

Leveraging Massive Open Online Courses (MOOCs) for Increased Access and Quality Education in Nigeria

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Abstract

The growing demand for higher education across the educational landscape in different contexts is impacting research in innovative ideas that may potentially transform the higher education system for increased access and opportunities for quality and affordable education. Massive Open Online Courses (MOOCs) are recent additions in higher education, over the last few years, researchers have predicted MOOC's potential to provide and increase access to quality education to an almost infinite number of people regardless of time, and location. Although MOOCs are not devoid of limitations, this paper argues that it's affordances and immense potentials for scalability and flexibility make it the appropriate tool for the 21st-century transformation of the higher education system, especially in mitigating the challenges of enrolment into the Nigerian university education system.

Keywords: Massive Open Online Courses (MOOCs), Higher Education, Open and Quality Education

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Introduction

Higher education across the globe is affected by several impediments from uncertainty about its role in the society, misalignment of curriculum contents, fragmented functions within universities, sustainability issues and rising costs (Czerniewicz, Deacon, Small, & Walji, 2014). Nevertheless, these issues are more prevalent in resource-constrained communities of the world, especially in Africa. Literature have shown that over 100 million people apply for admission into higher education across the globe annually (Bervell & Umar, 2017), however, only about half the number are enrolled in these institutions, inadequate absorbing capacity, poor infrastructural and technology environment (Mwalumbwe, & Mtebe, 2017; Tulinayo, Ssentume & Najjuma, 2018). These challenges spiked the interests of academics, researchers and institutional leaders in innovative ideas and solutions such as the open educational resources (OER), open learning and massive open online courses (MOOCs).

Over the past decades, there has been growth in higher education across the globe. The British Council in a 2012 survey had predicted significant rise in enrolments across higher education institutions in some low, middle and high-income countries that include Brazil (Nine million), China (37m), Ethiopia (600,000) India (28m), United States of America (20m), Turkey (700,000) and Nigeria (1.4m) (Raphael, 2017). Furthermore, Czerniewicz, et al., (2014) noted that higher education in Africa has witnessed a trend that tripled from 2.7 million in 1991 to 9.3 million in 2006. Consequently, the United Nations Educational, Scientific and Cultural Organisation (UNESCO's) Institute of Statistics (UIS) also reported a significant growth in sub-Saharan Africa's higher education. As Calderon (2018) observed, the subregion recorded an increase in enrolment from 2.4 million (which is 2.6% of the global enrolments) in the year 2000 to 7.4 million (3.4% of the global enrolments) in 2016 (Calderon, 2018). Consequently, the authors predicted a global increase in enrolment from 214.1 million in 2015 to 594.1 million by the year 2040. Table 1 and Figure 1 are the graphical representation of the enrolment trajectory between the year 2000 to 2040.

Region(s)	2000	2005	2010	2015	2016
Arab States	5.1	6.9	8.7	10.7	10.8
Central & Eastern Europe	14	19.5	21.6	19.5	18.9
Central Asia	1.5	2.1	2.2	2.1	2
East Asia & Pacific	25.3	41.3	55.3	69.4	70.9
Latin America & the Caribbean	11.5	16.1	21.6	25.3	26.2
North America & Western Europe	27.8	33.7	37.8	37.5	37.5
South & West Asia	12.2	16.1	28.5	42.2	42.2
Sub-Saharan Africa	2.6	4.1	5.8	7.4	7.4
Global	99.9	139.6	181.5	214.1	215.9

Table 1. Global enrolment in higher education. *Source: Calderon (2018) Massification of Higher Education Revisited.*

Over the last few years, Nigeria has surpassed these projections. For instance, the number of applicants for university enrolment grew 1.5 million to 1.8 million between 2015 and 2018 (Kanyip, 2013) out of which only 30% were admitted affirming this position, the executive secretary of the Nigerian Universities Commission (NUC) reported that only 1.9 million out of over 7.8 million that wrote the university entry examination (JAMB UTME) between the year 2013 to 2017 were admitted (www.tribuneonlineng.com). A clear manifestation of the threat to the realisation of the national higher education objectives, its potential effects on socio-economic growth, the stability of the country and the cardinal objectives of higher education in Nigeria.

