

Inequality of Education Distribution and Poverty in Nigeria

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Abstract: This paper addressed the unequal education and poverty in Nigeria case. Specifically, the study determined the magnitude of educational inequality and examined the impact of Nigerian poverty on inequality of education. Using education inequality Gini (EIG) and structural equation modeling (SEM) techniques, findings showed that educational inequality was moderately high in Nigeria with 62.88%. However, the enormity of poverty in Nigeria did not actually explain much of the rising of unequal education, showing poverty impact of 28.7%. Hence, the result indicated that other socioeconomic factors need be investigated. Besides, this paper suggests that pull and push approaches would be required to curb the susceptibility of school age children being trapped by unequal education across households such as introduction of education loan policy and scholarship scheme for the vulnerable children to reduce the rate of education inequality in Nigeria.

Keywords: Unequal education, poverty, education inequality Gini, WarpPLS, education loan, Scholarship, Nigeria

Date of Submission: 29-12-2021

Date of Acceptance: 10-04-2022

“A child or young person’s circumstances, such as their wealth, gender, ethnicity and where they live, play an important role in shaping their opportunities for education and life” (UNESCO, 2013, p.1).

I. Introduction

Interestingly, scholars in the field of economics of education – in the past and present – are still trying to unravel in diverse ways, the impact of education on individual household and economy (Klasen, 2002; Krueger & Lindahl, 2001). Although there was optimism from scholars and technocrats that poverty would end in 2015 (Sachs, McArthur, Schmidt-Traub, Kruk, Bahadur, Faye, & McCord, 2004); Sachs, 2005; UN-MDG, 2015), poverty did not end in 2015 as proposed but currently targeting 2030. This is to buttress the point that poverty is difficult to eradicate. Hence, substantial numbers of previous studies have researched into the relationship between poverty and education in diverse ways. These earlier studies consistently showed that education significantly impacted on growth (Barro, 2001; Barro & Lee, 2013; Krueger & Lindahl, 2001), poverty reduction, gender balance, etc. (Javier Gil-Flores, Padilla-Carmona, & Suárez-Ortega, 2011; Mensah & Kiernan, 2010). In similar study, relationship between unequal education and poverty was investigated (Wu, Zhang & Zhang, 2008), where those with low education fall faster on poverty region. These researches were based on the precise definition of education which places emphasis on endowment in man (inborn powers and capabilities) and the task of education to develop these inborn powers and capabilities (Jelilov, Aleshinloye & Önder, 2016). As cited in Jelilove et al. (2016, p.1862), Pestalozzi, in his famous work, perceived education as “the natural, harmonious and progressive development of man’s innate powers” (Pestalozzi, Johann lived between 1746 – 1827). Despite the intrinsic value of education human and economic development, discrimination and exclusion exist in education distribution across households and countries. The world education distribution in the Sub-Saharan Africa (SSA), using educational attainment of the population aged 25 years and older is presented in Figure 1.

