I was working on the final preparations of this manuscript in the middle of COVID-19 pandemic, precisely between the end of March and the beginning of April of 2020. This unprecedented and infamous contagion disrupted every facet of life including of course, the education sector. Interestingly and unplanned as it may be, I found myself “stranded” in the epicenter of the pandemic in New York State in a situation whereby, a one week Spring Break trip turned into a three-month sojourn. I spent the time taking care of business as a professor and graduate program coordinator with numerous virtual meetings, lecturing, advising, grading, and planning a new online graduate program, in addition to other family engagements and responsibilities. Amidst the chaos and uncertainties, learning was not interrupted, all education levels in the United States and in many other developed countries were conducting teaching and learning but in a different format. Even though campuses were closed, schools and universities remained open. I have nieces and nephews in both elementary and high schools—they continued with the planned curriculum—maintaining a schedule, videoconferencing with their teachers and fellow students, completing their assigned work, taking tests, and keeping up with the planned schedule only in a different version—a digitized virtual form. Similarly, in developing countries, several high quality and affluent schools experienced uninterrupted learning through television and radio programs and lectures via school websites and social media.
But then, several challenges abound especially for students who were unable to seamlessly transition online to continue learning. The greatest challenge was an absolute lack of resources to engage in any form of official learning relating to the curriculum; students in this category simply stopped interaction and had no form of instruction with their teachers because it was absolutely impossible to do so. Another level comprised of students who had limited access to learning. This happened in several layers—watching educational programming from public television or listening to educational programming on radio. Others were able to log onto the school websites to download or copy assignments posted by their teachers and completed the assignment, then wait for an opportunity to send them to teachers or wait for their teachers to post the answers online. In some cases, the assignments were not even graded and students received no feedback. Other students engaged in some level of interactivity albeit asynchronously, whereby professor (this is mostly in higher education sector) taped lectures and posted them on class group Whatsapp page for students to watch/listen and engage in chat or discussion via the same mode—Whatsapp. Even in situations where teachers or professors were able to engage students in some form of learning, other extenuating factors mitigated learning. Those factors include lack of electricity or power, lack of Internet connection, lack of conducive environment for learning since some students share a one bedroom apartment with a family of five or even seven. There are also other extreme cases such as Kenya with the decision for schools to remain closed until 2021; subsequently, students will lose one academic year.

As I review my manuscript conscious of this reality, I began to think about my subjects of focus—elementary and high school students in low-income, rural sections of Sub-Saharan Africa. I placed a few telephone calls to colleagues who are educators at primary, secondary, and tertiary levels in several countries in Africa, just to gauge their pulse and gather some unofficial data regarding teaching and learning in COVID-19 era. The results were exactly what I had envisaged—the high quality affluent schools continued with e-learning at home, while the mid-range socio-economic status schools had some level of learning but definitely not with a synchronous interactivity but receiving a list of assigned work, completing them and some students will have a means of getting it to their teachers while others did not. The third category is my main focus—students who, even though their public media systems—radio and television—still these students were unable to benefit from such service
because they had no access to radio and television, or they had no electricity, or other source of energy/power to access the programming. Sadly, many of these students or pupils share textbooks; and with the trend of social distancing were unable to visit a classmate to even review the materials. Also, some students because they share a textbook, can only use the books while in school. But with the shutdown, schools are closed; apparently, so is learning. I began to question the wisdom in proposing a universal education technology. I also began to conjure the best technology that can augment teaching and learning for such population. Also, I wondered the best way we (scholars, educators, parents, policymakers, multilateral/international organizations) could serve this population. Despite the quest for digitization so as to be at par with developed countries, it was clear that to some people, it was impossible for teachers and students to continue teaching and learning in the only alternate mode that COVID-19 allowed—online (digital). African nations are yet to attain the level of digitized learning; and so should not adopt verbatim the development goals as set by multilateral organizations but should adapt first and then adopt as congruent. Amidst the crisis and epidemic of COVID-19, has emerged a reality that illustrated the strengths and weaknesses of each region, nation state and local community as evidenced in how they responded to, and managed life during the crisis. The disparity in access and digital divide is obvious in education sector—while developed nations with all necessary ancillary support for a digital pedagogical mode seamlessly transitioned online and kept to their schedule, several African schools including the tertiary institutions halted their official teaching and learning activities. This reality evokes the following questions and thoughts.

Is Africa ready for a fully digitized learning environment in the elementary and secondary sectors for all children irrespective of their geographic location? To what extent and at what scope and parameter can African elementary and secondary schools effectively and feasibly implement the universally attributed development goals especially the goals focusing on educational technology? How can African nations and multilateral institutions cater to, and incorporate the low-income communities in the universal declaration of development and sustainable goals? The contributions of this volume and the central arguments for this volume can be simply summarized thus:
Technology is not synonymous with digitized devices; any artifact, idea, concept, employed in solving a problem or improving a situation is technology.

