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Democracy and Lifelong Learning in Africa

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Abstract

Education has been cited in both theoretical and empirical literature as a key driver of socioeconomic growth. African educational outcomes, however, continue to be subpar at all levels. This study examines the impact of democracy on lifelong learning in 52 African countries from 1990 to 2020, employing Fixed Effects regressions. Six democracy indicators, which include electoral, liberal, participatory, deliberative, egalitarian, and total democracy, derived from the principal component analysis (PCA), are employed in the study. The study also utilizes four education variables to capture lifelong learning in Africa and includes primary, secondary, and tertiary school enrolment, as well as a lifelong learning index derived from the PCA. The findings reveal that improving the quality of democracy in Africa can significantly enhance primary school enrolment. The study also finds that improving electoral, participatory, and egalitarian democracy significantly improves secondary school enrolment in the presence of endogeneity. Additionally, improving egalitarian democracy significantly spurs tertiary education. These findings show the importance of political institutions in enhancing educational attainment and lifelong learning in Africa.

Keywords: Democracy, Lifelong Learning, Africa, Fixed Effects Model, Instrumental Variable

1. Introduction

The positioning of the study on the relevance of dynamics of democracy (i.e., electoral, liberal, participatory, deliberative, egalitarian, and total democracy) in education and lifelong learning in Africa is motivated by three main factors from policy and scholarly literature, notably: (i) importance of lifelong learning; (ii) the role of democracy in institutional and macroeconomic outcomes and (iii) gaps in the lifelong learning and democracy literature. The factors are expanded in the same chronology as highlighted.

First, the importance of lifelong learning is clearly apparent in the United Nations' sustainable development goals (SDGs) agenda of 2030. Accordingly, the United Nations' Agenda 2030 is a plan of action for prosperity, the planet, and people. Of the 17 underlying SDGs, SDG4 is most relevant to the present study, not least because it aims to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all". The SDG4 agenda is clearly articulated in recent African-centric studies which have focused on the importance of education and lifelong learning as well as the development of strong institutions for the achievement of SDGs (Tchamyou, 2020; Asongu et al., 2020a, 2022; Adejumo et al., 2021; Berchin et al., 2021; Nafukho & Muyia, 2021; Njangang et al., 2021). The narratives on institutions and education are substantiated in the next two paragraphs, respectively.

Second, the role of democracy in institutional and macroeconomic outcomes can be understood in the light of the documented importance of quality governance in favorable development outcomes (Ajide & Raheem, 2016a, 2016b; Pelizzo et al., 2016; Asongu & Kodila-Tedika, 2016; Pelizzo & Nwokora, 2016, 2018; Nwokora & Pelizzo, 2018). Building on the premise that democracy is fundamental in promoting good governance, it is logical to associate democracy with education and lifelong learning, not least because good governance has been established to affect quality education in contemporary inclusive development literature (Asongu & Odhiambo, 2020). The present study extends the attendant literature on the quality of institutions by assessing the importance of democracy in education and lifelong learning, not least because of an apparent gap in the contemporary lifelong learning literature.

Third, the contemporary lifelong learning literature has largely focused on *inter alia*, the importance of quality education and lifelong learning in sustainable development in Africa (Nafukho & Muyia, 2021); lifelong learning as a cruel optimism (Black, 2021); education for

self-reliance and the corresponding importance in lifelong learning in former colonies (Maluleka, 2021); understanding the extent to which various post- and pre-independence governance typologies have affected how lifelong learning promotes economic development (Biao, 2021); nexuses between education, lifelong learning, inequality and economic growth (Tchamyou et al., 2019); the role of foreign aid in lifelong learning (Asongu & Tchamyou, 2017) and the relevance of lifelong learning in political stability and non-violence (Asongu & Nwachukwu, 2016a).

The last two studies above are the closest in the literature to the present research. On the one hand, Asongu and Nwachukwu (2016a) have concluded that the effect of lifelong learning on political stability is higher compared to the combined independent effects of the three levels of education constituting the lifelong learning indicator. The study is focused on 53 African countries using data from 1996 to 2010, and the empirical evidence is based on the generalized method of moments (GMM). Asongu and Tchamyou (2017) have equally used data for the period 1996–2010 and the GMM technique to establish that foreign aid promotes lifelong learning.

The present study departs from those closest in the literature by: (i) using more updated data (i.e., from 1990 to 2020); (ii) employing an instrumental variable Fixed Effects (FE) model to account for endogeneity while also accounting for heteroskedasticity and serial correlation; and (iii) positioning on the relevance of democracy dynamics (i.e., electoral, liberal, participatory, deliberative, egalitarian, and total democracy) in education and lifelong learning.

The rest of the study is structured as follows. The theoretical underpinnings and related literature are covered in Section 2, while the data and methodology are provided in Section 3. Section 4 presents the empirical findings, while Section 5 concludes with implications and future research directions.

