Massive Open Online Courses as a Pathway to Inclusive Education in Nigeria

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Abstract

This review article brings to the fore insight into some of the issues that must be considered as Nigeria makes a cautionary move to the Massive Open Online Courses (MOOC) environment. The paper draws from existing literature to highlight the features; history and growth of MOOCs to show that it is one of the most recent OERs that have emerged to facilitate inclusive access to education at relatively low costs, particularly in developing countries, like Nigeria. The paper argues for the imperatives of MOOCS as a pathway for inclusive education in Nigeria, particularly with the growing demand for inclusiveness at Higher education institutions (HEI). The paper concludes that though MOOCs offer an opportunity to remove obstacles to participation and access, particularly for poor and marginalized groups, they present certain challenges in delivering inclusive education. These challenges include inadequate digital skills, competence as well and access to dependable internet and gadgets, Also, if MOOCs are not designed within the context of relevance they may fail to achieve their intended objectives. There is a call for urgent intervention by the government and relevant stakeholders in the higher education sector as the facilities and resources needed to successfully run MOOCs are enormous and require collaboration among various stakeholders. Furthermore, Nigeria needs to catch up with the global trend in making investments in education to effectively run MOOCs and make the digital space ties readily available to ensure that there is dependable Internet access to enable inclusive online education.

KEYWORDS: MOOCs, Inclusive education, Nigeria, OERs, Digital technologies

Introduction

Digital technologies have brought in and continue to bring in changes and innovative solutions to the delivery of inclusive education (Srivastava and Dey 2018; Sandanayake (2017). Open education resources (OER)-for teaching and learning in higher education institutions is one of these inclusive digital solutions. Massive open online courses (MOOCs) are the most recent OERs that have emerged to facilitate inclusive access to education at relatively low costs, particularly in developing countries where the education sector faces several issues, including deteriorating physical infrastructure, insufficient learning materials, low teacher quality, and high dropout rates, resulting in an ever-growing army of out-of-school children who fuel antisocial actions.MOOCs are educational platforms designed for mass reach and participation, with functional study materials (Hollands and Tirthali, 2014; Czerniewicz *et al*, 2015, (McAuley et al, 2010,). Zhao et al (2019) defined MOOCs as extensions of distance learning based on OERs,

emphasizing the distinction in its characteristics which are "free of charge, open to a global audience, and built for large numbers of participants. MOOCs are expected to expand educational opportunities and close learning gaps. One of the positive global learning outcomes from the effect of MOOCs would be its contribution to the achievement of Sustainable Development Goal (SDG) 4…to e*nsure inclusive and equitable quality education and promote lifelong learning opportunities for all*. Conjecturally, within the context of the Economic Recovery Growth Plan (ERGP) and the current ten-year National Development Plan in Nigeria, it is expected that MOOCs would be a useful strategy to close the huge educational gap and the mismatch that presently exists in Nigeria between the needs of businesses and industry for skills and higher education.

UNICEF (2021) reported that Nigeria has one out of every five out-of-school children in the globe. Even though elementary education is nominally free and obligatory, over 10.5 million children aged 5 to 14 years are still not in school[1]. This is attributed to the destitution of many families as a result of overall economic deterioration, and as such enrolment rates continue to fall, and drop-out rates also rising in recent years. Available statistics from the Federal Ministry of Education in Nigeria revealed that male and female gross enrolment rates in 2016 were 87.16% and 80.40%, respectively at the primary school level, indicating a gap in enrolment for primary education. Similarly, gross enrolment rates are much lower, at 44.94% for males and 41.19% for females in junior secondary education. Gross school enrolment ascended from 85.1% in 2010 to92.1% in 2012, to 94.1% in 2013, but has declined since then, standing at 87.73% in 2016 (Federal Ministry of Education [FME, 2016]) and 87.5% in 2018 (WDI, 2021). As of 2011, the tertiary gross enrolment was about 10.2% according to information from the World Bank Indicators database. The adult literacy rate in 2018 was much higher for males (71%) than females (53%) with an overall of 62%[2]. These trends also reveal the need to close gender gaps in education with MOOCs as a veritable option.