Educational technology should not be regarded as digital only; Analog technologies are equally effective.

There is urgent need for reorientation and reframing of the dominant narrative that promotes digital technology in all schools even among the schools that are yet to afford the basic needs such as pencils, pens, desks, and sanitary resources.

Educational technological initiatives in low-income communities or Africa in particular, especially those designed and packaged in Western countries should be thoroughly evaluated before implementation. Such implementation should invoke a participatory action model involving all stakeholders using the proposed model or a variation of it.

Cultural concepts are imperative and should constitute a central argument in the design and implementation together with proper teacher training.

**Self-Reflexivity on Educational Technology**

This volume, to a greater degree has catered to leveraging analog technology in improving teaching and learning among low income communities. Equally, it has catered to revisiting cultural peculiarities of a given region to ascertain to what extent the education being delivered, serve the social and economic development and prepares graduates for the workforce. And so seemingly, the digital educational technology was almost relegated to the back burner and was not promoted as such. It therefore, behooves this volume to equally discuss my perception and engagement with implementation of digital educational technology. I am not advocating for a regression to a stone-age because for full disclosure, and self-reflexivity, I am immersed with digital technology and learning. I am an avid proponent of digital educational technology and I use educational technology heavily in my teaching. I practice constructivist pedagogical approach with experiential learning and application of concepts. In fact, interactivity constitutes the centrality of my teaching; and often, I assign as large as 15% of final grades/overall or cumulative points to active participation. Constructivism and digital technology make learning
exciting. I have tried various digital learning approaches, flipped classrooms whereby I record lectures for students to watch and the class meeting time is used for meaningful discussions, I have employed experiential learning through concept application, role-play, etc., and I have used discussion boards in online teaching both synchronously and asynchronously. All these are proven strategies that instill creativity, increase critical thinking skills, and impact overall teaching and learning. But then, the above strategies work for the population and the region with whom I work. The students can afford the equipment and teachers receive extensive and frequent training to effectively implement such learning tools and strategies. However, this is not feasible universally. Given that a plethora of books are dedicated to showcasing and promoting digital technology and the empirical data supporting the impact of technology in the scholarship of teaching and learning, this volume advocates for, and focuses on that forgotten percentile to whom digital educational technology is impossible.

It should be noted that elementary and secondary schools in Africa and worldwide run along a continuum from the very basic arrangement where teaching and learning are conducted under a tree, to a state-of-the-art affluent options; therefore, global policies on education and education reformation should consider these nuances. The major corollary to this central argument is the need for a conscious reframe of the narrative of education technology, highlighting the epistemic nuances that validated analog technologies as equally capable of achieving the goals whether global or local, if the technologies in question are leveraged efficiently, even in rural communities.

This work by no means subscribes to victimhood or a victimized population that lacks agency whereby Western companies or multilateral institutions compel Africans to adopt educational technology under duress. But, it should equally be known that a certain mentality exists whereby Western products are considered superior to home-grown products in Africa—the example of choosing OLPC Ghana over a computer laboratory option suggested the Ghanaian education ministry is an example. Additionally, suggestions from international organizations are often perceived as ultimate solution to many problems. So, while international or multilateral organizations continue to issue policies on education and developmental and sustainable goals in general, those policies should be considered as templates and suggestions and not mandates in and of themselves. Therefore, those suggestions and prescriptions should be
adopted and implemented as needed and not wholesale. Also, I would like
to further emphasize that while positive impact of educational technology
abound even in empirical data, any technology bereft of local content
or consideration and which fails to align with local curricula becomes a
distraction and a deterrent to achieving the goals of education.

Other final thoughts must highlight proper training in terms of teacher
professional development efforts as inevitable for a successful adoption of
any new program both software and hardware. This reality is universal
even for the digitally-savvy nations. As such lack of proper training for
a new program will always produce a chaotic outcome. A most recent
example of such disaster is the 2020 Democratic Iowa Caucus which
recorded the most chaotic procedure and a very unusable result which
came out over a month after the Caucus. Experts noted that the Iowa
Caucus flopped due to newly introduced technology and subsequent lack
of proper training of staff—and this is for the First World, and a devel-
oped country with established technology advancement. Epstein, Ember,
Gabriel, and Baker (2020) of the New York Times reported:

The fragile edifice of the caucuses, which demoralized Democrats in search
of a strong nominee to take on President Donald Trump, crumbled under
the weight of technology flops, lapses in planning, failed oversight by party
officials, poor training, and a breakdown in communication between paid
party leaders and volunteers out in the field, who had devoted themselves
for months to the nation’s first nominating contest. (Par. 10)

Even in a developed, digitized society, lack of training or proper training
for a new technology has proven to be disastrous. New York Times
Reporters, Leatherby, Gamio, and Collins (2020) provided a list of what
went wrong with the Iowa Caucuses and the top four included: the app
was not adequately tested, the volunteers were unfamiliar with the new
system, the app did not work for everyone, and thus submitting results
was more complicated than usual.

