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HUMAN CAPITAL DEVELOPMENT AND UTILIZATION: THE PANACEAS FOR INDUSTRIAL DEVELOPMENT IN NIGERIA

Rasaki Stephen Dauda*
Department of Economics, Redeemer's University, Ede, Osun State, Nigeria

*Corresponding author's email: daudas@run.edu.ng

Abstract

Industrialization is considered central to advancement and prosperity of every nation. It has been one of the key explanations for the lofty progress attained by most advanced economies of the world. This however, was not accidental; rather it was due to conscious and deliberate policy enactment and implementation. This study examines the critical role of human capital formation and utilization in industrial development in Nigeria. It focuses on three fundamental human capital development processes (education, health and migration), based on human capital theory, using the methodology, which involves stylized facts, descriptive statistics and review of related literatures. The findings suggest that the performance of Nigeria in various indicators of human capital development and utilization falls short of what is required for industrial development. It is therefore imperative to enact precise human capital development and utilization policies, which should be vigorously pursued and implemented within specific time frame to enhance industrial development of the country.

Keywords: Industrialization, Utilization, Education, Health, Migration, Nigeria.

JEL Classification: E24, I15, O14, O15

Introduction

Industrialisation is considered very critical for advancement and prosperity of every nation. Commenting on the strategic importance of the industrial sector for development, the then Nigeria's Minister of Industry, Trade, and Investment, Olusegun Aganga reiterated that no country can ever be rich based on the exportation of raw materials without the industrial and services sectors (Federal Ministry of Industry, Trade, and Investment, FMITI, 2014). According to European Commission (2006), several social objectives that are considered important for development such as employment generation, poverty alleviation, gender equality, and greater access to education and healthcare can easily be achieved through industrialisation. The economic advancement attained by developed countries, and the growth miracles and economic transformation experienced by the four Asian Tigers were not without the influence of industrial development (see Tan 1997; Gyang, 2011; Kniivilä, 2007; and Imhonopi & Urim, 2014).

Realizing this, African countries after political independence aggressively embarked on policies aimed at transforming their primary product dominated (mostly agriculture) economies to industrialized ones (see United Nations, 2011; and Isiksal & Chimezie, 2016). The motivation for this was based on the conviction that industrialization "was necessary to ensure self-reliance and reduce dependence on advanced countries" and thereby "hasten the transformation of African countries from agricultural to modern economies, create employment opportunities, raise incomes as well as living standards, and reduce vulnerability to terms of trade shocks resulting from dependence on primary commodity exports" (United Nations, 2011, P.2).

Countries in the continent in recent times appear to be showing renewed commitment to industrial development "as part of a broader agenda to diversify their economies, build resilience to shocks, and develop productive capacity for high and sustained economic growth", create employment opportunities, and alleviate poverty (United Nations, 2011, P.2). Beginning from the early 1960s, Nigeria factored industrialization policies into her different development plans. Chete et al (2014) chronicle these from the

first development plan of 1962-1968 (in which the country adopted import-substituting industrialization policy) to the second plan of 1970-1974, where Nigeria decided to upgrade local production of intermediate and capital goods for sales to other industries. The remaining plans, 1975-1980, 1981-1985, as well as the structural adjustment programme (SAP) of 1986, the national science and technology policy launched in 1986, the trade and financial liberalization policy of 1989, the National Economic Reconstruction Fund (NERFUND) of the same year, the National Economic Empowerment and Development Strategy (NEEDS), the establishment of Bank of Industry (BOI) in 2000, and other programmes, have embedded in them policies aimed at industrialization. In spite of these efforts, Nigeria is yet to industrialize.

In 2014, the federal government launched a 5-year Industrial Revolution Plan (NIRP), which aimed at accelerating and building industrial capacity of the country to raise the contribution of the manufacturing sector to Gross Domestic Product (GDP) (FMITI, 2014). Similarly, on 5th April, 2017 the nation launched the 2017-2020 economic recovery and growth plan (ERGP) in which the broad objective of the 2014 NIRP was incorporated (Federal Republic of Nigeria, 2017, P.58). The objective according to the plan would be achieved through development of four industry groups (agri-business and agro-allied; solid minerals and metals; oil and gas related industries; and construction, light manufacturing and services) where the country appears to enjoy some form of comparative advantage. This is a welcome development and the government's effort in this direction is highly commendable. The reason being that if the plans are well implemented, they will launch the country on the path of industrial development, particularly as the oil sector appears to be losing its relevance due to efforts of several economies to develop alternative sources of energy. However, greater attention should be given to robust human capital development and utilization programmes among the strategies aimed at achieving the specific objectives. Similarly, it is essential that resources are provided to ensure proper implementation of the objectives set out in these documents.

In fact, Nigeria cannot continue to wish industrialization; rather she must consciously plan and execute industrial development policies within specific time frame; which must give high priority to human capital development and utilization. Currently, her performance in human capital development and utilization activities is very poor, given low literacy rate, school enrolments, life expectancy, health expenditure, physicians density; and high infant mortality, maternal mortality and degree of risk of major infectious diseases (World Factbook, 2020). Similarly, human capital utilization, which manifests in employment/unemployment rates, brain drain and net migration continues to degenerate (see Aiyedogbon & Ohwofasa, 2012; Dauda, 2017; and National Bureau of Statistics, NBS, 2018). All these have negative implication for industrialization in the country. Thus, industrial development will remain an illusion in any society that neglects human capital development and utilization. It is therefore, essential to assess the progress attained by Nigeria in development and utilization of her human resource stock as the quest to industrialize the country continues.