2. Conceptual clarification and theoretical underpinnings

The conceptual framework used in this study typically builds on contemporary lifelong learning literature (Asongu & Tchamyou, 2017; Tchamyou et al., 2019; Tchamyou, 2020) which has highlighted the shortcomings of a comprehensive measurement of lifelong learning in developing countries such as those in Africa. In accordance with the attendant literature, lifelong

is measured in terms of the combined knowledge achieved from going through the three main levels of education, namely: primary, secondary and tertiary. The lifelong learning index is derived from principal component analysis (PCA) with each of the educational levels constituting components of the lifelong learning index. Accordingly, the study is consistent with the justification that because a comprehensive lifelong learning indicator is not yet apparent for African countries, deriving a lifelong learning indicator from the existing educational levels by means of PCA is worthwhile. To put the concern into perspective: "*To date only two macro level studies, i.e., the European Lifelong Learning Indicators (ELLI) instrument developed by the EU (2010) and the Composite Learning Index (CLI) instrument developed by the Canadian Council on Learning (undated.), have dealt with this issue*" (Luo, 2015, p.19). In accordance with the attendant African-centric lifelong learning literature (Asongu & Tchamyou, 2019), two positions merit clarification: (i) the ELLI is relevant to European countries and (ii) the CLI is specific to Canada. It is in the light of the shortcoming that the present study is in accordance with the extant literature on the subject by conceiving and understanding lifelong learning as the combined knowledge that is acquired in the course of the three main levels of education.

The theoretical underpinnings' supporting the nexus between democracy and educational outcomes is consistent with extant theoretical underpinnings on the linkage between democracy and economic development outcomes. As maintained by Asongu and Nwachukwu (2016b), two main theoretical strands have been documented on democracy and quality of institutions. On the one hand, there is a demand-side which entail culturalist theoretical approaches and on the other, a supply-side pertaining to democracy and institutional quality. The first strand, according to Charron and Lapuente (2010) on the culturalist theoretical framework maintains that democratic institutions are fixed and variation in subsequent institutional and development outcomes are traceable to value and social preferences. Contextualising the theoretical premise to this study, it can be posited that democracy dynamics (i.e., electoral, liberal, participatory, deliberative, egalitarian, and total democracy) are fixed and that lifelong learning is the outcome of variations in values and social preferences. By implication, a significant effect of democratic institutions is not expected to affect lifelong learning. It follows that ordinary people are principal players that influence cultural values which determine the type of institutions and economic development prospects such as lifelong learning. The attendant values in society motivate citizens to mobilize powerful collective prospects that put pressure on the elite to provide quality democracy and

institutions. According to the theoretical positioning, various demands of social nature cannot completely clarify the level of government quality that is observed. Hence, the supply-side is worth accounting for.

With respect to the supply-side, democracy and political institutions affect institutional quality. Within this framework or institutionalist view, preferences of actors in the light of standard assumptions of rational-choice are constant and corresponding difference of governance quality levels are contingent on how motivations of individuals are influenced by political or democratic institutions. The implication here is that principal actors are rules from one specific type (or sub-type) of democratic regime. Hence, citizens demanding democratic institutions and good governance play a virtually minor role, if any, not least because the inhabitants of a country are expected to be individuals who are hardworking and ready to foster innovative technologies if those in power produce optimal democratic institutions that are consistent with quality governance levels.

The theoretical nexus between democracy and macroeconomic outcomes such as lifelong learning can also be understood within the remit of the time and level hypotheses for the benefits of democracy. The attendant time and level hypotheses are premised on a non-linear nexus between democracy and macroeconomic outcomes (Asongu & Nwachukwu, 2016b). According to the time strand, young democracies are expected to be less significantly associated with favorable macroeconomic outcomes, compared to old democracies. With respect to the level strand, countries that have invested more in consolidating democratic institutions are expected to influence economic development outcomes more favorably compared to countries in which less investments have been made to consolidate existing democratic institutions (Montinola & Jackman 2002; Shen, 2002; Back & Hadenius 2008; Sung 2004; Asongu & Nwachukwu, 2016b).

3. Methodology and Model Specification

3.1 Methodology

This study utilizes three varieties of the FE model to investigate the influence of democracy on lifelong learning in Africa. On the one hand, the study employs the traditional FE model,

accounting for heteroskedasticity. On the other hand, the Driscoll and Kraay (DK) (1998) FE model is employed to account for serial correlation, groupwise heteroskedasticity, and cross-sectional dependence. The study also employs the instrumental variable FE model to account for endogeneity while also accounting for heteroskedasticity and serial correlation. The use of all three FE models is to account for the robustness of the individual results.

The FE model is such that:

$$education_{i,t} = \alpha_0 + \alpha_1 democracy_{i,t} + X_{i,t} + \mu_i + \varepsilon_{i,t} \quad (1)$$

Here, $education$ represents four indices of education, which include primary school enrolment, secondary school enrolment, tertiary school enrolment and a lifelong learning index derived from the three education indices using principal component analysis (PCA). $democracy$ represents six indicators of democracy and includes the electoral democracy index, the liberal democracy index, the participatory democracy index, the deliberative democracy index, the egalitarian democracy index, and total democracy derived from the PCA. X is composed of three control variables, which include gross domestic product (GDP), unemployment, and government expenditure on education. These control variables have been utilized in the studies of Thierry and Emmanuel (2022), Ihugba, Ukwunna and Obiukwu (2019), Shafiq (2010), and Anyanwu and Erhijakpor (2007). Equation (1) can thus be re-written as:

$$education_{i,t} = \alpha_0 + \alpha_1 democracy_{i,t} + \alpha_2 GDP_{i,t} + \alpha_3 unemployment_{i,t} + \alpha_4 expenditure_{i,t} + \mu_i + \varepsilon_{i,t} \quad (2)$$

While i is the cross-sectional index, t is the time index.

In deriving a democracy index and a lifelong learning index using PCA, the study follows the studies of Asongu et al. (2017) and Tchamyou (2020). According to Iheonu (2019), the construction of the new variable using the principal component still accounts for most of the information in the original data set. Kaiser (1974) and Jollife (2002) note that only common factors that have an eigenvalue greater than one should be retained in the computation of the new indexes.