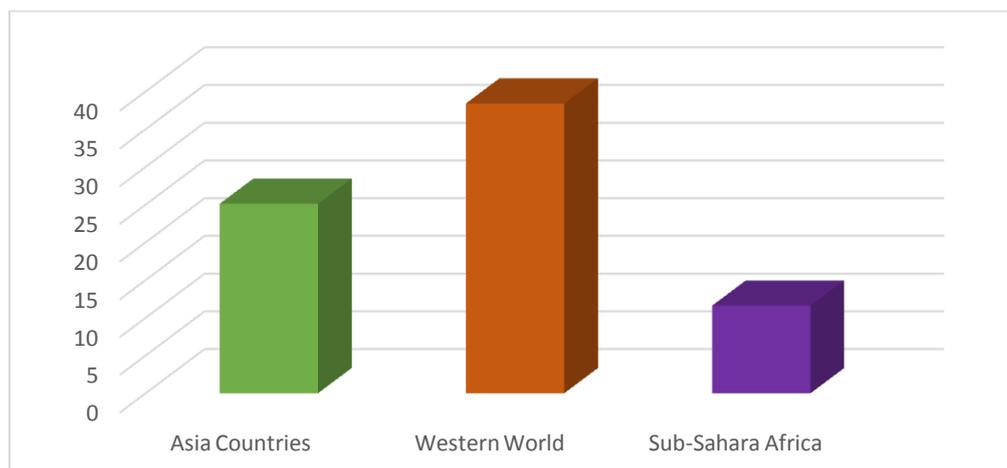


Figure 1: World Education Inequality Measured with Educational Attainment

Source: Obasuyi (2018). A computation from UNICEF (2017) Database on educational attainment of the population aged 25 years and older.

Countries around the world, particularly the developing economies, severally experienced inequality in access and stock of education (Maas & Criel, 1982; Thomas, Wang & Fan, 2001). Some studies showed that the distribution was negatively skewed to female which often made female to be unequal in political participation, exclusion arising from civil and social rights of citizenship (Room, 1995), which Sen (1993) termed as capabilities. This aspect raises an issue in development studies on the quantity of inequality of education and the impact of poverty on educational inequality, particularly, in Nigeria context. Hence, the objective of this paper is to determine the degree of inequality in Nigeria's education distribution and analyse the effect of poverty on the Nigeria educational inequality¹.

II. Nigeria at a Glance

Nigeria got its independence on the 1st of October 1960 and became a republic in 1963. It has a population of over 200 million people in 2020, representing the largest country in the Sub-Saharan African countries. The country is situated in the Gulf of Guinea with enormous natural endowments including lakes, rivers (River Niger and Benue) and large land space containing agricultural land opportunities and forest resources. Besides the land endowments, the country is rich with large field of oil and gas located in the South-south region. Due to the large field of oil, the country is a member of Organization of the Petroleum Exporting Countries (OPEC). To its advantage, other natural endowments include "lead, coal, zinc, limestone, kaolin, ... columbite, tin, barites and gypsum" (Obasuyi, 2018, p. 53) are abundantly situated in Nigeria.

Also, Nigeria is endowed with human resources from the bottom to the top age of the population. Due to the largeness of the population, Nigeria government, over the years, established primary and secondary schools across the 36 States, Federal Capital Territory and 774 Local Governments comprising urban and rural communities. Currently, at the upper boundary of education distribution, the country has 170 approved universities (public, 91 and private, 79) across the country to increase the stock of human capital (Bolaji, 2019). According to the National Universities Commission (NUC), although not enough for the development of the country, there are over nine thousand (9000) Professors (UNN, 2017) in various fields, cumulating to the country's educational elites at the top cadre. Descriptively, the numbers of these experts are insufficient because the Education Index placed Nigeria at 42.5% in 2013 indicating that Nigeria has problem of education inequality of 57.5%. The challenges of human living index - using human Development Index (HDI) yardstick (UNDP-HDR, 2015), Nigeria was ranked 152nd out of 188 countries analysed. The World Bank (2019) ranked Nigeria 152nd out of 157th countries in the 2018 Human Capital Index (HCI), indicating weak human capital accumulation.

Furthermore, the cause of inequality of education was noticed from the ineptitude of the government to hold education as a weapon for development. For example, "there were over 10.5 million out-of-school children in Nigeria where substantial proportion came from the Northern region" (Adewale, 2017; Obasuyi, 2018, p.54). In 2018, the Minister of Education, Adamu Hussaini, posited that these out-of-school children comprised of

¹ This paper draws from my doctoral thesis that was submitted to the University of Malaya (Obasuyi, 2018).

those “with health problems, the socially juvenile children and children displaced during insurgencies” (Obasuyi, 2018, p.54).