This study therefore examines the critical role of human capital development and utilization in industrial development in Nigeria with focus on education, health and migration. Available studies on human capital and industrial development in Nigeria such as Olayemi (2012), Adejumo, Olomola and Adejumo (2013), Imhonopi and Urim (2014), Udah and Ebi (2017), Okumoko, Omeje and Udoh (2018), Obikwelu (2018), and Uzochukwu, Matthew and Olohi (2020) focus strictly on how human capital development influence industrialization with emphasis on either school enrolment or expenditure on health and education. This paper diverges substantially from others in that it examines how both human capital development and utilization affect industrialization in Nigeria. None of the existing works has been able to capture human capital utilization as important for industrialization. Moreover, the current study does not limit itself to education and health as human capital measures, but also covers migration and brain drain. These are the vital gaps the study fills. The remainder of the paper is structured thus: section 2 dwells on background of the study, which covers indicators of human capital development and utilization as they affect industrial development in Nigeria relative to other countries in Africa and beyond. Section 3 reviews literature with focus on the role of human capital development and utilization in industrial development; section 4 assesses industrial development situation in Nigeria and selected nations across the globe while section 5 summarizes and concludes the study.

Background of Study: Human Capital Development and Utilization for Industrialization. How Far Has Nigeria Gone?

Human capital development in Nigeria

Literature identifies specific measures of human capital to include formally organized education at the elementary, secondary and higher levels; investment in health facilities and services; on the-job training, including old-typed apprenticeships organized by firms; study programmes for adults that are organized by firms; and migration of individuals and families to adjust to changing job opportunities (Schultz 1961). Three of these measures- education, health and migration- are examined in this section. These are the major human capital measures, which are key to industrial development. Moreover, data are readily available on them.

Human capital development in the area of education

Education is critical for industrial advancement, economic growth and development, poverty alleviation, improved level of living, sustainable development and reduction in inequality (Barro, 2000; Wei & Hao, 2011; African Development Bank, AfDB, Organisation for Economic Co-operation and Development, OECD & United Nations Development Programme, UNDP, 2017; Liao, Du, Wang & Yu, 2019; and World Bank, 2019). This explains why nations of the world continue to invest rigorously in education.

The progress made by Nigeria in the area of educational investment falls short of what is required for industrial development. As evident in Table 1, the highest budgetary allocation to education, 13.19% occurred in 2002 while the least, 4.09% went to the sector in 2009. The allocation, which was 7.05% in 2019, fell to 6.90% in 2020. The figures fall short of the 26% benchmark UNESCO'S recommendation for developing countries and what obtains in several African countries (see Federal Republic of Nigeria 2001; Azi 2011; Igbuzor, 2019). This does not portend a good omen for a country that wishes to industrialize.

Table 1: Percentage of Total Budget Allocation to Education Sector in Nigeria, 1999-2020

Year	Education Budget (%)
1999	13.14
2000	12.24
2002	13.19
2003	7.28
2004	8.56
2005	8.56
2007	10.34
2008	10.07
2009	4.09
2010	6.95
2012	8.43
2017	6.00
2018	7.04
2019	7.05
2020	6.90

Source: Nwagwu (2014), Oyedeji (2016), Olaniyi (2017), Igbuzor (2019); Aworinde (2019).

Another indicator of education is school enrolment. Out of the three (primary, secondary and tertiary) presented in this study (see Table 2), the performance of Nigeria appears to be encouraging in school enrolment at the primary school level relative to the other two. This nevertheless, was a far cry from the height attained by all the countries presented in the table.

Regarding secondary and tertiary school enrolments, two issues are evident. Firstly, the figures are very low; and secondly, the trend declines and fluctuates, compare to very high and rising figures in other nations. A low enrolment at the secondary school could mean increase in dropout rate at the primary level and declines in progression from primary to secondary school in the country. These could further reduce enrolment for tertiary education and invariable impact negatively on research and development as well as industrialization.

Tertiary education is necessary for industrialization. While the importance of basic education cannot be downplayed, it does not engender industrial development. Tertiary education, which encourages and contributes more to research and development, has the wherewithal to bring about industrialization. Nigeria's tertiary education system is bedevilled with several challenges such as strikes; inadequate funding; insufficient, poor and deteriorating infrastructure; obsolete laboratory equipment for teaching, research and learning; shortage of students' hostels, office spaces, lecture halls, library space, books and journals; brain drain; among others (see Ajayi & Ekundayo, 2007; Dimunah, 2017; Omodan, Dube & Tsotetsi, 2018). These affect Nigeria's education system performance compared to some African and advanced countries. A poor educational system will serve as a drag on industrialization. Nigeria must encourage and invest heavily in tertiary education, which is a critical dimension of human capital development and fundamental to harnessing the demographic dividend and boosting industrialization (AfDB, OECD & UNDP, 2017). In addition, greater proportion of Nigeria's population is illiterate. The Minister of Education in Nigeria, Adamu Adamu revealed that between 65 and 75 million Nigerians are illiterate (Idoko, 2017) while the literacy rate as at 2018 was 62% (World FactBook, 2020).

Table 2: School Enrolment Ratio (Primary, Secondary and Tertiary) in Percentage, 1990-2019

	1990			2000			2010			2019		
Country	PRY	SEC	TER	PRY	SEC	TER	PRY	SEC	TER	PRY	SEC	TER
Nigeria	86.4	24.7	Na	98.6	24.6	Na	85.1	44.2	9.6	84.7a	42.0a	na
Benin	51.3	na	2.2	82.5	21.8	3.7	120.2	Na	13.8	116.7	59.0a	12.5c
Sweden	99.5	89.7	30.7	109.6	151.9	67.1	101.4	98.1	73.7	128.6c	151.7c	72.5c
Algeria	92.1	59.1	10.3	104.9	64.7	na	115.2	97.0	29.8	107.3	na	51.4c
Tunisia	114.3	44.9	8.1	114.9	74.6	19.2	107.2	90.4	35.2	115.5c	92.9a	31.9
Morocco	67.3	37.3	10.3	92.5	38.6	10.2	109.6	63.2	14.5	114.8	81.2	38.6
Ghana	71.6	36.0	Na	86.2	35.7	na	na	Na	na	104.8	74.7	17.2
Canada	103.7	99.2	90.0	100.3	101.4	na	98.6	102.3	na	101.5c	114.1c	70.1c
SA	103.3	65.0	12.0	103.9	82.6	na	97.9	92.0	na	98.5	100.5c	23.8c
UK	106.8	84.3	26.5	100.3	101.8	58.5	104.8	103.1	59.2	101.0c	120.8c	61.4c
US	105.8	91.3	71.1	100.5	94.0	na	99.6	93.0	na	101.3c	99.3c	88.3c
CV	124.8	20.8	Na	120.7	67.9	2.0	102.6	86.6	17.9	104.0c	88.2c	23.6c
Uganda	70.4	11.4	1.2	130.0	na	2.6	116.8	Na	3.9	102.7b	na	na
Tanzania	69.6	na	Na	67.5	na	0.7	97.4	30.6	2.1	98.8	32.0	3.1

a = 2016 values, b = 2017 value, c = 2018 value, PRY= Primary Education, SEC = Secondary Education, and TER = Tertiary Education; SA= South Africa; CV = Cape Verde; UK = United Kingdom; US = United States
Source: World Bank (2020).