3.2 Data

This section begins with brief definitions of all the variables to be utilized in the model. This section also presents a scatterplot on the relationship between democracy and primary school enrolment in an attempt to visually undercover the underlying relationship between the indicators of democracy and education in Africa.

According to Coppedge et al. (2018), electoral democracy gauges the fundamental principles that a country must uphold in order to be considered democratic. Selseng, Linnerud, and Holden (2022) identify that the index employs Dahl's concept of polyarchy and identifies five political institutions as defining contemporary representative democracy. They consist of elected officials; regular, free, and fair elections; media freedom and freedom of expression; freedom of association; and universal suffrage. The democratic ideal of defending individual and minority rights from the tyranny of the state and the tyranny of the majority is embodied in liberal democracy. High-scoring nations on this index have constitutions that guarantee civil freedoms; a strong judicial system that is independent and whose rulings are upheld by the administration; and a strong legislative body that has the authority to look into, monitor, and challenge the executive.

Active citizen participation in electoral and non-electoral processes, as well as the existence and effectiveness of local and regional democratic institutions, are all components of participatory democracy. Countries that have strong local and/or regional governments, high levels of direct democracy, and high levels of civil society participation perform well in this index. On the other hand, deliberative democracy focuses on how a polity makes decisions and has five elements. The first component assesses whether decision-makers in policy processes provide a public and reasoned justification; the second assesses whether the common good is emphasized in these justifications; the third assesses whether political elites acknowledge and respect counterarguments; the fourth assesses the extent of elite consultation; and the fifth assesses whether public debate and discussions during policy processes are open to and characterized by an engaged society.

The subcomponents of equal protection (individual rights and freedoms are protected equally across social groups), equal access (access to power is equally distributed across groups, genders,

and socioeconomic classes), and equal distribution are used by egalitarian democracies to measure material and immaterial equality (resources are equally distributed). A more equal society denotes a better quality of institutions and reflects countries with more advanced democracies. In general, the democracy indicators have a score between 0 and 1 (from low to high).

School enrolment (% gross) at primary, secondary, and tertiary levels is the ratio of total enrolment, regardless of age, to the population of the age group. GDP per capita is gross domestic product per capita, which is the measure for economic growth. The total unemployment rate is the total number of unemployed in each of the countries in the model as a share of the total labor force. Government expenditure on education is the share of government expenditure on education in total government expenditure. The Democracy Index and Lifelong Learning Index are derived from the PCA to measure the total effect of democracy on lifelong learning in Africa.

Table 1: Definition of Variables

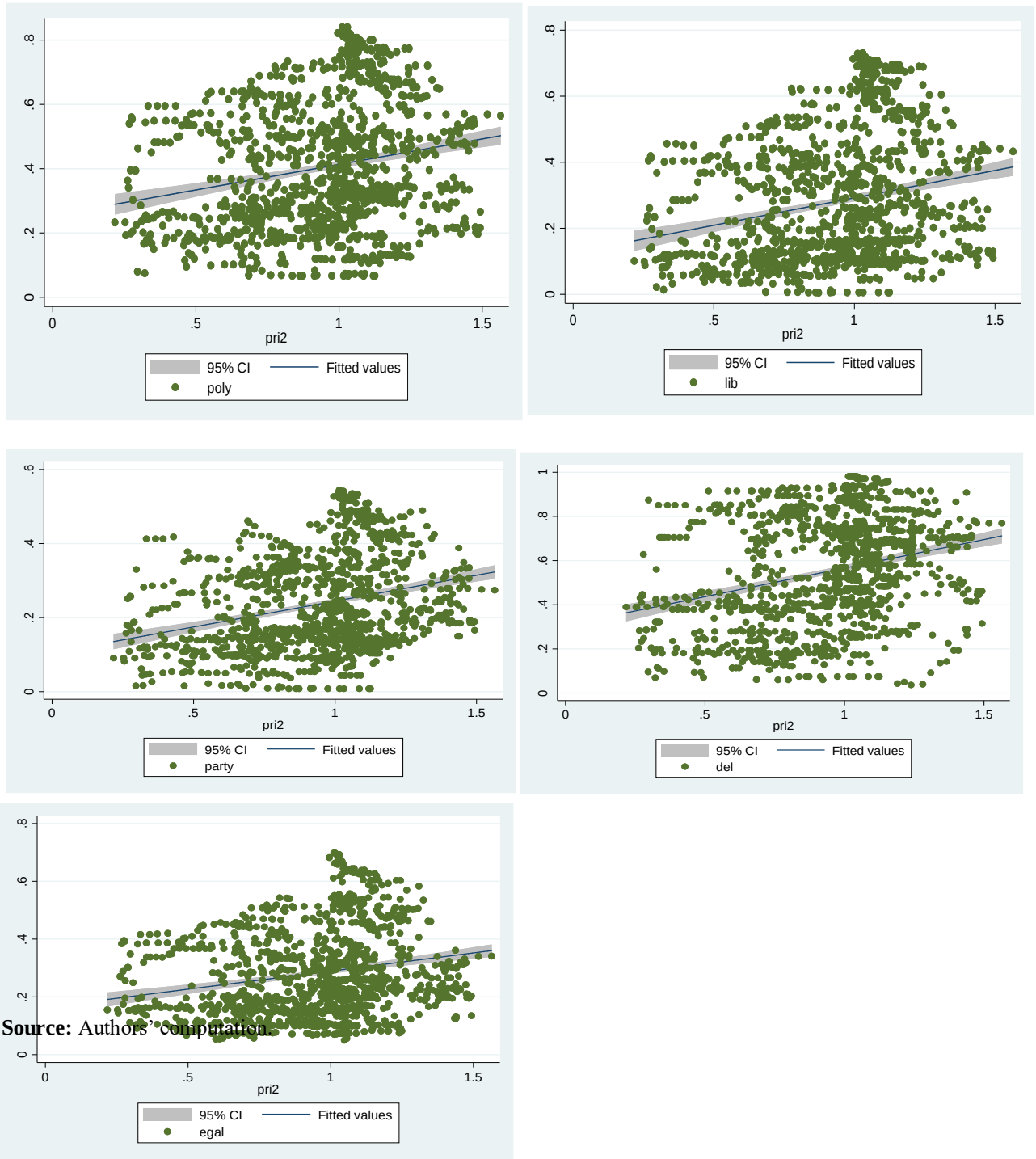
Variables	**Functional Definitions**	**Sources**
Elect	Electoral Democracy	V-Dem Institute (2022)
Lib	Liberal Democracy	V-Dem Institute (2022)
Part	Participatory Democracy	V-Dem Institute (2022)
Del	Deliberative Democracy	V-Dem Institute (2022)
Egal	Egalitarian Democracy	V-Dem Institute (2022)
Democracy Index	Democracy Index	Authors computation
PSE	Primary School Enrolment (% gross)	WDI (2022)
SSE	Secondary School Enrolment (% gross)	WDI (2022)
TSE	Tertiary School Enrolment (% gross)	WDI (2022)
Lifelong Learning	Lifelong Learning Index	Authors' computation
GDP	GDP per capita, constant $US	WDI (2022)
Unem	Total Unemployment (% of total labor force), ILO estimate.	WDI (2022)
Expenditure	Government Expenditure on Education, total (% of government expenditure)	WDI (2022)