In the last year, almost all Nigeria Universities have recognized the need for putting together their respective Learning Management Systems (LMS), which can be described as a hybrid MOOC that puts together localized educational resources in response to the COVID-19 pandemic and the global economy lockdown, which disrupted the education system. Having an LMS is fast becoming an essential part of providing training/teaching facilities not only in universities but also in corporate organizations, government, and Nongovernmental organizations (NGOs). This made educational institutions in Nigeria begin to witness an era of increased open online learning activities and also brought the issue of MOOC as a front-burner research subject in Nigeria. According to UNESCO (2020), as of April 13th, 2020, an estimated 1.725 billion learners had been affected as a result of school closures, representing about 99.9% of the world's student population. In Nigeria, the closure of schools affected close to 46 million students at all levels of education. (EIEWG, 2020). However, MOOCs are presently being considered as a new normal in terms of a response strategy and pathway to inclusive education in

[1]UNICEF (2021) https://www.unicef.org/nigeria/education
[2]https://datatopics.worldbank.org/education/country/nigeria

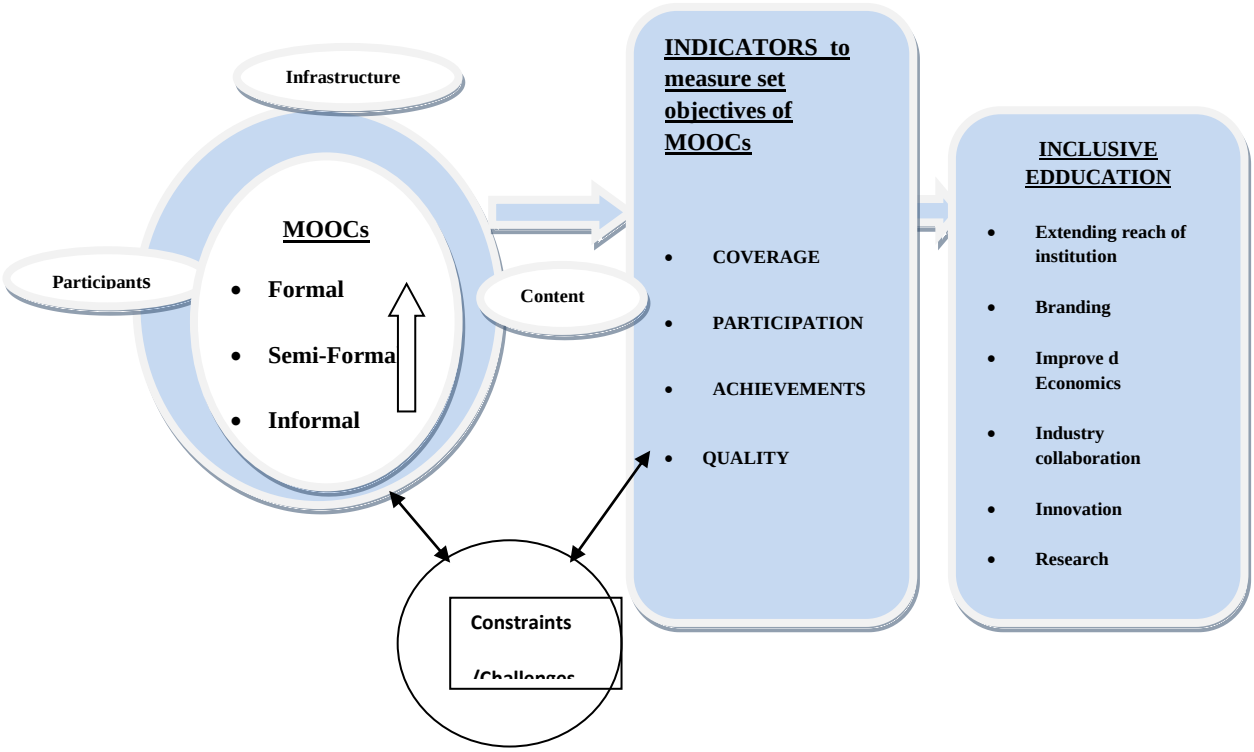
the face of the COVID-19 pandemic. The fact however remains that the relevance of MOOCs should be seen beyond this period of present educational disruption.

The objective of this paper is to bring to the fore deeper insight into some of the issues that must be considered as Nigeria makes a cautionary move to the MOOC environment. This paper, therefore, highlights the idiosyncrasies of this emergent pathway of inclusive education. This paper is organized into five sections including this introduction. Section two sheds light on the features of MOOCS, while section three discusses the history and growth of MOOCs. The challenges and prospects of MOOCS are discussed in section four and section five wraps up the paper by considering the imperatives of MOOCs as a pathway for inclusive education in Nigeria.