Research and development

Research and development (R&D) promotes science and technology, which are critical and highly strategic for industrial development. According to Kniivilä (2007, P.296), R&D "activities are the main drivers of technological change in developed countries." Kim and Mah (2009, P.262) report that R&D contributed tremendously to the growth and development of technology-intensive industries in China due to different R&D policies embarked on by the country; such as increased funding for R&D, encouragement of foreign direct inflows to introduce advanced technology while promoting and nurturing indigenous technologies, provision of systematic guidelines and establishment of economic technology development and high technology industrial development zones, and development of human resources in science and technology.

Nigeria since colonial days recognizes the importance of R&D. According to NBS (na), R&D existed as departments headed by scientists and engineers under different ministries when they were established in the 1940s, with about 14 of them existing within the Ministry of Agriculture and Water Resources alone in the 1960s. However, their activities were not coordinated, and so all of them operated independently from one another until 1970 when the Nigerian Council for Science and Technology (NCST) was established, with the responsibility of "ordering national priorities in scientific research and coordinating and supervising both basic and applied research activities in the country." Thereafter, four different subsidiary councils were established to assist NCST in specific areas of operation (Agricultural Research Council and the Industrial Research Council founded in 1971; and the Medical Research Council and the

Natural Science Research Council of Nigeria launched in 1972 and 1973 respectively). Nonetheless, these efforts have not led to industrialization of the country. Part of the major problems facing R&D in Nigeria is funding. Unlike advanced economies, Nigeria has not been committing substantial funds to research, which is one of the banes of industrial development. Similarly, the number of researchers and technicians in the country is abysmally low.

The Director General of the Federal Institute of Industrial Research, Oshodi (FIIRO), Nigeria, as cited in Obuh (2014) reiterates that Nigeria's investment in R&D was just 0.01% of global expenditure. Available information shows that the country spent only 0.13% of her GDP on R&D in 2007 compared to 0.88%, 2.34%, 2.63%, 3.00%, 3.26%, 3.46%, and 4.41% by South Africa, Singapore, US, South Korea, Sweden, Japan and Israel respectively (World Bank, 2020). Moreover, Researchers in R&D per million people in Nigeria same year stood at 38.79 as against 5768.57, 5377.69, 5004.96, and 388.79 in Singapore, Japan, Sweden, and South Africa in that order while her Technicians in R&D per million people remained 12.57 compared to 500.79, 589.54, 1950.00 and 121.96 in Singapore, Japan, Sweden, and South Africa respectively (World Bank, 2020).

Human capital development in the area of health

Health is one of the crucial human capital measures, which has contributed immensely to development process as acknowledged in the literature (see Bhargava et al 2001; Acemoglu, Johnson & Robinson, 2003; Weil, 2007; AfDB, OECD & UNDP, 2017; and World Bank, 2019). It is important for higher productivity and better performance of society. According to AfDB, OECD and UNDP (2017, PP.100-101) "investment in health and education improves the productivity of the labour force, including its capacity for innovation," and "healthier and better educated workers are more likely to participate in opportunities created by economic growth." This explains why several economies across the globe invest vigorously in health facilities and health care services, with greater proportion of their budgets allocated to the health sector. However, the case of Nigeria appears different as her budgetary allocation to the health sector over the years has been very low (4.50% in 2020, which has further been reduced substantially in the revised budget due to COVID-19) and in most cases declining as apparent in Table 3, falling short of the 15% African Union's recommendation (see Federal Republic of Nigeria 2001; Azi, 2011). This is not healthy for industrial development.

Table 3: Percentage of Total Budget Allocation to Health Sector in Nigeria, 1999-2020

Year	Health Budget (%)
1999	10.29
2000	6.15
2003	4.71
2004	5.50
2005	6.99
2009	6.98
2010	5.49
2012	5.95
2017	4.15
2018	4.00
2019	4.10
2020	4.50

Source: Nwagwu (2014), Oyedeji (2016), BudgIT (2018), Adekoya, Muanya, Nelson, Ibirogba & Okwe(2018); and Aworinde (2019).

Better investment in health sector manifests in health outcomes, which are measured in different ways. Three of these (average life expectancy at birth, infant mortality and under-five mortality) are considered in this study as presented in Table 4.

