Building Businesses Back Better amid COVID-19 Pandemic in Africa

Gbadebo Odularu
Non-Resident Senior Fellow, Center for the Study of the Economies of Africa (CSEA), Abuja, Nigeria.
Research Associate, Centre for the Research on Political Economy (CREPOL), Dakar, Senegal.
Department of Economics, Bay Atlantic University (BAU), 1510 H. St, N.W., Washington D.C., USA.
Trade and Digitization Specialist, Socioeconomic Research and Applications (SERAP), Washington D.C., USA.

1. Introduction

The year 2020 started with a brighter global economy partly due to the partial trade deal reached by the United States and China. In addition, the International Monetary Fund earlier forecasts revealed that the global gross domestic product (GDP) would expand by 3.3% (World Economic Outlook, 2020). Considering the adverse impact of COVID-19 pandemic on the global crude oil price and demand, Nigeria's oil sector suffered immensely from staggering production levels with negative implications on government finances and retarded overall business and economic growth. Suddenly, the Corona-virus 2019 (COVID-19) dampened the global economic outlook such that the Nigerian economy was hit by twin crisis of health shocks and pandemic-induced decline in crude oil prices, thereby resulting in a projected -4.3% contraction in 2020 (IMF, 2020).

As the post-COVID-19 global economy evolves in a seemingly unstable business ecosystem, trade, investment, industrial and production policies...
become more unpredictable in realizing the UN SDGs 2030. There is no doubt in the fact that one of the apparent repercussions of the COVID-19 pandemic include inter alia reduced capacities of public health systems, almost collapsing agri-food systems, inadequate capacities of informal micro, small and medium scale businesses, disruptions in national, regional, and global trade systems, with special reference to intra-African trade and investment relations, especially in public health items, medical supplies, medicines, and pharmaceuticals.

Prior to COVID-19 outbreak, the Nigerian economy showed a fragility sign of 10 out of 46, compared to the year 2019, in which 16 out of 46 sectors recorded growth of less than 2%. Among agriculture, manufacturing and services sector, the latter remained the largest sector accounting for about 52.6% of GDP (NESG, 2020)

However, evidences have revealed that one of the resilient roads to socioeconomic shocks recoveries is strengthening digital trade and e-commerce capacities of micro, small and medium enterprise (MSMEs) as well as supply chain networks from the effects of the COVID-19 pandemic. In other words, how African countries, and governments endeavour to lay a solid foundation for a strong socioeconomic recovery across households, businesses and communities is crucial during and after the COVID-19 era.

This research analyses the effects of COVID-19 pandemic on micro, small and medium business activities, and its implications for how to be better prepared for possible future socioeconomic shocks, and the geopolitical repercussion for African governments.

2. Impact of COVID-19 Pandemic Related Challenges faced by MSMEs

Concerted efforts to stem the spread of COVID-19 has resulted in widespread movement restrictions and shutdown of industrial activities. Five countries – China, Germany, Ireland, Switzerland and the U.S – account for half of the world exports of medical products such as gloves, masks with filters, disinfectants, while African, South America and the
Pacific export a significant share of inputs for these products (ITC, 2020). The situation suggests opportunities for the restructuring of the regional and supply chains towards diversification of the global supply of such commodities. One of the COVID-19 related effects of the Chinese, EU and the US factories shutdowns are the economic shocks being experienced by African exporters are set to at more than $2.4 billion losses in global industrial supply chain exports. By implication, reduced demand due to firms not paying suppliers or canceling existing contracts, often cause significant hardship on businesses, thereby endangering livelihoods.

According to an International Trade Centre (ITC) survey on SMEs Competitiveness Outlook 2020, more than half of firms say that they have problems with accessing production resources such as raw materials and equipment due to lock downs in other countries. More specifically, this also results in slower certification processes, temporary trade measures and other similar logistics problems.