THE FEATURES OF MOOCS

As depicted in Figure 1, the features of any MOOC generally revolve around three sets of interactive elements, namely infrastructure, participants, and content respectively; with a central focus on achieving its objectives for inclusive education as a major outcome Conole (2014), identified benefits of inclusive learning to include creating a community of peers, enabling innovation and creativity; fostering collaboration; and achievement of quality education.

Figure 1: Understanding the features of MOOCs as a pathway to inclusive learning



Source: Author's conceptualization adapted from Davis (1989) and Console (2014)

- Participants in MOOCs include learners, tutors/instructors/teachers/lecturers, administrators, industry representatives, and policy makers (Conole, 2014). An assumption is that if participants find the MOOC environment user-friendly, useful, and easy to use, there is a likely possibility of high course enrolment and completion rates, and by extension low drop-out rates (Davis, 1989).
- Course content design, presentation as well and facilitation are also expected to play an important role in achieving the desired performance of the MOOC (Davis, 1989).
- Infrastructure to enhance communications and delivery of the MOOC has a major role to play if this pathway to inclusive education and learning is to be a reality.

MOOCs have been observed to be operationalized in three types of environments, namely non-formal, semi-formal, and formal (Czerniewicz et al (2015). The non-formal and semi-formal MOOC environments have tended to dominate, as content development is generally still domiciled in these environments, where they are offered as short vocational and/or technical

courses, either with no credits or just certified with a diploma. Examples of such courses are developmental courses, capacity building courses, preparatory or remedial modular courses, and optional enrichment courses that have varied course duration. It is however pertinent to mention that that there are several emerging interesting experiments regarding hybrid MOOCs, which can be argued to be a move of MOOCs to the formal learning environment, where the characteristics of MOOCs need to be redefined to meet conventional learning outcomes. For example, there are existing efforts in support of distance learning and the use of OERs in Nigeria, as a gradual move to the formal environment of MOOCs. Some of these efforts include the successes recorded in the open access education through distance learning provided by the National Open University of Nigeria (NOUN) as well as in the distance learning programs offered at the University of Ibadan and the University of Lagos amongst others. The National Open University of Nigeria (NOUN), was established in July 1983, by an Act of the National Assembly as the first distance learning tertiary institution in Nigeria when it became crystal clear to the then Federal Government that the ever-growing demand for education by her people cannot be met by the traditional means of face-to-face classroom instructional delivery A few private Universities in the country in the last few years developed their digital learning platforms to offer digital content and instruction to teachers and students. For example, Bowen University Iwo, Osun State concluded lectures online and conducted second-semester examinations online amidst the lockdown. Some international MOOC providers in the formal environment have emerged in Nigeria, and these include Azure Tutors and UTIVA. Authors including Czerniewicz et al. (2014) have posited that the course content of MOOCs in a formal domain will need to follow a curriculum with conventional procedures consistent with a normal, face-to-face university curriculum characterized by control to access, progression, and assessment in an online format and credit-bearing courses. It is in the foregoing regard that Conole (2014) argued that the MOOC environment will enable an inclusive education trajectory with a move along a spectrum from informal to formal; from loosely based resource-based learning to a structured, time-defined course, which is accredited.

HISTORY AND GROWTH OF MOOCs

The first generation of MOOC, coined as connectivist MOOC (cMOOC) emerged in 2008, while the second generation, labelled networked (MOOC) came up in 2012.cMOOCs were based on a connectivist pedagogy, which aimed to foster the affordances of social and participatory media. It relied on significant interaction with a distributed network of peers. Participants used a variety of technologies to reflect on their learning and to interact with others. xMOOCs were primarily based on interactive media, such as lectures, videos, and text. MOOCs adopted a more behaviourist pedagogical approach, with an emphasis on individual learning, rather than learning through peers. The success of the first and second-generation MOOCs raised a lot of interest in the public sphere, academia, and higher education institutions, and this led to the innovative experimental idea of hybrid MOOCs, as the third generation of MOOCs, delivered by a group of academics from the University of Edinburgh in 2013. The third generation of MOOCs has taken a more pragmatic approach by combining the two previous pedagogical approaches; to diversify learning opportunities and reach a broader audience. Yousef et al (2014) amongst other authors have reported on these hybrid MOOC models, which include small open online courses (MOOCs) and blended MOOCs with campus-based teaching (blended MOOCs).