Table 4. Life Expectancy, Infant and Under Five Mortality Rates, 1990-2019

	1990			2000			2010			2019		
Country	LEP	IFM	UFM	LEP	IFM	UFM	LEP	IFM	UFM	LEP*	IFM	UFM
Nigeria	45.9	125.1	210.9	46.3	110.9	184.8	50.9	84.1	135.2	54.3	74.2	117.2
Benin	53.8	105.8	175.4	55.4	86.4	139.3	59.3	70.8	111.1	61.5	59.0	90.3
Sweden	77.5	5.9	7.0	79.6	3.4	4.1	81.5	2.5	3.1	82.6	2.1	2.6
Algeria	66.9	41.8	49.5	70.6	33.9	39.7	74.9	23.5	27.4	76.7	20.0	23.3
Tunisia	68.8	43.3	55.5	73.2	25.0	30.0	75.0	15.8	18.4	76.5	14.5	16.9
Morocco	64.7	62.5	79.1	68.7	41.7	49.4	74.4	27.5	32.1	76.5	18.3	21.4
Ghana	56.8	79.8	127.4	57.0	64.2	99.5	61.0	47.5	69.9	63.8	33.9	46.2
Canada	77.4	6.8	8.3	79.1	5.3	6.2	81.3	4.9	5.6	82.0	4.2	4.9
SA	63.3	45.8	59.2	56.1	49	73.9	57.7	38.2	52.5	63.9	27.5	34.5
UK	75.9	7.9	9.3	77.7	5.6	6.5	80.4	4.4	5.2	81.3	3.7	4.3
US	75.2	9.4	11.2	76.6	7.1	8.4	78.5	6.2	7.3	78.5	5.6	6.5
CV	64.7	46.8	60.7	68.6	29.2	35.6	71.1	21.1	24.9	72.8	12.8	14.9
Uganda	45.9	108.6	184.7	46.2	88.4	147.8	57.1	50.2	77.4	63.0	33.4	45.8
Tanzania	50.2	100.5	166.1	50.8	79.4	130.0	58.6	47.5	72.3	65.0	36.0	50.3

LEP= Life expectancy; IFM = Infant mortality; UFM = Under-five mortality; SA= South Africa; CV = Cape Verde; UK = United Kingdom; US = United States. * Data for 2018.
Source: Compiled by Author from World Bank (2020).

Low infant and under-five mortality rates, as well as high average life expectancy are reflection of better health sector performance. Although Nigeria has recorded some improvements with respect to the performances of these variables, a lot still needs to be done; particularly when we compare the height attained by several countries across the globe. In several countries, average life expectancy is well above 70 years, with some countries recording 80 years and above. As evident in Table 4, average life expectancy in Nigeria stood at approximately 54.3 years in 2018. Whereas, in countries such as, Canada and Sweden, life expectancy same year remained 82.0 and 82.6 years respectively. In some West African countries like Benin, Ghana and Cape Verde, average life expectancy as at 2018 remained 61.5, 63.8 and 72.8 in that order. Similarly, infant and under-five mortality rates have reduced to a single digit in many counties as against double and triple digits in Nigeria. All these reflect poor state of health in the country, which calls for investment in the sector, without which industrial development will remain an impossible task.

Furthermore, the poor performance of Nigeria in human capital development is evident in low rate of human capital index presented in Table 5 compared to other nations within and outside Africa.

Table 5: Human Capital Index (HCI)

Country	2010	2017	2018	2020
Nigeria	NA	0.342	0.355	0.361
Benin	0.366	0.406	0.397	0.400
Canada	0.774	0.799	0.800	0.798
Cape Verde	NA	NA	NA	NA
Algeria	0.531	0.523	0.532	0.535
United Kingdom	0.766	0.781	0.777	0.783
Ghana	NA	0.439	0.444	0.450
Morocco	0.474	0.500	0.493	0.504
Sweden	0.762	0.800	0.803	0.795
Tunisia	0.525	0.508	0.510	0.517
Tanzania	NA	0.400	0.386	0.390
Uganda	0.344	0.382	0.382	0.384
United States	0.692	0.762	0.714	0.702
South Africa	0.425	0.406	0.423	0.425

Source: World Bank (2020)

From Table 5, the human capital index of Nigeria over the years has remained below average and far behind most countries in Africa and beyond. Although there has been marginal improvement in her performance since 2017, the index is very low. In 2017, the nation recorded 0.342 (34.2%), which rose to 0.355 (35.5%), and currently stands at 0.361 (36.1%). Going by the sampled countries presented in the table, African countries like Benin, Algeria, Ghana, Morocco, Tunisia Tanzania, Uganda and South Africa, are ahead of Nigeria. In fact, Algeria, Morocco, and Tunisia are above average with respect to their performance in the index. Other countries such as Canada, United Kingdom, Sweden and United States scored above 70%. It is important that Nigeria begins to invest rigorously in human capital development activities to propel industrial development in the country.

Human capital utilization in Nigeria

In relative terms, the performance of Nigeria in human capital development looks better compare to human capital utilization. The primary objective of human capital development is "effective utilization of scarce or abundant talent in the interest of both broad and specific national objectives as well as the objectives of industry, business and individual employee" (Abdullah 1990, P.91). It is not enough to develop human capital; concrete and specific plans must be formulated for optimum utilization if Nigeria will industrialize. In any country where human capital is not properly used, unemployment rate is always high, particularly among the highly skilled, educated and professionals. Moreover, net migration in such society remains very low or even positive while brain drain will be on the increase.

Table 6: Unemployment Rate, Nigeria 1990-2018

Year	Unemployment Rate (%) New and Old[1]	
	Old	New
1990	3.5	-
1995	1.8	-
2000	13.6	-
2005	11.9	-
2010	21.4	5.1
2011	23.9	6.0
2012	27.4	10.6
2013	24.7	10.0
2014	25.1	6.4
2015	27.3	10.4
2016	33.6	14.2
2017	40.9	20.4
2018	43.3	23.1
2020 (Q2)	55.7	27.1

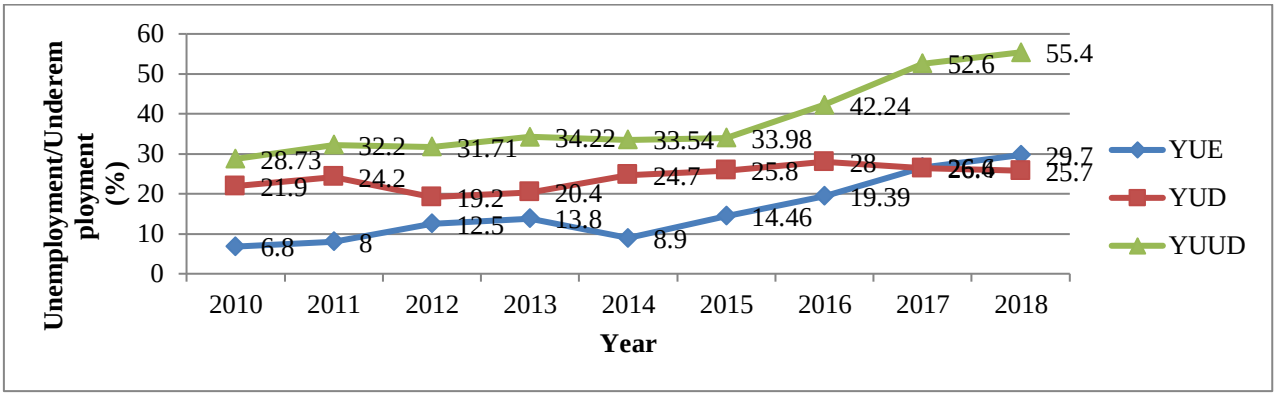
Source: NBS (2014, 2016, 2017, 2018, 2020).