Source: Authors' compilation.

Note: ILO represents International Labor Organization. WDI is World Development Indicators. V-Dem is Variety of Democracy.

Figure 1 shows a scatterplot on the relationship between the democracy indicators and primary school enrolment. The figure reveals a positive association between the indicators of democracy and primary school enrolment in Africa. However, the figure also shows difference in slope, reflecting difference on the influence of the indicators of democracy on primary school enrolment. Since scatterplots do not necessary mean imply causation, it becomes necessary for the use of advance econometric techniques to examine the effect of democracy on lifelong learning in Africa.

Figure 1: Scatterplot of Democracy Variables[1] and Gross Primary School Enrolment, 1990-2020.



Source: Authors' computation.

[1]Note: Poly is electoral democracy, lib is liberal democracy, party is participatory democracy, del is deliberative democracy and egal is egalitarian democracy. Pri2 is gross primary school enrolment.

4. Empirical Results

This section of the study presents the correlation matrix and the impact of democracy on lifelong learning in Africa. The correlations among the variables are analyzed to ensure that variables that are highly collinear are not placed in the same models, thereby avoiding multicollinearity. Table 2 reveals that electoral democracy, liberal democracy, and egalitarian democracy have negative correlations with primary school enrolment, while participatory democracy and deliberative democracy are positively correlated with primary school enrolment. Furthermore, the findings show that all the indicators of democracy are positively correlated with secondary and tertiary school enrolments. The correlation matrix further shows that the indicators of democracy are highly correlated with each other, revealing the need to estimate their effects in separate models. However, other right-hand side variables have no substantial correlation, revealing the absence of multicollinearity. In Table 3, the impact of democracy on primary school enrolment is revealed. The findings show that all the indicators of democracy have a significant impact on primary school enrolment, revealing that improving the quality of democracy in Africa will improve gross primary school enrolment. The finding supports the findings of Dahlum and Knutsen (2017), who showed that democracy enhances the average years of schooling. The findings across the estimated models show that accounting for endogeneity enhances the impact democracy has on gross primary school enrollment. Furthermore, the study finds that participatory democracy has the most substantial impact on primary education, as revealed by the magnitude of its coefficient. This means that when citizens participate in electoral and non-electoral processes, there will be a substantial improvement in primary school enrolment in Africa. This is because public policy will become more inclusive of the needs of citizens. Additionally, the results of the study revealed that GDP positively but insignificantly influences primary school enrolment in the FE and FE-DK models, but significantly influences primary school enrolment when endogeneity is accounted for in the IV-FE model, except for the model where participatory democracy is the indicator for democracy. The results also show that unemployment does not significantly influence primary school enrolment when endogeneity is accounted for. Further findings show that government expenditure on education is significant in spurring primary school enrolment in Africa, supporting the results of Idress, Khan, and Fauzee (2021).

Table 2: Correlation Matrix

	PSE	SSE	TSE	Elect	Lib	Party	Del	Egal	GDP	Unem	Expenditure
PSE	1.000										
SSE	0.3321	1.000									
TSE	0.1493	0.8453	1.000								
Elect	-0.0546	0.4548	0.3424	1.000							
Lib	-0.0345	0.5139	0.3870	0.9777	1.000						
Party	0.0296	0.4975	0.3688	0.9581	0.9572	1.000					
Del	0.0096	0.3820	0.3230	0.8302	0.8256	0.7877	1.000				
Egal	-0.0063	0.5333	0.4409	0.9569	0.9746	0.9347	0.8261	1.000			
GDP	0.1304	0.8387	0.7743	0.4223	0.4810	0.4474	0.4121	0.4831	1.000		
Unem	0.1166	0.3996	0.1913	0.0946	0.1496	0.0940	0.0751	0.1493	0.4534	1.000	
Expenditure	0.1851	0.1949	0.1218	0.0659	0.1120	0.0579	0.1168	0.1513	0.0751	0.1892	1.000

Source: Authors' computation.