To date, some of the biggest English-medium MOOC private providers include Coursera, edX and Udacity, FutureLearn, Open2learn, Udemy, NovoEd, and Iversity. These MOOCs are located in developed countries, but they provide worldwide services. They have incorporated partnerships with world-class universities including Stanford, Harvard and Yale. (Daniel, 2012). In the initial stages, the courses by these providers were organized on platforms like Zoom and Google Meet, but now most MOOC providers have their specialized platforms. Stanford University pioneered MOOCs in 2012 when three of its professors opened up courses, that were once limited to a specific number of students, accessible globally (Shah, 2020). Many other universities have since joined in making courses available online for both local and international students. Table 1 provides information on the global trend of MOOCs.

Table 1: Global Trend of MOOCs

	2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Students (Millions)	2	10	18	35	58	81	101	120	180
Universities	40	200	400+	500+	700+	800+	900+	900+	950
Courses	250	1200	2400	4200	6850	9400	11400	13500	16300
Micro-credentials			-	-	-	-	-	820	1180
MOOC-Based Degree			-	-	-	-	-	50	67

Source: Shah (2020)

The number of students on the various MOOC platforms has maintained an upward trend, rising rapidly by about 8900 percent from 2 million students in 2012 to 180 million students in 2020 with the highest and lowest growth rates totalling 400 percent and 18.8 percent in 2013 and 2019 respectively. In the same vein, the number of courses continues to rise over the years. However, even though there has been a marked increase in the number of courses offered on various MOOC platforms between 2012 and 2020, its growth rate declined consistently from 380 percent in 2013 to 18.4 percent in 2019 but it rose to 20.7 percent in 2020. Moreover, micro-credentials, certificates earned through short and transparently assessed courses, and MOOC-based degrees grew from 820 and 50 in 2019 to 1180 and 50 in 2020 respectively. It is important to note that the significant increase in the number of students, universities, courses, micro-credentials and MOOC-based degrees in 2020 is attributable to the disruption caused to physical learning by the COVID-19 pandemic, which compelled online learning. There are several subjects taught on MOOCs platforms including business, technology, humanities, science, and social sciences, among others. The number of universities involved in MOOCs has continued to grow since inception as it grew markedly by about 2275 percent from 40 universities in 2012 to 950 universities in 2020. According to the World University Ranking by MOOC Performance in 2020, universities from North America, Europe, and Asia dominate the top 200 universities

offering MOOCs.[3] This shows that universities in Africa including Nigeria are not globally competitive in terms of MOOCs. Table 2 gives information on the top four global MOOC platforms in terms of the number of learners, courses, micro-credential and degrees offered by Coursera, edX, FutureLearn and Swayam respectively.

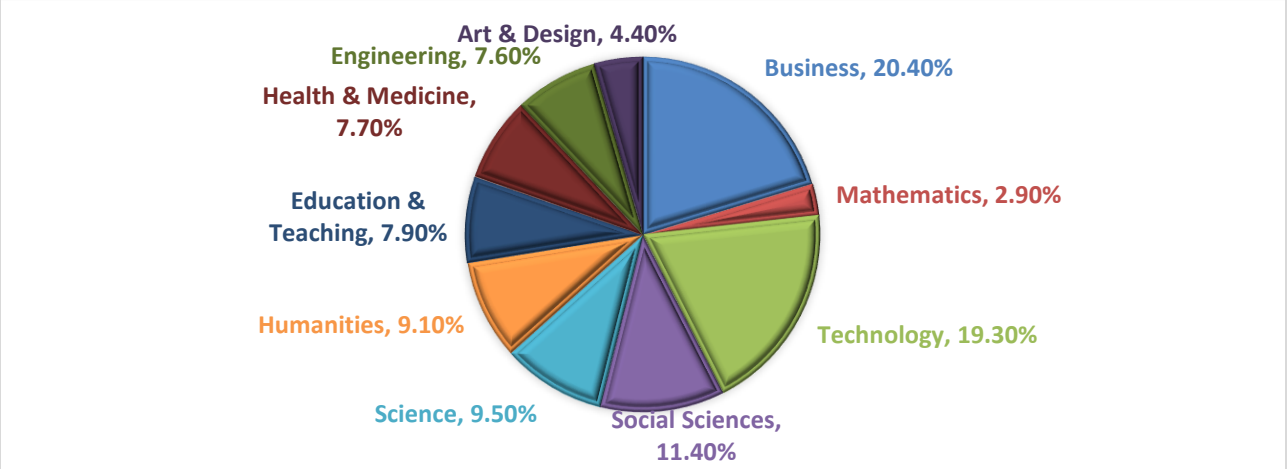
Table 2: Top MOOC Platforms in 2020

	Learners	Courses	Micro-credentials	Degrees
Coursera	76 million	4,600	610	25
edX	35 million	3,100	385	13
FutureLearn	14 million	1,160	86	28
Swayam	16 million	1,130	0	0