The state of human capital utilization in Nigeria is not favourable as shown in the high rate and rising trend of unemployment presented in Table 6 and increasing trend of youth unemployment and underemployment indicated in Figure 1.[2] These suggest wastage of skills and capabilities of this crop of persons, with their contributions to national productivity nearing zero, which is not healthy for the nation's quest to industrialize. In fact, studies have reported jobless growth situation in Nigeria over the years, indicating failure of economic growth to generate employment (Oloni, 2013; Ajakaiye *et al*., 2016; and Dauda, 2020a), which is not healthy for industrial development.

[1] Until 2014, a person who falls within the labour force (age bracket 15–64 years) was said to be unemployed if he/she in the last one week was available for work, has been actively seeking for work but was unable to secure one for 40 hours; however, beginning from 2014 till date such a person must be available within the last seven days, looking for work and not able to get for 20 hours (see NBS, 2014 & 2016).

[2]Underemployment has to do with persons who are "working but doing menial jobs not commensurate with their qualifications or those not engaged in fulltime work and merely working for few hours" (NBS, 2016, p. 8).

Furthermore, unemployment among graduates (BA/BSc/Bed/HND holders) in the country is high, declining slightly from 31.8% in 2017 to 29.8% in 2018 before rising to 40.9% in 2020 while combined unemployment and underemployment among them stood at 50.0% in the third quarter of 2017(NBS, 2017, 2018 & 2020).



Where YUE stands for Youth unemployment; YUD means Youth underemployment and YUUD implies both Youth unemployment and underemployment

Figure 1: Youth Unemployment and Underemployment Rates in Nigeria (New), 2010-2018

Source: Generated by the Author from NBS (2016 and 2018).

Migration and brain drain

Migration is another means through which human capital can be gained and developed. Some economies employ this policy to prevent population ageing. This helps to woo young and vibrant youths who can contribute meaningfully to the growth and development of such countries from other nations of the world. The rate at which young people migrate out of Nigeria has been rising. The situation appears to be worsening in recent times with professionals, highly skilled individuals and non-professionals fleeing the country for greener pastures. International Organization for Migration (2016) reported that between 1990 and 2013, the number of Nigerians who were living outside the country was more than double, with about 61.4% of them living in developed countries of Europe (United Kingdom, Italy, Spain, Germany and Ireland) and North America (United States).

Human capital utilization can also reflect in brain drain. Although statistics on brain drain in Nigeria is scanty, there is a general consensus that a large number of highly skilled and educated Nigerian professionals trained within and outside the country are practising abroad (see Nwozor, 2011; Dauda, 2020b). Leaders of Nigerians in Diaspora Organisation (NIDO) as reported by Abuh (2017) revealed that over 17 million Nigerians are spread across different countries in the world, with greater percentage of them being highly skilled and educated professionals. According to Nwozor (2011) around 2,855 Nigerian doctors were registered with the American Medical Association in 2003 alone while 2,341; 2,985; and 3,567 requested for Certificate of Good Standing (CGS) in different countries of the world in 2005, 2006 and 2007 respectively. About 5,517 nurses, who were trained in Nigeria sought employment outside the country while approximately 5,695; 1,977, and 3,194 did the same in 2005, 2006 and 2007 in that order. Dauda (2018) who cited Zong and Batalova (2017) reported that Nigeria alone accounts for about 42.30% of West African migrants living in the United States in 2015. Nigeria has lost quite a number of her professionals and highly skilled individuals (who could have contributed positively to industrial development) such as medical practitioners, university lecturers, engineers, paramedical personnel, scientists, technologists, etc. to South Africa and the continents of Europe and North America (see Leo & Okafor, 2013; Benedict & Ukpere, 2012; Aremu, 2015; Adebayo, 2011; Adeyemi, 2017).

Among the major push factors responsible for high rate of emigration of skilled work force out of Nigeria, especially to advanced economies is unemployment, which can be referred to as underutilization of human capital. International Organization for Migration (2016) revealed that unemployment has been one of the

major causes of increasing migration of Nigerians to more developed regions of the world. The nation needs to retain her skilled labour in particular to enhance industrial development of her economy.

Literature Review

Industrial development: The role of human capital development and utilization

Literature ascribes greater role to human capital in growth, development and industrial advancement (Lucas, 1988; McDonald & Roberts, 2002; Wei & Hao, 2011; Ali, Egbetokun & Memon, 2018; World Bank, 2018 & 2019; and Soyer, Ozgit & Rjoub, 2020). The industrial revolution, of which the contribution of human capital was initially downplayed, has now been acknowledged as having human capital played significant role (see Mokyr, 2005; Mokyr & Voth, 2009; Squicciarini & Voigtländer, 2015; and Blum & Colvin, 2018). Recent studies have reported the significance of the inventiveness and high skill of very minute highly educated individuals such as "scientifically savvy engineers and entrepreneurs at the top of the skill distribution" in the revolution (Squicciarini & Voigtländer, 2015). Moreover, the "growth of tangible capital stock of a nation depends to a considerable degree on human capital development" (Gyang, 2011, P.70).