Educational objectives that include: (i) national development through high-level workforce training. (ii) development and inculcation of values for the survival of the citizens and the society. (iii) development of the intellectual capability of citizens to understand and appreciate their environments (iv) the acquisition of physical and intellectual skills that enable citizens to be self-reliant and useful members of the society, and (v) the promotion of scholarship and community service. To these ends, Nigeria needs a robust and dynamic educational system that delivers on these collective vision, and empowers the individuals to withstand the threats of poverty and disease. Like most countries in sub-Saharan Africa, Nigeria is bedevilled by poor access to higher education Africa (Kanyip, 2013), budgetary constraints, competing priorities and poor absorbing capacities of the institutions (Yunusa, Umar, & Bervell, 2019). Calderon (2018), reported that participation among the eligible age group in higher education in the African sub-region declined by 2.8% between 2012 to 2016.

Against this background, this paper advocates the adoption of the massive open and online courses (MOOCs) as a panacea to the challenges of access to higher education (especially university education) in Nigeria. The paper draws on the different models adopted in developed contexts's such as Harvard, MIT, Stanford and many others to advance the adoption of MOOCs given that there is an improved internet bandwidth

and penetration in Nigeria. MOOCs are fast becoming household names in the realm of open, distance and online learning environments. Since its emergence over a decade ago, MOOCs has spread across North America, although MOOCs are offered in a wholly online mode, many institutions are increasingly negotiating to use MOOC materials in hybrid or blended format on campus (The British Columbia blog, 2016). However, issues of retention and course completion are pushing the frontiers of knowledge (Cobos & Jurado, 2018; Hone & Said, 2016; Watson, Kim, & Watson, 2016). Other impediments associated with MOOCs include; students use of MOOCs and their learning strategies, motivation and persistence in learning (Hood, Littlejohn, & Milligan, 2015; Jung & Lee, 2018; Zhou, 2016) with little focus on MOOCs adoption and implementation in Sub-saharan Africa .

Over the last few years, two major classifications of MOOCs have emerged xMOOCs and cMOOCs respectively (Smith & Eng, 2013) while different variations of MOOCs models are still evolving though with common features. Bates (2014) identified networked learning as the key features of cMOOCs, this refer to learning developed through connections and discussions in social media space without standard technology platform. Popularly referred to as connectivist MOOCs (cMOOC). On the other hand, xMOOCs is a behaviourist oriented, information transmission model in the form of traditional classroom setting, the differences being that teaching occurs online, by recorded videos of short lectures with computer automated testing and peer assessment.

Researchers such as Yousef, Schroeder, Wosnita and Jakobs (2014) unraveled two other forms of MOOCs, small open online courses (smOOCs) and blended MOOCs with campus-based teaching (blended MOOCs). Relatedly, Chauhan (2014) suggested a broader taxonomy of the MOOC models such as; the Big Open Online Courses (BOOCs) described as the intersection between xMOOCs and cMOOCs, the Distributed Open Collaborative Courses (DOOCs), a MOOC shared by 17 different universities, Little Open Online Courses (LOOCs), Massive Open Online Research (MOORs) which is a blend of video-based lectures and students' research projects guided by instructors. Small Private Online Courses (SPOCs), the Harvard law school model, wherein students offer courses through video lectures delivered as on-campus students enrolled at Harvard and the Synchronous Massive Open Online Courses (SMOCs) which is real time lectures for campus-based students that are also synchronously available to off-campus students for a fee. These are some of the MOOCs variations may be leveraged upon to increase access to quality higher education in underserved and resource constrained communities.