Considering Nigeria socio-political sectors, the country has over 250 languages with multiple ethnic groups. Yoruba, Hausa/Fulani and Igbo constitute the three major languages. The Yorubas occupy the southwest; the Hausas/Fulanis live in the north while the Igbos/Ijaws dominate the southeast and the south-south. Politically, the northern part of the country has ruled more than the south in general. However, despite the enough ruling period of the northerners, the northern leaders did not provide enabling environment for the northern youths to cherish western education with effect on social and life insecurities ravaging the region such as Boko Haram disregarding western education philosophy. Currently, as at the time of writing this paper, in attempt to solve herdsmen attack, Federal Government has intention to introduce RUGA colonies across the country which generated heat, the heat that could lead to the country’s disintegration if not properly managed.

Economically, official data placed Nigeria as the 30th largest world economy in 2017. However, oil and services are major source of Nigeria economic growth. Using the World Bank (2017) data, the gross domestic product (GDP) - computed with constant at 2010 US dollar – was \$80.08 trillion. The gross national income per capita (GNI_{pc}), which was \$2,450 in 2016 decreased to \$2,080 in 2017. Nevertheless, the annual growth rate insignificantly rose from -1.6% to 0.8% in 2017. Comparing periods, the previous trend of growth rate was at an average of 4% between 2007 and 2014, indicating economic stability during the period. To grow the economy, the country has appreciable sites for tourism industry. The sites include cold and warm water-spring in Ekiti State, Cross River National Parks, Zuma rock at Abuja, Yankari and water falls at Erin Ijesha in Osun State, etc. However, tourism industry has been confronting with poor patronage attributable to life insecurity (Achumba, Ighomereho & Akpor-Robaro 2013; Katsina, 2012), thereby underutilized. Currently, the national goal of the Federal Government is to redirect the economy from oil driven to agricultural productions and sustainability such as the on-going Lagos mass production of rice. Upon these, what are the Nigerian development crises or challenges?

The Nigerian development crisis is not far from poor governance that produces high rate of unemployment for the teeming graduates of the universities, polytechnics and colleges of education. In turn, the problem of unemployment is not far from the poor investment in the real sector of the economy, with particular reference to the failing industries in the country. Like in the ancient Egypt, corruption and poor institutions are plagues affecting the country’s economy. Besides, other economic and political crisis that envelope the country include “over dependency on oil, poor diversification of the economy, poor governance, poor financial management system, poverty, left behind in human development indices (*health, standard of living and education*), poor institution, persistence of insecurity and poor infrastructure” (Obasuyi, 2018, p. 55; World Bank, 2018, December 12). Furthermore,

“The North-South divide has widened in recent years due to the Boko Haram insurgency and a lack of economic development in the northern part of the country. Large pockets of Nigeria’s population still live in poverty, without adequate access to basic services, and could benefit from more inclusive development policies. The lack of job opportunities is at the core of the high poverty levels, of regional inequality, and of social and political unrest in the country” (World Bank, 2019, April 9)

Hence, this paper examines the quantity of inequality of education existing in Nigeria. It further analyses the extent to which education inequality impacted on poverty.

III. Methodology

The paper used data from USAID Demographic Health Survey (DHS, 2013) taking across the Nigerian six geopolitical zones. In the DHS data, 119, 386 were taken as total sample for Nigeria.

3.1. Model Specification

Estimating the total inequality of education across the country, this sample of 119,386 were analysed with education inequality Gini (EIG) technique. The EIG follows the Agrawal (2014) methodology - as adapted in Obasuyi (2018) - is specified in equation (1.1).

$$EIG = \frac{1}{2\mu} \sum_{i=1}^n \sum_{j=1}^n p_i |y_i - y_j| p_j \tag{1.1}$$

The *EIG* is the Gini of education, and μ is defined in equation (1.2) as:

$$\mu = \sum_{i=1}^n p_i y_i = MYS \tag{1.2}$$

The y_i and y_j in equation (1.1) and (1.2) represent the years of schooling for educational levels attained by individuals. The p_i and p_j are the proportions of the population. Although Barro and Lee (2013) proposed seven (7) levels, there are just six levels in the data used in the analysis (See Table 1). From the data, it is assumed that all admitted candidates into the tertiary institutions completed their tertiary education. Thus, the Gini of education “measures the ratio to the mean years of schooling (MYS) of half of the deviations from average schooling between all possible pairs of households” (Obasuyi, 2018, p.136)