The impact of ICTs in education improvement is incontrovertible.
This has been documented in terms of boosting zeal and enthusiasm,
enhancing creativity, problem solving and providing alternative ways of
handing teaching as well as materials. ICT cannot improve poor teachers
or poor pedagogy or curriculum. On the contrary, it exposes such. For
good teachers and teacher training will address the best ways of incor-
porating ICT. So, decision-making stakeholders should not focus on just
securing the best ICTs but to improve teachers’ skills and attend to other factors that could enhance the achievement of educational goals. The crusade then becomes a call for multilateral organizations, specifically the World Bank and UNESCO to reorient people to see the potential of other tools that could enhance pedagogy. UNESCO, other multilateral institutions, government agencies, etc. should launch a campaign of reorienting all stakeholders that ICT should not be considered only as including computer and the Internet. It is obvious that irrespective of technology deployment and penetration level, there still exists digital divide, the process of diffusion of innovation will always occur at several stages and at different pace. So, for the technology adoption, there will always be laggards, and that does not necessarily indicate learning is not occurring in their own level of diffusion—we simply need to use those forms of technology that suits their situations.

Perhaps a more progressive and efficient perspective might be to refrain from comparative analysis between African countries especially the Sub-Saharan Africa and Western countries like the United States and others. In reviewing several studies, scholars have emphasized the disparity between African nations and the Western world lamenting on how African countries are left behind in the global arena of ICT in education. It is grossly incongruent to compare low-income or even no-income communities of subsistent farmers with affluent communities and berate the schools of not stepping up to the twenty-first-century standard. By no means am I making excuses or praising the status quo in Africa. However, the goal of this project is to unveil the nuances and lend new meaning to the term educational technology or Information and Communication Technology. All technologies do not necessarily have to be digital in order to be effective; in many cases, analog ICT and even technologies that lack the “C” (communication or interactivity) component in them can equally if not better serve low economic regions of the developing world. There is an urgent need to also consider textbooks, Radio, television, mobile telephony, any other technologies that do not necessarily have the 2.0 capabilities.

In the same vein, it is grossly presumptuous to think that only digital technology is what is needed to tackle poverty and improve learning. Reviewing all works on how to effectively implement educational technology, the materials are the same. The cultural aspect of Africa is often ignored. We need to review theoretical foundations established by
reputable educationists such as Piaget, Dewey, Bandura, etc. and how the environment shapes learning.

Having addressed that, it is equally important to address culture in consonance with the argument of education. As such, it is difficult to sieve out African culture from the social framework and treat it as an isolated construct in this work.

**Evaluation as Praxis**

Every formative assessment concludes with a call for action that aims at improving the project assessed. Therefore, this work calls for action to provide a public relations, marketing and rebranding strategy that will convoke reorientation on what it means to infuse technology in education especially at the rudimentary school level. Instead of painting broadly the goals and a quest of ICT4All, a fine brush that recognizes that to some, their most valued and anticipated technology could be access to a textbook and other basic educational needs should be used instead. To others however, it could be owning digital Tablets with uninterrupted Internet connection and a wealth of digitized contents for augmenting pedagogy. Therefore, UNESCO and governmental Agencies, both at the local and national levels,—are called to revise the narrative and acknowledge this diversity and so act accordingly for a desired goal and outcome.

In defining what it means to “prepare our students to compete in a global arena,” globalization is good but becomes questionable when it means only Westernization and losing one’s identity to that of another in the quest to be able to compete in the global arena. The dominant assumption promotes, bringing technology/education to uneducated people; instead of bringing technology to people of different educational systems/methods and finding a balance through best ways to apply their educational system to the technology instead of better way to educate them—this latter statement renders the existing system invalid or ineffective. The caveat though is forcing the new technology into the already condemned system and hegemonically applying it. Meanwhile, there is a huge resistance from both the teachers/educators and then even more severe resistance from the system and environment in general. Instead of condemning it entirely, demonstration of similarities would probably help close the gap (between old and new) and not render the new experience entirely foreign.
While this work presents a few cases as samples, its greatest contribution is providing a praxis-informed perspective through a critical framework that informs (re)evaluating ICT in primary and secondary education in Africa. It is hoped that future editions will provide country-specific information given that Africa is not a monolithic society but very diverse on many fronts—political, educational systems, culture, and language.

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