Businesses, including MSMEs, remain the backbone of most economies, more especially in the post-COVID era. According to the Central Bank of Nigeria (CBN), SMEs make up over 86% of the Nigerian workforce and form a crucial part of the private sector ecosystem. Since the COVID-19 pandemic compelled African governments to enforce economic lockdown and social distancing, this has undermined SMEs capacities to operate, generate revenues, meet short-term cash obligations and household’s consumption needs. In fact, most of the SMEs experienced mounting cost pressures, inability to pay salaries and potential business liquidation. At the micro-firm level, the spread of the coronavirus (COVID-19) had a devastating impact on small businesses, which has led to a growing level of concern among small business owners. Among the challenges faced by African MSMEs are price fluctuations, production uncertainty and business discontinuity or unsustainability. Both interview and questionnaire administering methods were adopted to collect and document these COVID-19 related business challenges. Based on the data collected through these methods, Figure 1.0 presents the information on age, occupation, education, business location, age of business, types of businesses, and MSMEs’ capacities to deploy digitization tools for overcoming business challenges that are attributable to COVID-19 pandemic. 94.3 per cent of the respondents are within the working age population (25 – 54 years of
age), and 51.1 per cent of the respondents have tertiary education (diploma and bachelor), while about 47 per cent possess either a Masters or doctoral degree. 53 percent of the respondents have their businesses geographically located in urban spaces, and approximately 97 per cent of the businesses are characterized by MSMEs sizes with less than fifteen years lifespan. Furthermore and as the unprecedented COVID-19 pandemic evolves, 87 per cent of the businesses offer services and will continually deploy simple digital tools in accessing domestic and global markets. Consequently, enterprises, industries, and countries are investing in digitalization tools and capacities as strategic priorities. In other words, as African micro, small and medium enterprises contribute arithmetically to national and continental socioeconomic transformation, its achievements have not been without capacities challenges, such that businesses are characterized by inadequate capacities in upskilling, shocks absorption, preparedness plans and negotiations capacities in response to the rapidly digitalizing global landscape amid COVID-19 outbreak.

Figure 1.
Descriptive Statistics on African Small Businesses Responses to COVID-19 Pandemic

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mode</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of respondents</td>
<td>25 – 54</td>
<td>94.3%</td>
</tr>
<tr>
<td>Gender of business owner</td>
<td>Male</td>
<td>59.1%</td>
</tr>
<tr>
<td>Business owner level of education</td>
<td>Tertiary (diploma and bachelor)</td>
<td>51.1%</td>
</tr>
<tr>
<td>Business category</td>
<td>MSMEs</td>
<td>97.2%</td>
</tr>
</tbody>
</table>

2. Operationally at the Nigerian national level, ‘working age’ means economically active members of a population, which is 15 – 64 years. However, this questionnaire was designed to capture business owners within the prime age 25 – 64 years due to the fact that 15 years old might be too young to register and operate a business in Africa.

3. The service sector, which accounts for over 50% of the GDP of most of Africa’s regional economies, is projected to be negatively impacted by COVID-19, and worsened by travel bans, as well as disruption to transport, distribution, entertainment, trade, retail, creative sectors, hotels and restaurants (AfDB’s Southern Africa’s Economic Outlook 2020). Based on this background, the provision of an enabling business ecosystem will enable MSMEs to effectively deploy digital technologies to advance business agenda during socioeconomic shocks like the ongoing COVID-19 outbreak.

4. For all SSA economies, except the low-income economies, the impact of COVID-19 is seemingly resulting in increase in the amount of services as a percent of GDP, therefore moving towards a services economy. Two of the major driving factors for this global restructuring are digitalization and as ‘servicification’ or ‘servitization’ of the global economy, especially as demand for services expands as income rises in emerging economies such as China, India, crude oil driven economies and selected African countries. The Fourth Industrial Revolution (Industry 4.0) and its profound socio-economic implications purport seemingly limitless trade-in-services, investment, and industrial opportunities across national borders.
In spite of the fact that about 87% of the businesses adopt digital tools to access markets before and during COVID-19 pandemic, it is incredible that a mere 37% believes in the contribution of the African Continental Free Trade Area (AfCFTA) in enhancing domestic and regional markets access (See Figure 2.0). By implication, digitization is more than an innovative pathway to opening the doorways of inclusive development, it is the most effective tool for bringing business back better and more dynamically in the post-COVID era as well as in the implementation of the African Continental Free Trade Area (AfCFTA) (Odularu, 2020a, Odularu, 2020b; Odularu, 2020c, Odularu, et al. 2020; Odularu G., Aluko O.A., Odularu A., Akokuwebe M., Adedugbe A., 2020; McKinsey & Company, 2020; Ali, 2019; Odularu and Alege, 2019).

