare providers, ICT specialists, and policymakers to facilitate knowledge exchange and skill development in leveraging ICT for healthcare improvement.

REFERENCES

Ahmad, N. S., Makmor-Bakry, M., & Hatah, E. (2020). Multi stakeholders of health and industries perspectives on medicine price transparency initiative in private health care settings in Malaysia. Saudi Pharmaceutical Journal, 28(7), 850-858. https://doi.org/10.1016/j.jsps.2020.06.003

Audrey, L. (2014). Should the Grossman model retain its iconic status in Health Economics? Canadian centre for Health Economics, working paper No.2014 – 04, February, 2014

Akpolat, A. G. (2014). The Long-Term Impact of Human Capital Investment on GDP : A Panel Cointegrated Regression Analysis. Economics Research International, 220–222. https://doi.org/10.1155/2014/646518

Amadu, I., Eseokwea, N. F., & Ngambi, M. (2017). Contribution of Public Health Investments to the Economic Growth of Cameroon. Business and Economics Journal, 6(4), 1–9. https://doi.org/10.4172/2151-6219.1000189

Anton, S. G., & Onofrei, M. (2012). Health care performance and health financing systems in countries from Central and Eastern Europe. Transylvanian Review of Administrative Sciences, (35), 22–32.

Asiskovitch, S. (2010). Gender and health outcomes: The impact of healthcare systems and their financing on life expectancies of women and men. Social Science and Medicine, 70(6), 886–895. https://doi.org/10.1016/ j.socscimed.2009.11.018

Adele, G.N. & Ibietan, J. (2017). Manpower Training and Productivity in Nigerian Public Sector: An Appraisal and Human Capital Discourse. International Journal of Innovative Development & Policy Studies. 5(3): 1-15

Alika, I.J., & Aibieyi, S. (2014). Human capital: Definitions, approaches and management dynamics. Journal of Business Administration and Education, 5(1), 55-78.

Amuta, E.U., Tsaku Isaac, M., & Akyala, I. (2013). A Retrospective Study on the Epidemiological Trend of Human Immunodeficiency Virus (HIV) and Pulmonary Tuberculosis (PTB) Co-Infection in Nasarawa State,Nigeria. Journal of Natural Sciences Research, 3, 45-51.

A. Bhargava et al (2001). Modeling the effects of health on economic growth Journal of Health Economics

Adebayo B. (2018) Nigeria overtakes India in extreme poverty ranking [Online]. https://edition.cnn.com/2018/06/26/africa/nigeria-overtakesindiaextreme-poverty-intl/index.html 21.12.2018

Adekoya O. D. (2018) Impact of Human Capital Development on Poverty Alleviation in Nigeria. International Journal of Economics & Management Sciences, DOI: 10.4172/2162-6359.100054410.4172/2162-6359.1000544

Adeyemi, P.A & Ogunsola A.J (2016). The Impact of Human Capital Development on Economic Growthin Nigeria: ARDL Approach. IOSR Journal of Humanities and Social Science. Vol. 21 (3).

Ajadi O.T & Adebakin A.B (2014). Human Capital Development as correlate of Economic Growth In Nigeria. The African Symposium:An Online Journal of the African Educational Research Network. Volume 14, Nos. 1 & 2. Pp 133 -139

Borojo, D. G., & Jiang, Y. (2016). The Impact of Africa-China Trade Openness on Technology Transfer and Economic Growth for Africa: A Dynamic Panel Data Approach. Annals of Economics & Finance, 17(2).

Babatunde M. A. and Adefabi R. A. (2005). Long-run relationship between education and economic growth in Nigeria evidence from Johansson Cointegration Approach. Paper presented at Regional Conference on Education in West Africa: Constraints and Opportunities Dakar Senegal November 1st - 2 nd, Conned University/ CREA Ministerede !' Education du \senegal.

Baldacci, E., Clements, B., Gupta, S., & Cui, Q. (2008). Social Spending, Human Capital, and Growth in Developing Countries. World Development, 36(8), 1317–1341. https://doi.org/10.1016/j.worlddev.2007.08.003

Abomeh, O.S., & Peace, N.N. (2015). Effects of training on employees' productivity in Nigeria insurance industry. Journal of Economics, Management and Trade, 227-235.

Benhabib et al (1994). The role of human capital in economic development: Evidence from aggregate cross-country data Journal of Monetary Economics

Braa, J. & Nermunkh C. (2000). Health Information System in Mongolia: a difficult process of change. In C. Avgeuru & G. Walsham (Eds.), Information Technology in Context, perspectives from developing countries, UK: Ashgate.