Table 3: Impact of Democracy on Primary School Enrolment in Africa

	FE					DK-FE					IV-FE				
Constant	0.5491	0.5648	0.5724	0.4495	0.5336	0.5491	0.5648	0.5724	0.4495	0.5336	-	-	-	-	-
	(0.454)	(0.437)	(0.418)	(0.564)	(0.463)	(0.285)	(0.273)	(0.237)	(0.406)	(0.296)					
GDP	0.0193	0.0295	0.0088	0.0427	0.0235	0.0193	0.0295	0.0088	0.0427	0.0235	0.1119*	0.1276**	0.0879	0.1492**	0.1145*
	(0.848)	(0.767)	(0.927)	(0.680)	(0.814)	(0.777)	(0.669)	(0.890)	(0.551)	(0.731)	(0.058)	(0.032)	(0.140)	(0.012)	(0.057)
Unem	-0.0056	-0.0062	-0.0047	-0.0062	-0.0054	-0.0056**	-0.0062**	-0.0047*	-0.0062**	-0.0054**	-0.0005	-0.0015	-0.0004	-0.0014	-0.0005
	(0.460)	(0.403)	(0.519)	(0.416)	(0.469)	(0.048)	(0.030)	(0.059)	(0.037)	(0.049)	(0.900)	(0.694)	(0.935)	(0.723)	(0.916)
Expenditure	0.0089***	0.0086**	0.0088**	0.0091***	0.0085**	0.0089***	0.0086***	0.0088***	0.0091***	0.0085***	0.0089***	0.0083***	0.0088***	0.0089***	0.0083***
	(0.009)	(0.012)	(0.011)	(0.005)	(0.014)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Elect	0.4513**					0.4513***					0.5969***				
	(0.017)					(0.001)					(0.001)				
Lib		0.3954**					0.3954***					0.4297**			
		(0.042)					(0.002)					(0.016)			
Part			0.9085***					0.9085***					1.1681***		
			(0.000)					(0.000)					(0.000)		
Del				0.2426**					0.2426***					0.3234***	
				(0.041)					(0.008)					(0.001)	
Egal					0.6190**					0.6190***					0.7985***

					(0.011)					(0.001)					(0.001)
R^2	0.1201	0.0960	0.1570	0.0876	0.1064	0.1201	0.0960	0.1570	0.0876	0.1064	0.1533	0.1386	0.1770	0.1350	0.1421
F-statistic	4.10***	4.63***	4.98***	4.45***	5.11***	6.91***	6.16***	7.76***	4.31***	6.30***	10.36***	8.68***	14.41***	8.54***	10.54***
	(0.0062)	(0.000)	(0.001)	(0.003)	(0.001)	(0.000)	(0.000)	(0.000)	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
KP LM statistic											30.667***	22.860***	45.353***	35.551***	28.811***
Hansen J Statistic											0.1569	0.1659	0.1567	0.1441	0.1576
Observations	592	592	592	592	592	592	592	592	592	592	566	566	566	566	566

Source: Authors' computation.

Note: ***, ** and * represents statistical significance at 1 percent, 5 percent and 10 percent. Probability values are in parenthesis. KP LM test is the Kleibergen-Paap rk LM statistics.

Table 4: Impact of Democracy on Secondary School Enrolment in Africa

	FE					DK-FE					IV-FE				
Constant	-1.1049	-1.1074	-1.1135	-1.1552	-1.1284	-1.1049***	-1.1074***	-1.1135***	-1.1552***	-1.1284***	-	-	-	-	-
	(0.130)	(0.124)	(0.116)	(0.109)	(0.112)	(0.007)	(0.007)	(0.005)	(0.005)	(0.005)					
GDP	0.2177**	0.2215**	0.2154**	0.2279**	0.2161**	0.2177***	0.2215***	0.2154***	0.2279***	0.2161***	0.3752***	0.3803***	0.3711***	0.3850***	0.3736***
	(0.034)	(0.030)	(0.034)	(0.026)	(0.034)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Unem	-0.0135**	-0.0138**	-0.0125**	-0.0141**	-0.0129**	-0.0135***	-0.0138***	-0.0125***	-0.0141***	-0.0129***	-0.0079***	-0.0084***	-0.0073**	-0.0084***	-0.0075**
	(0.015)	(0.014)	(0.021)	(0.013)	(0.023)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.017)	(0.004)	(0.015)
Expenditure	0.0017	0.0016	0.0017	0.0022	0.0015	0.0017	0.0016	0.0017	0.0022	0.0015	0.0011	0.0010	0.0011	0.0016	0.0009
	(0.570)	(0.591)	(0.568)	(0.413)	(0.615)	(0.248)	(0.272)	(0.248)	(0.169)	(0.290)	(0.491)	(0.507)	(0.474)	(0.313)	(0.544)
Elect	0.2364**					0.2364**					0.1839*				
	(0.017)					(0.017)					(0.071)				
Lib		0.2629*					0.2629**					0.1579			
		(0.082)					(0.013)					(0.168)			
Part			0.4484**					0.4484**					0.3526**		
			(0.018)					(0.014)					(0.014)		
Del				0.1402					0.1402					0.1276	
				(0.353)					(0.158)					(0.207)	
Egal					0.4312*					0.4312**					0.3119*
					(0.066)					(0.015)					(0.064)
R^2	0.3674	0.3640	0.3771	0.3568	0.3717	0.3674	0.3640	0.3771	0.3568	0.3717	0.4943	0.4932	0.4953	0.4907	0.4947
F-statistic	21.52***	24.12***	20.29***	15.71***	23.85***	31.95***	45.38***	41.86***	37.02***	46.25***	57.17***	55.67***	60.76***	56.42***	55.64***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
KP LM statistic											19.358***	11.593**	27.948***	23.404***	16.593***
											(0.0007)	(0.0206)	(0.000)	(0.0001)	(0.0023)