In Africa, the uptake of technology driven education is on the increase due to the huge investments made by governments in the region coupled with the growth of internet occasioned by the expanding undersea optic fiber cable network around the continent (Escher et al., 2014). Nigeria may draw on a few MOOCs projects to improve its higher education for instance: The Rwanda's Partners in Health Project (PIH). In this model, a contextualized MOOC hosted on the Couseira platform by the university of Geneva Titled: Global Health "An Interdisciplinary Overview" was used to train health workers selected from three districts in Rwanda, the course had no pre-requisites while participation was optional, the results show that 20 out of the 38 employees (52.6%) completed the course. 85% of the participants attended 3 out of the 7 sessions. 80% of the participants believed that completing the course helped

advanced their career (Warugba, & Naughton, 2016). In Kenya, Jobe (2013) reported the design and development of a quasi-MOOCs that provided open educational resources (OER) for teaching and learning across the strata of Kenyan educational landscape. The “Kenyan Cloud School” contextualized curriculum contents in English and Kiswahili. It is also combined the learning aspects across different MOOCs format such as structured lectures, interaction and open resources for enhanced quality of teaching and learning.

The World Bank’s New Economy Skills for Africa Program in Information and Communication Technology (NESAP-ICT) in Tanzania (Escher & Noukakis 2014). NESAP-ICT was designed to supplement higher education courses on graduate ICT skills using MOOCs from leading universities. Also, the Kepler project in Rwanda is an independent MOOCs project in Africa with a unique structure of MOOCs designed to meet the of the Rwandan students. Escher et al., (2014b) noted that students who enrolled in the program lived, learned together and received assistance from knowledgeable staff members. It was a wholly independent MOOCs that afford students the opportunity to complete a four-year course of study from top ranking universities.

Barriers to accessible and qualitative education in Nigeria

Previous studies have identified poor or lack of funding, inadequate facilities and lack of access to youth education as factors militating against educational development. According to Garba, (2017); Boga & McGreal, (2014), youth access to education is about 6% in Africa. other limitations are issues of misalignment of curricula with goals of nation-building, and the needs of the society, inadequate and inappropriate staffing, and poor information and communication technology infrastructure such as internet connectivity, unstable electricity and poor internet bandwidth (Bervell & Umar, 2017; Oyo & Kalema, 2014). In sub-Saharan Africa, countries like South Africa, Tanzania, Kenya and Uganda are leveraging the shift from traditional model of education to online (Ng’ambi & Bozalek, 2015; Bervell & Umar, 2017) adopting technology-enhanced educational medium.

Although few universities offer an ODL mode in Nigeria (e.g. the University of Lagos, University of Port Harcourt and Ahmadu Bello University Zaria) most of the universities run a part-time structure based on an ‘inward looking format’. An operational framework that accommodate students within the university. However, this model has minimal impact on the issue of accessibility. In the past decades government in Nigeria have established more universities, from 76 universities in 2010 to 138 universities in 2014 (Jaiyeoba & Ademola, 2014). with corresponding rise in the enrolment numbers, an average of 12% annually (National Universities Commission (2000 as cited in Jaiyeoba, et al., 2014). Figure 1 presents enrolment numbers in Nigerian Universities between 2010 to 2016 (National Bureau of Statistics/JAMB). The figure also illustrates a rise in the number of enrolments.

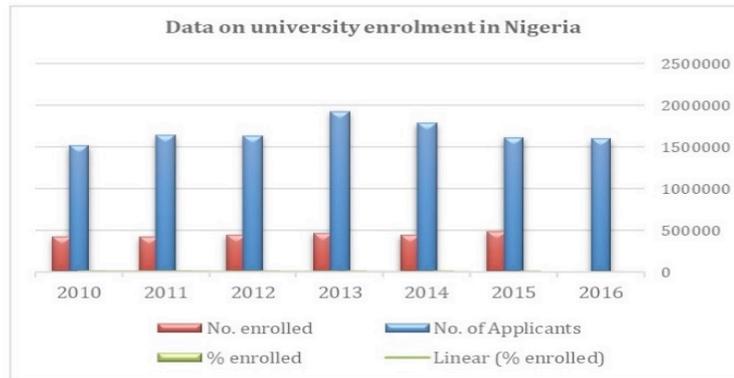


Figure 1. Enrolment figures in Nigerian universities 2010-2016 Source: National Bureau of Statistics, Joint Admission and Matriculation Board

MOOCs as Panacea to the challenges of higher education in Nigeria

The word 'MOOC' was coined in 2008 by Dave Cormier, from the University of Prince Edward Island for a course offered by the University of Manitoba titled; "Connectivism and Connective Knowledge."(CCK08). There were 25 tuition-paying students from the university and 2,300 non-paying students outside the university who took the course online. There were electronic feeds for material and participation was facilitated through a variety of venues including Moodle (which is a Learning Management System), Blog posts, Second Life and real-time online meetings (Ng'ambi & Bozalek, 2015).