Furthermore, policymakers in most industrialized countries appreciate human resource development as the key to addressing difficult issues such as "efficiency, equity, stabilization, and growth;" thus, countries "with limited physical resources, such as Japan and Germany, have sustained superior economic performances…largely because they have been forced to develop their human resources"(Briggs, 1987, 1207). Mottaleb and Sonobe (2012, 245) reiterate that "emerging literature on industrial development stresses the accumulation of human capital by expanding general education to foster industries in developing countries."

The economic growth, development and industrial advancement experienced by most industrial economies of Asia were due in part to greater investment in human capital, such as research and development, education, health and training (Tan, 1997; Nelson & Pack, 1999; Kim & Mah, 2009; Dauda, 2011). Thus, human capital development and utilization have central role to play in industrial development of any nation.

The fundamental question therefore is that what is the link between human capital development cum utilization, and industrial development? It is worthy to note that all advancements, achievements and progress recorded in any society can be traced to human resource/capital stock of such society, which is the only active resource. Developments, innovations, and inventiveness required for industrial development will no doubt emanate from human capital. So, human capital development and its utilization are important for industrial development. Šlaus and Jacobs (2011, P.97) reiterate that "all forms of capital derive their value, utility and application from human mental awareness, creativity and social innovation", which makes human capital as well as "social capital, the central determinant of resource productivity and sustainability." Thus, industrial development and human capital are linked.

Galbraith, as cited in Dauda (2011, P.208) remarking on the US economy noted that "we now get the larger part of our industrial growth not from more capital investment but from investment in men and improvements brought about by improved men." Moreover, industrialization in Britain and France was as a result of scientific and advanced knowledge, which further enhanced more innovations, their usage and entrepreneurial development (see Jacob, 2014; Squicciarini & Voigtländer, 2015).

Development and optimal performance of industries requires human capital development and utilization. According to Adejumo, Olomola and Adejumo (2013, P.639), the poor performance of most industries in developing countries can be traced to the "absence of technical know-how in relevant industries" and "relevant skills to drive technology production and usage." The technical know-how and relevant skills referred to by the authors are in actual fact, human capital. As such, development of the industrial sector, which is central to industrialization requires skilled personnel and extensive technology innovative management techniques, which have to do with human capital development (Adejumo, Olomola & Adejumo, 2013).

The major difference between advanced and developing economies is that while developed countries have invested and continue to invest rigorously in human capital development activities, developing countries are still lagging behind. This explains why developed countries are industrialized while developing ones are still struggling to industrialize. Thus, industrial development cannot occur outside human capital.

The height attained currently by Singapore in industrial advancement is not without human capital development. In fact, Osman-Gani (2004) noted that human capital development has been the most important single strategy employed by Singapore, which has contributed to its industrialization. As a result of this, the country has made human resource development the core element of her strategic economic plans and continues to invest rigorously in human capital development activities.

Similarly, AbdulKarim and Ahmad (2012) revealed that human capital plays highly important role in the industrial development recorded by Malaysia. According to them, the nation's third Industrial Master Plan (IMP), which covered the period 2006-2020 has human capital as one of the core strategies to achieving the plan. Greater investment was undertaken in education and health, which assisted to improve labour productivity, boost job creation, and further helped to raise output level. Moreover, high labour productivity contributed substantially to low cost of production while greater investment in education and health programmes helped to strengthen the skills, knowledge and capabilities of workers in the manufacturing sector and the entire economy. Thus, industrial or manufacturing sector development requires "the development of human capital, which is an important input for the growth of output in a country" (AbdulKarim & Ahmad, 2012, P.105).

Empirical researches, particularly in advanced and emerging economies across the globe have reported greater influence of human capital on the industrialization. However, the same cannot be said of Nigeria. The empirical studies reviewed below are classified into two. The first cover studies carried out outside Nigeria and the second are those conducted on Nigeria.

Empirical studies outside Nigeria

A number of works have been done on human capital and industrialization outside Nigeria. Most of them reported significant contribution of human capital to industrial development.

Fuente and Ciccone (2003) in their study, which shows the role of human capital in growth and cross-country differences in productivity, found that in OECD countries, human capital accounted for 22% of productivity growth within the period 1960-1990 and for 45% of productivity differential with the sample average in 1990. The authors conclude that human capital development has a significant impact on productivity growth and plays a very critical role in fostering technological change and diffusion.

Ciccone and Papaioannou (2009) found that countries with greater investment in education tend to experience industrial growth as well as adoption of new technologies. This is supported by the findings of Arora and Bagde (2011), who reported that during the period 1990–2003, human capital was the most important factor responsible for the significant growth of software industry and software exports in India.

Furthermore, AbdulKarim and Ahmad (2012), using a single-equation regression model to analyse the role of human capital in achieving sustainable industrial development in Malaysia revealed that the share of human capital (education and health) in manufacturing sector output was the highest between 1981 and 2010.

Mottaleb and Sonobe (2012) employed primary data and found that the human capital (years of schooling) acquired by entrepreneurs contributed significantly to their experience and the industrial growth in Bangladesh. Jingdong, Hena, Zhang, Jingdong, Adil, Khalil, Sahar and Rehman (2018) showed that improvement in human capital (education, health and training) has been important for the growth of industrial and other sectors in Pakistan's economy.

Empirical findings in Africa however, have been mixed. As reported by Anyanwu (2018, P.294), only tertiary education has a positive and significant association with manufacturing valued added (MVA) between 1990 and 2011 in the continent. Whereas, primary education "has an inverted U-shaped relationship with MVA" while secondary education has a negative and significant relationship with MVA. The implication of this for Africa is that extensive investment in tertiary education is important for the growth of manufacturing value added in the continent.

Finally, Hena, Jingdong and Zhang (2019) discovered that in Pakistan, human capital has played very significant role in the growth and development of the manufacturing sector. Measuring human capital using secondary school enrolment, infant mortality rate, and life expectancy, and employing the autoregressive distributed lag (ARDL) bounds testing approach, the authors reported that for the period 1972–2015, human capital had positive and significant impact on the growth of manufacturing sector in the nation.