Bjørn-Andersen, N., Mohan, L. and Belardo, S. (1990) A Contingency Approach to Managing Information Technology in Developing Nations: Benefiting from Lessons Learned in Developed Nations, in: Bhatnagar, S.C. and Bjørn-Andersen, N. (Eds.) Information Technology in Developing Countries, 15–22, North-Holland: Elsevier Science Publishers B.V. and IFIP.

Boehning, F. (2002) Some of the Errors/Mistakes of the MTUHA Version 2.2 of 19/6/2001. Unpublished report: Tanga Regional Medical Office, Tanzania.

Boerma, J.T. (1991) Health Information for Primary Health Care, in: Editor, X.Y. (Ed.) Health Information for Primary Health Care, 1-176, African Medical and Research foundation.

Braa, J. and Blobel, B. (2003) Strategies for Developing Health Information Systems in Developing Countries, in: Khakhar, D. (Ed.) WITFOR 2003 WhiteBook, 175-219, Luxemburg: IFIP Press.

Braa, J. and Hedberg, C. (2002) The Struggle for District-Based Health Information Systems in South Africa, Information Society, 18, 2, 113-127.

Braa, J., Monteiro, E. and Reinert, E. (1995) Technology Transfer Versus Technological Learning: IT Infrastructure and Health in Developing Countries, Information Technology for Development, 6, 1, 15-23.

Braa, J., Monteiro, E. and Sahay, S. (2004) Networks of Action: Sustainable Health Information Systems Across Developing Countries, MIS Quarterly, 28, 3, 337-362.

Cesarini, P. (2004) Computers, Technology and Literacies, Journal of Literacy and Technology, V. 4.

Ehimare, O A, Ogaga-Oghene, J O, Obarisiagbon, E I & Okorie E U (2014). The Nigerian Government Expenditure on Human Capital Development: An Efficiency Analysis. European Journal of Business and Social Sciences, Vol. 3 (7): 1 –13

Fatu Y. Retention of Health Care Workers in LowResource Settings: Challenges and Responses. Intra Health International Technical Brief. 2006 Feb.

Huddart J, Picazo O. The health sector human resource crisis in Africa: an issues paper. SARA Project, AED; USAID; 2003.

Jensen, M. (1998). Africa Internet Connectivity: Information and Communication technologies

Khatun, Fatema and Khanam Sima, Mst. Rokshana (2015) Impact of ICT on Health Services in Bangladesh: A Study on Hobiganj Adhunik Zila Sadar Hospital (April 6, 2015). Available at SSRN: https://ssrn.com/abstract=2591201 or http://dx.doi.org/10.2139/ssrn.2591201

Obi, Z. C.& Obi, C. O. (2014). Impact of Government Expenditure on Education: The Nigerian Experience. International Journal of Business and Finance Management Research, 2(2104), 42-48.

Oladeji, A. O. (2015). Impact of Human Capital Development on Economic Growth in Nigeria. International Journal of Recent Research in Commerce Economics and Management.2(2) 151-164.

Olalekan O. (2014). Human Capital and Economic Growth in Nigeria. International Journal of Innovation and Scientific Research, vol. 11, no. 2, pp. 291–294.

PANIR, M. J. H. (2011). Role of ICTs in the Health Sector in Developing Countries: A Critical Review of Literature. *Journal of Health Informatics in Developing Countries,*

Ragan, C.&Lipsey, R.G. (2005). Economics, Eleventh Canadian Edition. Instructor's Resource

CD-ROM. Pearson Education Canada.Schultz,T.W.(1993). The Economic Importance of Human Capital in Modernization. Education Economics,1(1),13-19.

Sulaiman, C., Bala, U., Tijani, B. A., Waziri, S. I., & Maji, I. K. (2015). Human Capital, Technology, and Economic Growth: Evidence From Nigeria.

Todaro, M., & Smith, S. C. (2011). Economic Development (11thEdition). Addison-Wesley: London.

Tulchinski T, Varavikova EA. The new public health. 3rd ed. San Diego: Elsevier Academic Press; 2014. p. 884. [Google Scholar]

United Nations Development Programme. (2000). World Development Report. Retrieved from http://www.undp.org/hdr200/english/HDR2000.html

World Health Organization. About World Health Organization. Constitution. Available at: http://www.who.int/governance/eb/constitution/en/. Accessed: December 27, 2017.

World Health Organization. World Health Report Executive Summary - achieving health for all. Available at: http://www.who.int/whr/1998/media_centre/executive_summary6/en/. Accessed: December 27, 2017.