Hansen J Statistic											0.8488	0.8627	0.9015	0.8088	0.8503
Observations	435	435	435	435	435	435	435	435	435	435	411	411	411	411	411

Source: Authors' computation.

Note: ***, ** and * represents statistical significance at 1 percent, 5 percent and 10 percent levels. Probability values are in parenthesis. KP LM test is the Kleibergen-Paap rk LM statistics.

Table 5: Impact of Democracy on Tertiary School Enrolment in Africa

	FE					DK-FE					IV-FE				
Constant	-1.2204***	-1.2171***	-1.2195***	-1.2108***	-1.2197***	-1.2204***	-1.2171***	-1.2195***	-1.2108***	-1.2197***	-	-	-	-	-
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)					
GDP	0.1887***	0.1888***	0.1890***	0.1948***	0.1864***	0.1887***	0.1888***	0.1890***	0.1948***	0.1864***	0.1899***	0.1895***	0.1899***	0.1929***	0.1855***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Unem	-0.0026	-0.0027	-0.0025	-0.0028	-0.0024	-0.0026**	-0.0027**	-0.0024**	-0.0028**	-0.0024**	-0.0037**	-0.0038**	-0.0037**	-0.0038**	-0.0036**
	(0.345)	(0.336)	(0.367)	(0.242)	(0.385)	(0.012)	(0.010)	(0.019)	(0.016)	(0.013)	(0.025)	(0.000)	(0.026)	(0.016)	(0.041)
Expenditure	-0.0007	-0.0007	-0.0007	-0.0009	-0.0007	-0.0007*	-0.0007*	-0.0007**	-0.0009**	-0.0007**	-0.0008	-0.0008	-0.0008	-0.0009	-0.0008
	(0.509)	(0.503)	(0.484)	(0.388)	(0.494)	(0.051)	(0.049)	(0.041)	(0.024)	(0.045)	(0.154)	(0.161)	(0.147)	(0.109)	(0.156)
Elect	0.0494					0.0494*					0.0275				
	(0.204)					(0.067)					(0.328)				
Lib		0.0582					0.0582*					0.0435			
		(0.216)					(0.068)					(0.170)			
Part			0.0680					0.0680*					0.0394		
			(0.327)					(0.094)					(0.381)		
Del				-0.0405					-0.0405					-0.0183	
				(0.301)					(0.335)					(0.636)	
Egal					0.1151**					0.1151**					0.1230***
					(0.039)					(0.026)					(0.008)
R^2	0.5951	0.5948	0.5943	0.5945	0.5994	0.5951	0.5948	0.5943	0.5945	0.5994	0.5596	0.5603	0.5594	0.5600	0.5634
F-statistic	9.75***	10.17***	9.17***	9.99***	12.14***	120.03***	146.32***	136.86***	140.06***	147.03***	44.60***	46.46***	43.83***	27.893***	47.46***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
KP LM statistic											32.596***	28.125***	37.610***	27.893***	38.027***
											(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Hansen J Statistic											0.1460	0.2202	0.2489	0.1502	0.1999
Observations	463	463	463	463	463	463	463	463	463	463	444	444	444	444	444

Source: Authors' computation.

Note: ***, ** and * represents statistical significance at 1 percent, 5 percent and 10 percent levels. Probability values are in parenthesis. KP LM test is the Kleibergen-Paap rk LM statistics.

Table 6: Impact of Democracy on Lifelong Learning Index in Africa

	FE					DK-FE					IV-FE				
Constant	-6.0917*	-5.9329*	-6.0045**	-6.3522**	-6.0590*	-6.0917***	-5.9329***	-6.0045***	-6.3522***	-6.0590***	-	-	-	-	-
	(0.053)	(0.069)	(0.044)	(0.046)	(0.063)	(0.005)	(0.008)	(0.004)	(0.006)	(0.006)					
GDP	0.6803	0.7248	0.6250	0.7486*	0.6921	0.6803**	0.7248**	0.6250**	0.7486***	0.6921**	0.9330***	1.0187***	0.8416***	1.0130***	0.9513***
	(0.124)	(0.104)	(0.138)	(0.085)	(0.124)	(0.020)	(0.016)	(0.026)	(0.008)	(0.020)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Unem	0.0164	0.0101	0.0287	0.0093	0.0151	0.0164	0.0101	0.0287*	0.0093	0.0151	0.0275	0.0185	0.0426	0.0195	0.0248
	(0.572)	(0.756)	(0.256)	(0.775)	(0.621)	(0.261)	(0.442)	(0.057)	(0.481)	(0.286)	(0.111)	(0.276)	(0.177)	(0.248)	(0.152)
Expenditure	0.0369**	0.0364**	0.0355**	0.0396***	0.0359***	0.0369***	0.0364***	0.0355***	0.0396***	0.0359***	0.0427***	0.0412***	0.0383***	0.0464***	0.0420***
	(0.024)	(0.024)	(0.030)	(0.007)	(0.007)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
Elect	1.5820**					1.5820**					1.4137**				
	(0.042)					(0.025)					(0.030)				
Lib		0.9891*					0.9891*					0.9668			
		(0.085)					(0.090)					(0.178)			
Part			3.4006**					3.4006***					3.4888***		
			(0.014)					(0.006)					(0.003)		
Del				0.8973					0.8973					1.0477*	
				(0.149)					(0.104)					(0.051)	
Egal					1.9451**					1.9451**					1.6746*
					(0.020)					(0.037)					(0.052)
R^2	0.2459	0.2086	0.2901	0.2118	0.2247	0.2459	0.2086	0.2901	0.2118	0.2247	0.3364	0.3306	0.3361	0.3315	0.3339
F-statistic	3.02**	3.25	3.71**	4.93**	3.22**	16.86***	12.54***	18.70***	9.45***	15.41***	11.78***	12.23***	11.84***	14.08***	11.982**
	(0.0288)	(0.0214)	(0.011)	(0.002)	(0.022)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.017)
KP LM statistic											12.650**	6.072**	13.116***	13.998***	11.982**
											(0.013)	(0.048)	(0.004)	(0.007)	(0.017)
Hansen J Statistic											0.6113	0.4191	0.3235	0.7472	0.6898
Observations	316	316	316	316	316	316	316	316	316	316	299	304	292	299	299