In Nigeria, the rising number of citizens seeking university education may be accommodated by MOOCs given its potentials and flexibility. Furthermore, a few tertiary institutions provide a semblance of MOOCs in Nigeria. Institutions like the National Open University of Nigeria (NOUN), Centres for Distance and Continuing Education at Ahmadu Bello University, Zaria (ABU); University of Ibadan (UI), Bayero University Kano (BUK), Kaduna State University (KASU), University of Lagos and University of Port Harcourt offer online courses that help students acquire skills not only beneficial as general education but also assist the learners to startup businesses and additional qualification for career advancement. Experts in the African context have recommended different approaches to improve higher education (Bette & Esu, 2011; Jaiyeoba & Ademola, 2014; Okoli & Azih, 2015; Ofoego & Ebebe, 2016).

However, "leveraging MOOCs" is contextualized based on the challenges of access and enrolments in Nigeria higher education system. The paper is premised on the insights from McAndrew and Scanlon (2013) who noted the significance of MOOCs as a viable alternative in the educational process. With courses enrolling over 100,000 students, MOOCs ability to reach students who have breaks in study, change where they study, mix study with work, and take at least part of their study online. Also, Godwin-Jones (2014) and Stone (2018) noted the increase in MOOCs and other "in-the-moment" learning opportunities represents the need to understand the effective design of the global learning environment which transcend the contents, and include the modes of delivery as well as the environment in which the learner receives the content. The paper also draw on evolving trends of MOOC across the world for inclusion, open, cheap and affordable pathway for growth and development (Albelbisi

et al., 2018; Escher, Noukakis, & Aebischer, 2014; Liyanagunawardena, Adams & Williams, 2013; Muhammad, Mustapha, & Haruna, 2016) despite its inherent problems (Clow, 2013; Sharma & Kawachi, 2017; Sunar, Abdullah, White, & Davis, 2015; Ulrich & Nedelcu, 2015; Yousef, Chatti, Schroeder, & Wosnitza, 2014).

Why Leverage MOOCs?

Leveraging MOOCs is predicated upon its 'massiveness' regarding enrolment, there is virtually no limit to the number that may be admitted, it is open, with flexible admission requirements and little or no tuition, it is online (internet based) could be accessed through mobile. Oyo and Kalema (2014) also noted that developments in MOOCs is focused on course contents with a defined curriculum and certification on completion. Furthermore, there are established MOOC providers who are creating alternatives for recognition and qualification such as coursera's '*signature track*', 'Futurelearn's '*statement of accomplishment*' and EdX's '*verified certificate of achievements*'. These are indicators of the significant roles MOOCs can play to complement the traditional system and address partly the challenges of access and inclusion in HEI.

Alternatively, the 'Mobile-MOOC' which is a MOOC designed for mobile devices and for accessing learning contents across the internet, devoid of time and geographic limitation may be the most viable model as 'leveraging on MOOCs' for higher education in Nigeria. This may be more compelling given the progress made in adopting internet/online system for admission processes, registration and school data management in Nigeria (Adebo & Ailobhio, 2017; Muhammad et al., 2016; Rambe & Moeti, 2017). 'mobile-MOOCs' given its affordances has the potentials for increasing and widening participation if embedded into the HEI structure in Nigeria. Boga and McGreal (2014) and Gaebel (2014) argued that apart from using the MOOC access hub resources, the students can learn or participate in an interactive discussion from any location, using any available internet compliant technologies (such as smart phones, tablets, radio, television etc.). This model aligns with the growing debate on the potentials of MOOCs that can be delivered on mobile devices that have become ubiquitous among African students indeed "context aware" and 'ubiquitous learning' are emerging concept in the e-learning space.