Source: Shah (2020)

Figure 1 shows that business-related courses are the most common courses on MOOC platforms and this accounts for 20.4%. Technology-related courses towed in second place with 19.3%. The dominance of business and technology-related courses signals the desire to develop technologies and commercialize them for work simplification and increased profitability. In addition, business and technology could be applied to various disciplines and spheres of life. Social science courses are taken by 11.4% of students while other courses have less than 10% of students enrolling for them, not because the courses are not important but as a result of personal preference.

Figure 1: Distribution of MOOCs across Subjects, 2020



Source: Shah (2020)

[3] https://www.mooclab.club/pages/wurmp-full-list/

Prominent MOOCs are hosted and run largely by Ivy League institutions in developed countries particularly in Europe and North America (Trehan et al., 2017). Similarly, MOOC research is mostly conducted by authors from the global north (Liyanagunawardena et al, 2013). The early research on MOOC-related issues had been mostly qualitative with narratives and case studies dominating the literature (Jacoby, 2014), but recent studies are coming up based on quantitative analysis. Zhu et al. (2018) reviewed 146 MOOC-related empirical papers published between October 2014 and November 2016 and found that most authors adopted quantitative research methods, the method of data collection was mostly through a survey with the prominent analytical technique being descriptive statistics. Similarly, Babori (2020) reviewed 100 MOOC-related studies drawn from 36 reputable peer-reviewed journals and found that most studies utilized questionnaires for their data collection, and analysis of the data is mostly done through descriptive statistics.

The review of 183 MOOC-related empirical paper publications from 2013 to 2015 by Veletsianos and Shepherdson (2016) showed the dominance of authors from Europe and North America. Similarly, Gasevic et al (2014) revealed the dominance of Western authors in the application for research grants at the MOOC Research Initiative. However, most of the empirical studies are so limited in scope that they fail to address MOOC-related issues in developing economies. The reason for this is not far-fetched as most of the top-notch MOOCs are domiciled in universities in Europe and North America. This obvious geographical skewness in MOOC research in favour of developed countries suggests that MOOC research is still nascent in developing countries thus, limiting the scope of understanding MOOC and depicting that MOOC research is still a regional phenomenon rather than a global phenomenon. This could be attributed to the limited capability (in terms of skilled manpower, financial resources, and infrastructural development) to fully and effectively operationalize MOOCs in developing economies (Olanrewaju and Afolabi, 2021).

Challenges and prospects of MOOCs

Empirical evidence from the works of Explorance, (2013) and Pickard (2018) has documented the challenges facing MOOCs to include: low completion rate, limited accountability, and accreditation, skewness in accessibility, high cost of creating online courses (financial sustainability) and unstandardized evaluation methods.

i. Completion Rate

Despite the growing number of student enrollment for MOOCs, the completion rate has been recorded to average less than 10 percent (Jordan, 2013). Pickard (2018) showed that only 7.5% of the approximately 200,000 enrollees for one of the courses on edX completed the course while only 34% of them accessed the course. This indicates that most enrollees only signed up for the courses without the motivation to complete them possibly due to the possibility of auditing courses without payments and the flexibility of the learning process. Explorance (2013) however cautioned that the course completion rate is not a good indicator for measuring the success of MOOCs as the rate does not

account for the learning experiences of enrollees. While some enrollees garner requisite knowledge from specific contents of a course without completing the course, others participate in discussions or passively learn from the discussions without necessarily completing the course.

ii. *Accountability, accreditation, and transparency*
These are also key challenges facing MOOCs as it is arduous to prevent malpractices during online examinations or assessments. The possibility of malpractice increases when such courses culminate into a university degree or will be used for promotion or employment exercises. These weaknesses in MOOCs are the motivating factors for many students to enrol in MOOCs. This could lead to the preponderance of half-baked graduates and a high level of incompetence in the labour market. Mingming and Yanli, 2014) argued that ensuring credibility and preventing counterfeiting are daunting tasks that need to be addressed for MOOCs to be credible. Interestingly, this challenge can be addressed through the deployment of technological devices such as remote proctoring and the use of camera and computer audio devices during examinations.