Source: Authors' computation.

Note: ***, ** and * represents statistical significance at 1 percent, 5 percent and 10 percent levels. Probability values are in parenthesis. KP LM test is the Kleibergen-Paap rk LM statistics.

Table 7: Impact of Democracy Index on Lifelong Learning in Africa

	Primary School Enrolment			**Secondary School Enrolment**			**Tertiary School Enrolment**			**Lifelong Learning Index**		
	FE	DK-FE	IV-FE	FE	DK-FE	IV-FE	FE	DK-FE	IV-FE	FE	DK-FE	IV-FE
Constant	0.6724	0.6724	-	-1.0359	-1.0392**	-	-	-1.2013***	-	-5.6638*	-5.6638**	-
	(0.357)	(0.198)		(0.156)	(0.014)		1.2013***	(0.000)		(0.082)	(0.013)	
							(0.000)					
GDP	0.0295	0.0295	0.1276**	0.2215**	0.2215***	0.3803***	0.1888***	0.1888***	0.1895***	0.7248	0.7248**	1.0032***
	(0.767)	(0.669)	(0.032)	(0.030)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.104)	(0.016)	(0.000)
Unem	-0.0063	-0.0063**	-0.0015	-0.0138**	-	-	-0.0027	-0.0027**	-0.0038**	0.0101	0.0101	0.0227
	(0.403)	(0.030)	(0.694)	(0.014)	0.0138***	0.0084***	(0.336)	(0.010)	(0.023)	(0.756)	(0.442)	(0.239)
					(0.000)	(0.004)						
Expenditure	0.0086**	0.0086***	0.0084***	0.0016	0.0016	0.0010	-0.0007	-0.0007**	-0.0008	0.0364**	0.0364***	0.0423***
	(0.012)	(0.000)	(0.000)	(0.591)	(0.272)	(0.507)	(0.503)	(0.049)	(0.161)	(0.024)	(0.000)	(0.000)
Democracy Index	0.0734**	0.0734***	0.0797**	0.0488*	0.0488**	0.0293	0.0108	0.0108*	0.0080	0.1836*	0.1836*	0.1238
	(0.042)	(0.002)	(0.016)	(0.082)	(0.013)	(0.168)	(0.216)	(0.068)	(0.170)	(0.085)	(0.090)	(0.207)
R^2	0.0960	0.0960	0.1386	0.3640	0.3640	0.4932	0.5948	0.5948	0.5603	0.2086	0.2086	0.3247
F-statistic	4.63***		8.68***	26.12***	45.38***	55.67**	10.17***	146.32***	46.46***	3.25**	12.54***	13.20***
	(0.003)		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		(0.0214)	(0.000)	(0.000)
KP LM statistic			22.860***			11.593**			28.125***			8.523**
			(0.000)			(0.020)			(0.000)			(0.036)
Hansen J Statistic			0.1659			0.8627			0.2202			0.7968
Observations	592	592	566	435	435	411	463	463	444	316	316	299

Source: Authors' computation.

Note: ***, ** and * represents statistical significance at 1 percent, 5 percent and 10 percent levels. Probability values are in parenthesis. KP LM test is the Kleibergen-Paap rk LM statistics.

In Table 4, the study reveals that all the indicators of democracy significantly improve secondary school enrolment except for deliberative democracy, which is found to be insignificant. After endogeneity has been accounted for, liberal democracy also becomes insignificant. The positive and significant relationship between democracy and secondary school enrolment has also been revealed in the studies of Anyanwu and Erhijakpor (2007) and Edenbrandt (2010). Participatory democracy is seen to be the most effective form of democracy in propping up secondary school enrolment in Africa, as it is for primary school enrolment. Furthermore, the study finds that GDP significantly boosts secondary school enrolment in Africa while unemployment significantly reduces secondary school enrollment. The study does not find any significant link between government expenditure on education and gross secondary school enrolment in Africa. The influence of GDP on secondary school enrolment is based on the intuition that as the economy grows, there is an improvement in the standard of living, which can lead to an improvement in education enrolments. Similarly, a rising adult unemployment rate can result in a fall in the secondary school enrolment rate of children due to a lack of income and children substituting schooling for work to support their families.