**Figure 2.**
**MSMEs Confidence in African Regional Market Access**

How confident are you that domestic and African market will meet your business needs (1-most confident; 4-not confident)?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>67 (38.1%)</td>
<td>49 (27.8%)</td>
<td>40 (22.7%)</td>
<td>20 (11.4%)</td>
</tr>
</tbody>
</table>

Sources: Author’s Survey and interview with selected MSMEs.
The COVID-19 pandemic has adversely impacted on Nigerian and African MSMEs as a significant number of the enterprises suffered due to the shock. The global pandemic (COVID-19) also impacts commodities supply chain in Nigeria and Africa. The cost of input skyrocketed immediately, and the reason is attributed to the lockdown, although there is free movement of essential services which agricultural commodities are part of. The lockdown increases the cost of moving inputs from one location to another. Off takers also reduce the purchasing price from farm due to the lockdown as an excuse that they may hold the stock longer than it used to be and they will incur additional cost while holding it, coupled with the cost they will incur during transportation. Farmers not knowing the extent at which the lockdown will take, start selling their produce so as not to incur additional cost.

According to the focus group interviews with selected business owners, the challenges confronting African MSMEs during the unprecedented COVID-19 pandemic are funds, skills, business capacities and infrastructure related. Since the commencement of the lockdown, economic activities have declined. Businesses have been forced to momentarily close shops. Some commercial banks did not initially suspend the monthly debits for loan repayments (interest and principal). Consequently, there has been a reduction in revenues projections and sales because patronage dropped as individual customers are not prepared for spending so much in a lockdown. Since purchasing power is low, even if restrictions are stopped, sales might not drastically improve as salary cuts, increased expenses in health, data service, increased prices for food, etc. will come to bare. As a result, some facilities keep accumulating interest and principal without taking into cognizance the attendant effects of the lockdown which has spanned for five (5) consecutive weeks. For instance, an import-dependent business experienced an unexpected rise in exchange rates account as the major cause of capital erosion which adversely affects the settlement of matured foreign obligations. Quite a number of the MSMEs applied for government loans but never got a feedback or received got a negative response at a delayed time. Many MSMEs claim that early and expedient access to credit facilities and tax holidays will enhance their businesses’ capacities to absorb the COVID-19 shocks and also accelerate their post-covid-19 socioeconomic

---

5. Settlement of foreign obligations occurs when a company have signed a Memorandum of Understanding (MOU) with his foreign manufacturers or suppliers to produce or supply product(s) at a mutually agreed exchange rate at a specific maturity date,
recovery. These MSMEs’ challenges become more complicated because government loan agencies barely meet 10% of the total loans and credit facility needs of the MSMEs.


COVID-19 has temporarily undermined daily business and socio-economic activities in African communities. Facilitating business and economic recovering in a post-COVID-19 world require a ready-to-go strategy. As businesses re-open, most of them will be confronted with a new normal that need to implement a more systems thinking strategy which will require governments, CSOs and relevant stakeholders leverage of relevant digital tools for business re-engineering and transformation. Critical re-analysis of the COVID-19 outbreak related challenges and dynamics being faced by these small businesses and with specific focus on digital trade related connectivity infrastructure is very crucial.