Empirical studies in Nigeria

Empirical studies in Nigeria tend to be consistent in their findings with respect to human capital impact on industrial development. Most of the studies reported statistically insignificant effect of human capital on industrial development.

Olayemi (2012) examined how human capital investment and industrial productivity relate in Nigeria, over the period 1978 - 2008. The author, using ECM and measuring human capital with government expenditure on education and health found that education has positive but insignificant relationship with the index of industrial production while health relates negatively and insignificantly with index of industrial production in the country. Similarly, Adejumo, Olomola and Adejumo (2013) found that human capital (primary, secondary and tertiary enrollments) although influenced industrial value added, it however, has low impact on industrial output in the country between 1980 and 2010.

Furthermore, Ekesiobi, Dimnwobi, Ifebi and Ibekilo (2016) showed that public expenditure on education in Nigeria relates positively and insignificantly with manufacturing output growth. In the same vein, Udah and Ebi (2017) found that between 1970 and 2014, human capital (secondary enrolment) does not have any significant effect on the pace of industrial development in Nigeria.

Consistent with the above findings is the outcome of the work of Okumoko, Omeje and Udoh (2018). The authors also found a negative and insignificant effect of recurrent education and health expenditures on industrial growth in Nigeria within the period 1976-2016. In line with this is the result of the study conducted by Obikwelu (2018), which showed a positive and statistically insignificant relationship between human capital (government expenditure on education and health) and manufacturing output for the period 1982-2016.

A more current work by Uzochukwu, Matthew and Olohi (2020) diverges from the above. The authors examined the effect of human capital development on manufacturing companies, using Innoson Vehicle Manufacturing Co. Ltd in Anambra State and Ibeto Group of Companies Ltd. in Rivers State, Nigeria as case studies. Data were collected from 269 participants in the companies, using questionnaire instrument. The data were analysed with the Pearson Product Moment Correlation. The result indicated that training and development correlate positively and significantly with the performance of manufacturing firms in the study area.

Finally, Omitogun and Longe (2020), having interacted health and education expenditures reported positive and significant impact of the interacted variables on manufacturing output growth during the period 1990-2013 in Nigeria.

It is apparent from the above studies that human capital has not contributed significantly to industrial development in Nigeria. In fact, out of the eight (8) studies reviewed, six (6) of them reported low or insignificant effect of human capital on industrial development in the country. Only one showed that human capital plays significant role in industrial growth while the other, which employed survey data revealed

that training and development correlates positively with performance of manufacturing firms. Moreover, almost all of the studies measured human capital using education and health, with majority of them employing health and education expenditures as human capital measures. In addition, virtually all the studies used the same Error Correction modeling (ECM) approach. One other issue observed about the works is that those of them that found insignificant impact of human capital on industrial development still discussed the results and made recommendations based on this, which is inappropriate.

Industrial Development for Economic Prosperity: Can Nigeria Attain This?

The necessity of industrialization for economic prosperity of nations cannot be over emphasized, and its critical role in the height most advanced economies have reached currently cannot be explained away. Majority of these countries continue to dominate the global market because of their level of industrial development. Nigeria has a lot of lessons to learn from such countries. However, the fundamental question remains whether she is prepared to industrialize or not. If the answer to this question is in the affirmative, then human capital development and utilization policies should be given the highest priority. Facts presented on the state of human capital in the country presuppose that the nation is yet to realize the strategic role human capital plays in industrial development process, which accounts for the low level of industrial development of the nation's economy.

Currently, Nigeria's manufacturing value added (MVA) growth is low and highly fluctuating, from 5.22% in1985 to -13.85% in 1995 and -0.21% in 2017 before rising to 2.09% in 2018 as evident in Figure 3. Any country that wishes to industrialize must increase the share of her manufacturing sector in the GDP because "increasing the share of manufacturing is generally associated with the beginnings of industrialisation and with economic catching up" (AfDB, OECD & UNDP 2017, P.165).

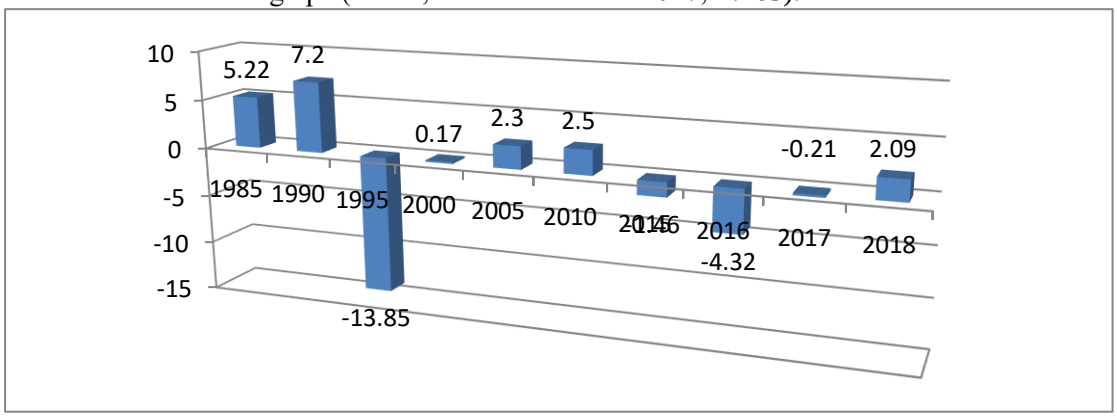


Figure 3: Annual Growth Rate of Nigeria's Manufacturing Value Added (%), 1985-2017
Source: Generated by Author from World Bank (2020)

Table 7 provides information on industrial competitiveness ranking and selected indicators for Nigeria and other countries across the globe. These indicators enable the determination of a country's performance in the area of industrialization. The first part of the table covers data on Nigeria, the second on the first three top countries globally while the third presents information on four selected countries in Africa.