Table 1: USAID-DHS Educational Levels

Educational Levels	Weight
No Education	0
Incomplete Primary	1 (i.e. the weight representing ½ (6) years
Complete Primary	2 (i.e. the weight represents 6 years completed
Incomplete Secondary	3 (i.e. the weight representing 6(1/2 (6)
Complete Secondary	4 (i.e. the weight representing 12 years completed
Completed Tertiary	5 (i.e. the weight representing 16 years completed

Source: Author, as adapted from the USAID-DHS Coding of educational attainment (see Obasuyi, 2018 and Obasuyi & Rasiah, 2019)

The estimated EIG contained the values between 0 and 1. The zero (0) value implies perfect equality in the distribution of education. While the value of 1 implies perfect inequality of the distribution. The values between zero (0) and one (1) explained the degree of deviation from perfect equality of the distribution. So, the higher the value of EIG, the higher the inequality of education.

The second issue to address is the impact of poverty on Nigeria education distribution. The study used structural equation modeling (SEM) to estimate the relationship between poverty and educational inequality in Nigeria. Although we took sample out of sample (SOS) (Knaub Jr, 2015) to comply with the estimation techniques of SEM, the DHS data were used. Because the original population was known, the study employed simple random sampling to select 382 sample out of the sample using SPSS version 22. The sample size was determined using Krejcie and Morgan (1970) determination Table. The estimation technique using SEM, WarpPLS version 5 was used because it has greater advantages than the SmartPLS software such as calculating the p-value, the effect size and missing values (Kock, 2014). Figure 1 presents the structural model of poverty-education inequality relationship.

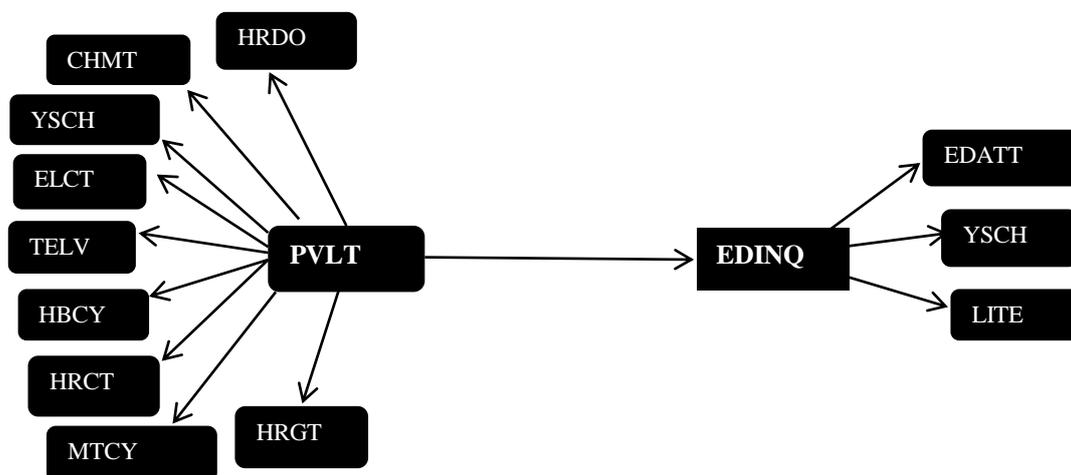


Figure 2: Poverty-education inequality relationship structural model

Note: See Appendix1 for variables’ description.

Source: Author, Obasuyi (2018), UM Thesis

IV. Results and Discussion

4.1. Results

This section presents the results of the Gini of education inequality and the relationship between poverty and educational inequality. To explain objective one, Table 1 displays the Nigeria educational inequality.