3.1. National Policy Support Interventions

The sudden appearance of the COVID-19 pandemic in the first quarter of the year 2020 has forced many African governments to implement policies and programs. More specifically, the Nigerian government imposed national level business lockdown, social distancing and travel restrictions. Though based on the survey, Nigerian SMEs in are yet to benefit maximally from meaningful supporting actions from the government, which continues to cause a great deal of fear and uncertainty. In other words, SMEs are disillusioned by the Government’s intervention stating that previous loans have been difficult to access. This categorization of these challenges has elicited mixed reactions by business owners bordering on clear-cut strategies to protect their businesses in the wake of the COVID-19 pandemic. In response to cushioning the effects of these challenges, some of the government interventions and palliative measures aimed at

---

6. According to the Central Bank of Nigeria (CBN), a Small and Medium Enterprise (SME) is a company that employs from 11 to 100 people and has assets between N5 and N500 million.
ameliorating the adverse effects of COVID-19 on MSMEs are presented in Table 1.0. These palliative measures are presented in Table 1.0 based on specific types and categorization such as subsidies, tax exemption, credit facility, and the providers of these stimulus packages. According to Table 1.0, and in terms of provision of COVID-19 shock supports, the federal government is the biggest donor during the pandemic and most of these interventions were in the form of credit facilities.

Table 1.
Types of Fiscal Interventions and Stimulus Packages implemented during COVID-19 Pandemic

<table>
<thead>
<tr>
<th>Subsidies/ Tax exemption</th>
<th>MSMEs Incentives</th>
<th>Credit facilities</th>
<th>Others – trade policies, laws, etc</th>
<th>Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subsidies/ Tax exemption</td>
<td>Federal Government / Corporate Affairs Commission (FG/CAC) approval of 250,000 free business names registration for micro, small and medium enterprises across all the 36 states of the federation. More specifically, it implies free registration of 6,606 business names in each of the 34 states while Abia, Lagos and Kano will have 7,906, 9084 AND 8406 freely registered businesses respectively as part of Government’s post COVID-19 Pandemic survival intervention. Selected aggregators were approved to receive applications from interested persons in alignment with CAC requirements - <a href="https://www.cac.gov.ng/wp-content/uploads/2020/10/AGGREGATORS.pdf">https://www.cac.gov.ng/wp-content/uploads/2020/10/AGGREGATORS.pdf</a></td>
<td>Registration portal for the N75 Billion Nigerian Youth Investment Fund (NYIF), thereby paving the way for Nigerian youths to access between N250,000 to N5,000,000, with working capital loans set at 1 year, and term loans set at 3 years. Youth between the ages of 16 and 35 years old with business ideas that require funding apply for the fund through the following link: <a href="https://nyif.nmfb.com.ng/Applicants/New">https://nyif.nmfb.com.ng/Applicants/New</a></td>
<td>Among African countries, it is important to note that Nigeria’s new non-tariff policies discourage imports of the following commodities: COVID-19 test kits, disinfectants, medical consumables, protective garments. However, this incentivized indigenous firms to produce these commodities in order to meet growing national demand.</td>
<td>Federal Ministry of Industry, Trade and Investment.</td>
</tr>
<tr>
<td>Subsidies/ Tax exemption</td>
<td>MSMEs Incentives</td>
<td>Credit facilities</td>
<td>Others – trade policies, laws, etc</td>
<td>Provider</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-----------------</td>
<td>------------------</td>
<td>---------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Strategic Sectoral Intervention: Small / Micro Enterprises are now completely exempted from corporate taxation.</td>
<td>Establishment of a N50 billion COVID-19 Crisis Intervention Fund to upgrade federal and states healthcare facilities as well as financing the creation of a Special Public Works Program. This facility would be used to provide micro grants of between N3 million and N5 million to up to 16,000 SMEs and no less than 10,000.</td>
<td>Amendment of 2020 Appropriation Act: Revision of benchmark oil price and production for 2020 to US$30/barrel and 1.7mbpd. respectively.</td>
<td>Federal Ministry of Finance, Budget, and National Planning.</td>
<td></td>
</tr>
<tr>
<td>Corporate tax rates for Medium-size Enterprises reviewed downward from 30% to 30%.</td>
<td>The Federal Government Support Fund provision of N102.5 billion for direct interventions in the healthcare sector.</td>
<td>Augmentation of FAAC allocations to States and moratorium on States’ debts: US$150 million from the Nigeria Sovereign Investment Authority (NSIA) Stabilization Fund to support the June 2020 FAAC disbursement.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finance Act, 2019 VAT Exemption List for essential food, medical supplies and other basic items that are critical in the government efforts to address the COVID-19 pandemic.</td>
<td>Enhanced financial support to States for critical healthcare expenditure based on the US$190 million World Bank Regional Disease Surveillance Systems (REISSE) facility which will only be accessed by the Nigeria Centre for Disease Control (NCDC).</td>
<td></td>
<td>The World Bank and Federal Government</td>
<td></td>
</tr>
<tr>
<td>Subsidies/ Tax exemption</td>
<td>MSMEs Incentives</td>
<td>Credit facilities</td>
<td>Others – trade policies, laws, etc</td>
<td>Provider</td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------------</td>
<td>------------------</td>
<td>-----------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td></td>
<td>Waiver of guarantor provision requirement by SMEs and households⁷ that applied for its N50 billion COVID-19 targeted credit facility.</td>
<td>N50 billion ($139 million) COVID-19 Targeted Credit Facility (TCF)</td>
<td>One-year moratorium on CBN intervention facilities</td>
<td>Central Bank of Nigeria</td>
</tr>
<tr>
<td></td>
<td>Reduction of interest rates from 9% to 5% per cent on all CBN intervention facilities through participating Other Financial Institutions (OFIs), Microfinance Banks (MFBs), Primary Mortgage Banks and Institutions, among others.</td>
<td>Maintenance of all policy rates at the current levels prior to COVID-19 pandemic</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Provision of foreign exchange funding to pharmaceutical companies.</td>
<td>Liquidity injection of N3.6 trillion (2.4% of GDP) into the banking system.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Introduction of regulatory restrictions towards restructuring loans in COVID-19 related impacted sectors.</td>
<td>Adjustment of official exchange rate by 15 percentage points.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lagos State Employment Trust Fund (LSETF) provided forbearance on its loans to MSMEs.</td>
<td></td>
<td>Lagos State Government of Nigeria.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Organized private sectors including banks and professional societies.</td>
<td></td>
</tr>
</tbody>
</table>