Table 7: Industrial competitiveness ranking/selected indicators for Nigeria and other countries, 2010-2017

Country	*CIP[3] Ranking			CIP Index		MVA Per Capita (2010 $)		Manufactured Exports Per Capita (current $) 2015	Country's Impact on World	
	2010	2015	2017	2015	2017	2015	2017		MVA (%) 2015	Manufactures Trade (%) 2015
Nigeria	98	82	102	0.026	0.0114	254.4	223	91.1	0.4	0.1
First Three Countries in World										
Germany	1	1	1	0.541	0.5146	9,429.7	10,064	14,625.5	6.3	9.8
Japan	2	2	2	0.406	0.4043	8,495.8	10,191	4,484.6	9.0	4.7
China	8	3	3	0.401	0.3687	2047.6	2,254	1,601.4	23.5	18.4
Selected Countries in Africa										
South Africa	38	47	45	0.072	0.0680	952.2	927	876.5	0.4	0.4
Tunisia	59	62	63	0.043	0.0396	683.3	665	1125.2	0.1	0.1
Morocco	69	64	61	0.043	0.0425	474.5	534	511.8	0.1	0.1
Egypt	72	70	71	0.037	0.0338	436.6	410	164.0	0.3	0.1

*Competitive Industrial Performance, Source: Compiled by Author from United Nations Industrial Development Organization (2018 & 2020).

Beginning with CIP index (0.026), Nigeria occupies the 82nd position out of 148 countries in 2015. By 2017 her performance worsened with 0.0114 index, ranking 102 out of 150 countries. Her per capita MVA fell from US$254.4 in 2015 to US$223 in 2017. Her manufactures exports per capita stood at US$91.1 in 2015 while her impact on world MVA and manufactures trade in 2015 were 0.4% and 0.1% in that order. These figures in 2015 show some improvements over 2010 data. However, the performance in 2017 revealed substantial declines.

Compared with other countries as presented in Table 5 above, the nation's performance is far behind most counties in Africa and beyond. This is an indication that Nigeria needs more commitment to industrial development policy. The low state of human capital development and utilization in the country as apparent in the facts presented above appears as drags on industrial development. This is further reinforced by empirical findings, which show insignificant relationship between human capital variables and industrial productivity growth in the country.

For instance, Olayemi (2012), who examined the influence of human capital investment on industrial productivity in Nigeria, using the Error Correction Modelling (ECM) approach, reported insignificant positive effect of government expenditure on education on index of industrial production while government expenditure on health showed negative and insignificant relationship with industrial production index. Similarly, Adejumo, Olomola and Adejumo (2013) using the same methodology discovered that human capital has very low impact on industrial output in the country. The findings of other studies follow the same pattern. Udah and Ebi (2017) found a positive and insignificant influence of secondary school enrolment on industrial output while Ekesiobi, Dimnwobi, Ifebi and Ibekilo (2016) discovered that public education expenditure has a positive but insignificant effect on manufacturing output growth in Nigeria. Moreover, Okumoko, Omeje and Udoh (2018) reported negative and statistically insignificant effect of recurrent expenditure on education and health on industrial growth while Obikwelu (2018) also established a positive and statistically insignificant impact of human capital development on manufacturing output in the country.

The findings of aforementioned studies demonstrate essentially that industrial development will continue to drag if there is no concrete development and utilization of the human capital in Nigeria. The technology, skills and innovation required for industrial development are all generated by human capital. Thus, industrialization cannot occur in any society without substantial contributions from human capital. Therefore, policies aimed at industrializing Nigeria must give high priority to human capital development and utilization.

[3]Competitive Industrial Performance (CIP) index developed by UNIDO, "provides a way to assess countries' industrial capabilities ", encapsulates "the ability of countries to produce and export manufactured goods competitively and achieve structural transformation"(UNIDO (2018, 15).

Conclusion and Policy Implications

The study examines issues surrounding human capital development and utilization as panacea for industrial development in Nigeria. It assessed facts and evidences on human capital development, its utilization and industrial advancement as they affect Nigeria relative to other countries in Africa and beyond.

The findings suggest that industrial development activities in Nigeria are very low compared to other nations of the world. This is informed by less priority placed on human capital development and utilization. Currently, Nigeria's performance in different indicators of human capital development and utilization considered in the study falls short of what is required for industrial advancement. Moreover, the findings of six out of the eight literatures reviewed on Nigeria (Olayemi, 2012; Adejumo, Olomola & Adejumo, 2013; Ekesiobi, Dimnwobi, Ifebi & Ibekilo, 2016; Udah & Ebi, 2017; Okumoko, Omeje & Udoh, 2018; Obikwelu, 2018) revealed that human capital has not contributed substantially to industrial growth in the country. Even the results of the remaining two (Uzochukwu, Matthew & Olohi, 2020; Omitogun & Longe, 2020) were influenced by the methodology employed by the authors. For instance, the work of Uzochukwu, Matthew and Olohi (2020) employed primary (survey) data while Omitogun and Longe (2020) interacted health and education expenditures, which may be questioned.

It is therefore recommended that Nigeria must deliberately put in place specific human capital development and utilization policies, which should be vigorously pursued and implemented for industrial development. Specifically, there is the need for Research and development activities to be well funded. Quality healthcare services should be made available, accessible and affordable to all while rigorous investment in health facilities and infrastructure should be made priority. Budgetary allocation to education and health sectors should be increased to at least 26% and 15% as recommended by the UNESCO and AU respectively. Policies to generate and boost employment opportunities for the large army of unemployed graduates should be formulated. Investor friendly and conducive environment need to be provided to attract both local and foreign investors and also cause firms' activities to thrive in the country. With this, more jobs can be created. Similarly, programmes to identify and empower young persons with entrepreneurial ideas should be put in place. They should be encouraged and supported with soft loans while their products can be showcased. Moreover, factors responsible for the migration of highly skilled labour and professionals out of the country, such as insecurity, high rate of unemployment, dwindling infrastructure, low pay to workers among others should be addressed. This study examines the impact of human capital development and utilization on industrialisation in Nigeria, using stylized facts, descriptive statistics and extensive review of literature to arrive at conclusion. Further study could employ different methodology to reexamine the same issues.

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