In Table 5, the results revealed a positive relationship between democracy and tertiary school enrolment. However, the study finds differing results across the models in terms of statistical significance. Furthermore, the results reveal that egalitarian democracy significantly spurs tertiary school enrolment in Africa, revealing the importance of protecting individual rights and freedoms across social groups and equal access to power across groups, genders, and socioeconomic classes, in addition to equal access to resources. The studies by Palmisano, Biagi and Peragine (2021), Kromydas (2017), and Gegel, Lebedeva, and Frolova (2015) have revealed the importance of social equality on higher education enrolments. Further findings are revealed in Table 6 and Table 7. In Table 6, the impact of the indicators of democracy on the lifelong learning index in Africa is examined. It is found that in the FE model, all democratic quality indicators have positive and significant influences on lifelong learning in Africa, except for deliberative democracy. This finding is also true for the FE-DK model. However, the result of the IV-FE model shows deliberative democracy to be significant in improving lifelong learning in Africa. Additionally, it was revealed that liberal democracy plays an insignificant role in spurring lifelong learning in Africa. In Table 7, the relationship between lifelong learning and its

components and total democracy is examined. The study finds total democracy to be significant in spurring primary school enrolment across the estimation procedures. The study also reveals that total democracy increases secondary school enrolment and the lifelong learning index in the FE and FE-DK models. However, after accounting for endogeneity, the study does not find total democracy to significantly influence secondary school enrolment, tertiary school enrolment, or the lifelong learning index. Further results show that GDP and government expenditure are significant in spurring lifelong learning in the presence of endogeneity.

5. Conclusion and future research directions

This study has examined the impact of democracy on lifelong learning in 52 African countries utilizing the FE model with heteroskedastic-consistent standard error, the FE-DK model with heteroskedastic, serial correlation, and cross-sectional dependence consistent standard error, and the IV-FE model, which accounts for endogeneity, heteroskedasticity, and serial correlation, for the period 1990 to 2020 in an unbalanced panel data framework. The study utilized six indicators of democracy and four indicators of education, with the results revealing the importance of democracy to improving lifelong learning in Africa. In particular, the study finds that the indicators of democracy are key drivers of primary school enrolment in Africa. Furthermore, it was revealed that improving electoral, participatory, and egalitarian democracy enhances secondary school enrolment in Africa. The study additionally finds egalitarian democracy to be robust for the improvement of tertiary school enrolment. Our findings also revealed that all forms of democracy are good for the overall improvement in education in Africa, except for liberal democracy, when endogeneity is accounted for. Total democracy is further seen to enhance primary school enrolment in Africa. The results also show the importance of economic growth and government expenditure on lifelong learning in Africa. Further findings show the need to provide policies that see a reduction in unemployment for there to be an improvement in secondary school enrolment in Africa.

The findings obviously leave room for future research directions, especially as it pertains to assessing the importance of democratic dynamics on inclusive and sustainable development outcomes in the context of sustainable development goals (SDGs). Moreover, considering country-specific studies for more targeted or country-specific policies is worthwhile.

Conclusively, the study has revealed the importance of democracy in improving educational outcomes in Africa, which can aid in improving socioeconomic outcomes through positive spillover effects.

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Appendix

Table A1: Summary Statistics

	Observations	Mean	Standard Deviation	Minimum	Maximum
PSE	1,236	93.805	26.051	21.708	156.404
SSE	921	42.244	25.645	5.220	115.956
TSE	905	8.881	9.902	0	60.497
Elect	1,608	0.391	0.195	0.067	0.84
Lib	1,608	0.272	0.185	0.005	0.73
Party	1,608	0.229	0.129	0.008	0.545
Del	1,612	0.544	0.240	0.037	0.982
Egal	1,608	0.271	0.148	0.045	0.698
GDP	1,527	2107.153	2581.661	204.024	16,438.64
Unem	1,485	8.755	7.486	0.3	37.97
Expenditure	784	16.647	5.673	2.915	37.520

Source: Authors' computation.

Table A2: Principal Component Analysis of Democracy Index and Lifelong Learning Index

Principal Component	Democracy Index			Lifelong Learning Index		
	Eigenvalue	Proportion	Cumulative	Eigenvalue	Proportion	Cumulative
First PC	4.4835	0.8967	0.8967	2.0792	0.6931	0.6931
Second PC	0.3464	0.0693	0.9660	0.7694	0.2565	0.9496
Third PC	0.0978	0.0196	0.9856	0.1513	0.0504	1.0000
Fourth PC	0.0402	0.0080	0.9936	-	-	-
Fifth PC	0.0319	0.0064	1.0000	-	-	-

Source: Authors' computation.

Table A3: List of Countries

Algeria	Cameroon	Djibouti	Gambia	Libya	Mozambique	Seychelles	Uganda
Angola	CAF	Egypt	Ghana	Madagascar	Namibia	Sierra Leone	Zambia
Benin	Chad	Eritrea	Guinea	Malawi	Niger	South Africa	Zimbabwe
Botswana	Comoros	Equatorial Guinea	Guinea-Bissau	Mali	Nigeria	Sudan	
Burkina Faso	Congo DR	Eswatini	Kenya	Mauritania	Rwanda	Tanzania	
Burundi	Congo Rep	Ethiopia	Lesotho	Mauritius	Sao Tome	Togo	
Cabo Verde	Cote d'Ivoire	Gabon	Liberia	Morocco	Senegal	Tunisia	

Source: Authors' compilation.