Source: Author’s compilation

⁷ Based on CBN guidelines, eligible beneficiaries are households with verifiable evidence of livelihood adversely impacted by COVID-19, as well as existing enterprises with verifiable evidence of activities adversely affected because of the COVID-19 pandemic.

⁸ IFC’s COVID-19 fast-track financing support package represents IFC’s commitment to Nigeria’s private sector following the severe challenges. The funds will support hundreds of businesses with trade financing and working capital loans.
In addition to the interventions provided in Table 1.0, other government palliative measures to SMEs are provided. The governments continue to monitor developments and implement appropriate measures to safeguard financial stability as well as support stakeholders impacted by the COVID-19 pandemic.

### 3.2. Regional Policy Support Interventions

African governments need to systematically integrate digitalization in their intra- and inter-continental trade relations as well as adopt more proactive digital trade strategies towards boosting post-COVID-19 trade, business and investment volumes, direction and composition in this digital decade. Of great relevance is the need to understand how digital communication technology, digital infrastructure and information remain critical components of sustainable trade policies towards enhancing socio-economic recovery as well as trade trajectory in Africa. In other words, nationally and regionally customized digital trade programs should include sustainable trade practices, guidelines, recommendations and policy interventions for fostering effective MSMEs business recovery programs and bringing back trade and investment volumes.

Business support organizations and multi-agency platforms like the chamber of commerce, sector associations, trade and investment support institutions and cooperatives should take front roles in bring firms together, matching business opportunities with shared needs through shared knowledge, resources, and procurement, and economies of scale. One of the effective pro-poor, broad-based and inclusive growth policies for enhancing resilience and combating socioeconomic shocks is economic diversification, with reference on commodity-driven industrialization. In addition, the implementation of the African Continental Free Trade Area (AfCFTA) is projected to provide medium- and long-term opportunities for improved and more competitive business ecosystem towards fostering economic growth (Odularu, 2020a, Odularu, 2020b; Odularu, 2020c, Odularu, et al. 2020; Ali, 2019).