Table 2: Results of Education Inequality Gini and MYS

Country	DHS – SP	MYS	EIG	Year
Nigeria	119,386	4	0.6288	2013

Source: Obasuyi (2018).

Note: The EIG (education inequality Gini) results classified into four categories: Very low ($EIG \geq 0 \leq 0.25$); Moderately Low ($EIG > 0.25$ but ≤ 0.5); Moderately High ($EIG > 0.5$ but ≤ 0.75); Extremely High ($EIG > 0.75$); DHS – SP = Demographic Health Survey Sample Population; MYS = mean years of schooling.

Table 1 shows that, using the total sample population of USAID DHS data, Nigeria education inequality analysis was 62.88% which falls on the moderately high inequality. The value would have risen if the study considered the rising of internally displaced people (IDP) and the Boko Haram insurgency in the northern part of Nigeria to date. Previous studies have shown that a country’s human stock is measured by the mean years of schooling (MYS) (Potančoková & Goujon 2014; Thomas et al., 2001). In other words, the degree that an economy could accumulate the stock of human capital overtime is determined by the MYS. In the Table 1, the estimated value of MYS is given as 4, indicated a very low proportion compared with the cumulated 16 years of schooling. Although there are large number of Universities, Polytechnics and Colleges of Education in Nigeria, low development witnessed over the years correlates with the very low human capital accumulated across the country. “This aspect of ... (low) MYS requires considerable attention” by the Nigeria government (Obasuyi, 2018, p.238).

Furthermore, having understood that educational inequality was moderately high in Nigeria, it is imperative to understand whether poverty accounted for the high inequality of education in Nigeria. Using the same data set, the author presented the SEM results of the relationship between poverty and educational inequality in Table 2.

Table 3a: Model Fit and Quality of Indices Results

Country	AFVIF (Model Multicollinearity Test)		Tenenhaus Goodness of Fit Test T(GoF)		Simpson Paradox Ratio (SPR)	
	Value	Decision	Value	Decision	Value	Decision
Nigeria	1.085	Absence	0.189	Medium	1	Satisfied

Note: Average full collinearity VIF (AFVIF): **Threshold** - Acceptable if ≤ 5 , ideally ≤ 3.3 . Tenenhaus GoF (GoF): **Threshold** - Small ≥ 0.1 , Medium ≥ 0.25 , Large ≥ 0.36 . Simpson’s paradox ratio (SPR): **Threshold** - Acceptable if ≥ 0.7 , ideally = 1”.

Source: Obasuyi, (2018, p.188)

Table 3b: Model Fit and Quality of Indices Results (Contd)

Country	RSCR		SSR		NLBCDR	
	Value	Decision	Value	Decision	Value	Decision
Nigeria	1	Satisfied	1	Satisfied	1	Satisfied

Note: R-squared contribution ratio (RSCR): **Threshold** - Acceptable if ≥ 0.9 , ideally = 1. The Statistical suppression ratio (SSR) **Threshold** – Acceptable if ≥ 0.7 and NLBCDR = Nonlinear bivariate causality direction ratio”

Source: Obasuyi (2018, p.189).

Table 3a and 3b displayed the test results of various statistical tests carried out on the structural model fit. The tests included multicollinearity test, Tenenhaus Goodness of Fit Test T(GoF); Simpson Paradox Ratio (SPR); R-squared contribution ratio (RSCR); Statistical suppression ratio (SSR) and Nonlinear bivariate causality direction ratio. Individual tests satisfied the statistical threshold, indicating that our structural model was well fitted. Thereafter, internal consistency of the model was estimated. Results are displayed in Table 4.

Table 4: Internal Consistency

Country	Cronbach Alpha		Composite Reliability	
	EDINQ	PVL T	EDINQ	PVL T
Nigeria	0.547	0.431	0.763	0.628

Note: Cronbach Alpha threshold is ≥ 0.7 while composite reliability is ≥ 0.6 .