Israel, (2015) recommended that institutions adopting MOOCs must have overarching strategic frameworks for course designs and implementation to have significant impacts on enhancing students' outcomes and reducing costs. She opined that institutions must take the lead in the provision of infrastructure, support and incentives. That will help faculty to engage with MOOCs and other online learning technologies as well as explore opportunities for research into blended MOOCs and how factors like early support, a high degree of structured content and assignments, and use of learning analytics help to guide early interventions to improve engagement, persistence, and outcomes of students.

Regarding the curriculum structure for leveraging MOOCs in underserved regions like Nigeria, Czerniewicz et al., (2014) proposed a holistic curriculum framework for adopting MOOCs as a formal, semi-formal or non-formal offering. They premised their submission on the view that there is a sudden realisation of MOOCs not been able to provide lower cost degree and remains relevant within the less constrained and

informal educational scope. Nevertheless, they provided a means for contextualising the options within an institutional landscape of educational provision as possibilities for MOOC creation, use and adaptation which this article find quite instructive and relevant to the Nigerian higher education scenario. The authors envisioned MOOCs based on institutional priorities and contexts with a focus on the type of courses that fits into the educational objectives of the institutions in particular and the nation in general.

Courses, contents and pedagogy offered in a traditional university setting are invisible except to the students and the real managers of the system. However, when integrated with MOOCs they become more open and visible to interested outsiders not enrolled to the course; this form of MOOC integration is termed “outward looking” curriculum. In this format, the course is not limited to the regularly enrolled students (also referred to as *wrapped courses*) but to the interested outsiders that signed up to the MOOC course, although they may not get the same educational support as the normal students. What happens is that more students can take the course. On the other hand, if the course is structured only for students enrolled in the university for profit, certification and a fee, then it is an “inward facing system.” With this proposal, universities in resource-constrained environments can design courses within these inward-outward structures. Figure 2 depicts a curriculum landscape for the provision of MOOCs in higher education within the proposed inward and outward facing continuum as proposed by Czerniewicz et al., (2014) as a framework that may guide the modification and adoption of MOOCs courses in the higher education system in Nigeria. The landscape categorised into three steps, The formal, Semi-formal and the non-formal.

Course -Curriculum Landscape			
	Conventional ←→ Flexible		
Curriculum integration of MOOCs	Pedagogies		Platforms
	Formal		
credit towards a formal degree with strict curriculum	Lectures	May or may not be online	Block release or online
Semi-Formal			
Stand alone often not part of a degree, may or may not be credit bearing	short courses		online
Nonformal			
No credit, not formal, aligned with curriculum	Summer school		Online

MOOCs, SPOCs, etc. not susceptible to formal curriculum or government regulation.

Figure 2: Proposed MOOCs curriculum landscape adopted from Czerniewicz et al., (2014)

The details of the courses-curriculum landscape of MOOCs in a formal domain is based on a curriculum with conventional procedures consistent with a normal, face to face university curriculum characterised by control to access, progression and assessment in an online format and credit-bearing courses. Semi-formal courses are less constrained. They support formal qualification which students may be encouraged to take even though it is not ‘credit-bearing.’ Examples of such courses are developmental courses, capacity building courses, preparatory or remedial

modular courses and optional enrichment courses that may have a shorter/longer duration(Czerniewicz et al., 2014). It is important to note that conventional courses are more readily embedded in the semi-formal and formal arrangement. In contrast, non-formal setting MOOC is usually a standalone course without credit. These scenarios are proposals for the adoption of a MOOC which is not only for increased access but for localising or contextualising the curriculum contents tailored to meet the educational needs of the people individually and collectively.

Conclusion

Drawing on the work of de Waard et al., (2012), the rapid development of technological innovations and the exponential growth of the internet, web 2.0 and mobile technologies, offers potentials for different educational structures, organisations and settings. Despite the inherent challenges of IT infrastructure and internet penetration in Africa and Nigeria in particular, the MOOCs affordances can be leveraged to mitigate the challenges of higher education in different contexts. The deployment of resources, engagement and collaborations (within and outside Africa) with institutions in developed context offers the potential for transforming higher education in resource constrained regions.

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