As policy response to stem the spread of COVID-19 pandemic and ameliorate its adverse impact on MSMEs, the African Union Commission (AUC)’s interventions focus on the:

---

9. Other COVID-19 government interventions are provided in this link: [https://guardian.ng/business-services/nigeria-support-your-small-and-growing-businesses/](https://guardian.ng/business-services/nigeria-support-your-small-and-growing-businesses/)
• Implementation of the Common African Continental Strategy on the COVID-19 pandemic. Thus, the AUC provided direct funding to strengthen public health systems, resource mobilization as well as development and operation of an AU Trade Corridor aimed at facilitating continued flow of essential goods across borders, required to fight the COVID-19 pandemic.

• Collaboration with Development Partners to establish Technical Committees involving the participation of experts from all AU Member-States with a key focus on implementing a holistic set of measures to mitigate the negative impacts of the COVID-19 Pandemic as well as mobilize international support for Africa’s efforts to combat the pandemic.

• Coordinated capacity building and pooled procurement of pharmaceutical products under the coordination of the African Centers for Disease Control and Prevention (CDC); and,

• Establishing an African Youth Front on the novel coronavirus as an AU framework to be used in engaging young people to come up with youth-led solutions in Africa’s multi-stakeholder efforts to fight the COVID-19 global pandemic.

In addition to those policy measures, the current efforts to operationalize the African Continental Free Trade will contribute greatly to quick economic recovery from this crisis and enhancing MSMEs’ capacities to produce and access markets (Odularu, 2020a, Odularu, 2020b; Odularu, 2020c, Odularu, Hassan and Babatunde. 2020; Ali, 2019). By creating one African market, we are transforming the MSMEs’ landscape to bring in a large market of 1.27 billion people (expected to be 1.7 billion in the next ten years) and large economies of scale and scope which will in turn attract largescale and long-term investments. Arising from this, the basic incentive for businesses operating in the post-COVID-19 AfCFTA ecosystem is that they will face huge and attractive opportunities (Odularu, 2020a, Odularu, 2020b; Odularu, 2020c, Odularu, Hassan and Babatunde. 2020; Ali, 2019).

4. Policy Implications

In addition to the provision of CARES-related stimulus package to MSMEs, an effective strategy to deploy in overcoming this challenge is the establishment of a digital business and trade academy for re-tooling and
re-skilling national MSMEs and trade negotiation training and research capacities in response to the advent of artificial intelligence, big data, internet of things, electronic commerce (e-commerce), electronic stock exchange, and multi-commodity exchange. More specifically, the workable policies for immediately urgent attention by African governments should include inter alia:

- Funding for business with longer tenors and lower interest rates to support and sustain MSME.
- Tax exemption for the business until sales increase to profitability
- Policy that will encourage manufacturers of these raw materials products to reduce the cost of these items during economic shocks.
- As businesses have to source for more funding for renovation, installation, and generation of electricity from financial institutions, these loans would be restructured for longer tenors with lower interest rates.
- The government could buy our products to distribute to school children to assist in their online learning and for those in remote areas without access to internets as part of palliatives for children.

5. Conclusion

In Africa, the rapidly evolving coronavirus diseases 2019 (COVID-19), and weak connectivity and digital infrastructure are placing huge pressure on micro, small and medium enterprises (MSMEs), thereby posing immense challenges to the region’s capacity to achieve the United Nations Sustainable Development Agenda (UNs SDA) 2030. Although SSA boasts vast, human and natural resources, its business and trade capacity to contribute to Africa’s economic transformation agenda is being seriously undermined by factors such as poor adoption and utilization of innovations and digital tools, climate change impact, environmental degradation, weak political will, limited interest in farming, lack of government support, and more. In spite of these constraints, sustainable agriculture, and socio-economic recovery of businesses can be achieved by adopting a multi-pronged approach, which includes inter alia: improved business engineering, increasing systemic digitalization, use of information technology, public investments in improved technologies, and rural infrastructure funding. This research provides innovative policy tools for enhancing SSA’s MSMEs’
capacity to achieve sustainable business transformation in the face of COVID-19 pandemic and other socioeconomic shocks. Furthermore, this article presents smart strategies for increased MSMEs productivity outcomes by harnessing the latest discoveries in digitalization, innovation, research, education and advisory services.
List of References


Winthrop, R and Langford, L. 2018. Can technology help leapfrog education in Africa?