Source: Obasuyi (2018, p.192).

Although the estimated values of Cronbach Alpha did not satisfy the statistical threshold, the value of composite reliability indicated that the model was internally consistent with values above the threshold of 0.6. The average variance extractor (AVE) showed the value of 0.586 and 0.279 for poverty and educational inequality respectively. The discriminant validity was equally satisfied. Since there was efficient model fit, internal consistency was satisfied and discriminant validity was satisfied, the study presented the results of the structural model in Table 5.

Table 5: Poverty and Unequal Education Structural Model Result

Country	Coefficient	p-value	SE	Effect Size	R ² – EDINQ
Nigeria	0.287	0.001*	0.049	0.082	0.082

*Note: p-value at 0.05**

Source: Obasuyi (2018, p. 194), UM Thesis

Table 5 indicated that the poverty coefficient was 0.287 and statistically significant at 0.05 level of significance. Although Nigeria poverty is high, poverty has only 28.7% impact on the rising of educational inequality earlier computed for Nigeria. In other words, the impact of poverty on educational inequality is smaller if compared with the spread of poverty across the country. This suggests that there are other vital variables other than poverty that could be responsible for the high level of education inequality, as corroborated by the result of R-squared of 8.2%.

4.2. Discussions

Across the globe, earlier proposition was that low and unequal education causes poverty. For example, relationship between unequal education and poverty was investigated (Wu, Zhang & Zhang, 2008). The truth was that those with low education fall faster on poverty region. While the position was right for Nigeria, the proportion of the impact of unequal education on poverty is not proportional to the spread of poverty across the country.

V. Conclusion and Policy Implication

This paper examined Nigeria education distribution with education inequality Gini and determined the impact of poverty on the rising of educational inequality across the country. The study found that educational inequality was above the average. In other words, educational inequality was moderately high in Nigeria with the value of 62.88% using educational attainment. However, although Nigeria is known as the capital city of world poverty (Sanusi, 2019), the Nigeria unequal distribution of education could not be pinned down on the economic problem of poverty because of its little impact if compared with Nigeria poverty enormity. Instead, other aspect that Obasuyi (2018) pointed out included the redistribution of income coming from oil proceeds to affect household welfare. Likewise, many household children are unwittingly susceptible to dropout from school due to high school fees, insecurity challenges, income inequality, particularly the income gap between the political office holders and the people. Therefore, government needs to introduce pull and push strategies to ensure all school-age children climb all educational ladders during the 16 years of schooling. Specifically, government needs to introduce education loan and scholarship to support the vulnerable children to cushion the effect of being susceptible to unequal education, particularly, controlling for the high school fee factor at the tertiary education. Finally, restructuring educational apparatuses, particularly the upper boundary of education distribution (the university, polytechnics and colleges of education), to integrate the poor households into sustainable educational movement, is highly suggested. In other words, a state of emergency is suggested on the rebranding and restructuring the middle and tertiary education systems to allow free movement from elementary education to the seventh level of education distribution (Barro & Lee, 2013). The rebranding should follow the SDG-4 goal on education.

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Appendix 1: List of Variables

List of Latent Variables		List of Manifest Variables			
Names	Acronyms	Names	Acronyms	Names	Acronyms
Education	EDINQ	Education Attainment	EDATT	Motorcycle	MTCY
Inequality					
Poverty	PVLT	Years of schooling	YSCH	Television	TELV
		Literacy	LITE	Child Mortality	CHMT
		Electricity	ELCT	Bicycle	HBCY
		Has Radio	HRDO	Refrigerator	HRGT
		Has Car	HRCT		

Source: Obasuyi (2018).

Folorunso Obayemi Temitope OBASUYI1, "Inequality of Education Distribution and Poverty in Nigeria." *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*, 27(04), (2022): pp. 41-48.