iii. *Low awareness of the existence of MOOCs*
MOOCs have further widened the digital gap rather than bridged it as it is often accessed by graduates. For example, the majority (almost 75%)of enrollees in edX's MOOCs previously had a university education given the low awareness of the existence of free and low-cost courses among non-graduates as against technological access (Pickard, 2018). This makes collaboration with key stakeholders important to ensure a rise in the level of awareness of MOOCs.

iv. Accessibility, Affordability, and Sustainability
MOOC providers need to take cognizance of accessibility when designing their multimedia content to reduce the challenge of accessibility. The costs associated with creating courses together with the long wait before recovering the money is another major challenge facing MOOCs (Pickard, 2018). This serves as a great discouragement for creators of the courses as they could run at a loss if the enrollment rate falls.

v. *Non-Standardization in Evaluation*
The lack of uniformity in standards for evaluating MOOCs poses a great challenge to the credibility of the certificate earned from the courses. Mingming and Yanli (2014) alluded that the unstandardized evaluation method for MOOCs lowers the level of education from the platform and some courses cannot be effectively evaluated online but in a traditional school setting. Pickard (2018) reiterated the urgency with which these challenges should be addressed as they are capable of stifling MOOCs into extinction if left unattended.

Despite these challenges, MOOCs have great prospects as they continue to revolutionize the global educational sector. MOOCs are poised to make education inclusive across the world as it affords everyone the equal opportunity of getting educated insomuch as the infrastructural facilities and devices to access the internet are readily available. MOOCs provide opportunities

for people to garner modern knowledge and skillsets (Explorance, 2013). This will not only raise the standard of education globally but also ensure increased competitiveness of students from developing countries in the global market (Devgun, 2013). MOOCs also hold the key to unlocking the potential for increased employment generation across the world. This is because apart from the MOOCs creating job opportunities for the creators and designers of the courses, it also empowers the students by building their human capital, which will ultimately help them create employment opportunities and help them make significant contributions to their immediate societies. This will also ultimately improve the general welfare and nip poverty in the bud. Given their borderless and universal nature, MOOCs have the potential to ensure educational continuity with little or no disruption to academic calendars as was the case during the COVID-19 era. Many students were out of school during the pandemic as their institutions were not adequately prepared for the pandemic which not only caused restrictions in mobility but also discouraged physical gatherings and halted academic activities across the globe, especially in developing countries. MOOCs and digital learning played key roles in ensuring that learning continues despite the restrictions to physical learning as a result of the lockdown orders of the government geared towards flattening the COVID-19 curve (Olanrewaju &Afolabi, 2021).

MOOCs hold the keys to fast-tracking the adoption of digital technologies and the transfer of requisite digital skills required in the modern labour market. For example, computer literacy is a major prerequisite in the modern labour market and MOOCs are well-equipped to help students learn computer skills during their study as the courses are done using computers and other digital devices. In sum, myriads of challenges threaten the viability and credibility of MOOCs and MOOCs also present various opportunities for ameliorating the current performance of the global educational sector. This all-important technological innovation needs to be fully embraced to maximally tap into its potential for improved human capital development and productivity.

The imperatives of MOOCs for inclusive education in Nigeria

The growing demand for inclusiveness within the educational landscape, particularly at Higher education institutions (HEI). This group of institutions plays key roles in promoting talents and education, beyond the secondary school level; to the tertiary level by the university, polytechnic, or college of education (Adeyinka &Wahab, 2015). HEIs foster entrepreneurial mindsets and skill levels in Nigeria and boost the potential to leverage innovative ideas that will transform the system for increased access and opportunities for quality and affordable education. The hitherto brick-and-mortar educational system that has existed in the country will no doubt experience a boost under the injection of new solutions and technologies, such as OERs and in particular MOOCs to address critical human resource needs for millions of individuals who would not otherwise have had access to higher education in particular (De Waard et al, 2012; Wogu et al 2016). The high proliferation rate of MOOCs poses multifarious challenges to the global education sector and also presents several opportunities for revolutionizing the sector. MOOCs have been identified as a major driver of inclusive education given their universal accessibility and potential to bridge the education divide among countries. This makes the adoption of MOOCs imperative in Nigeria as the country is bedevilled with a high illiteracy rate and educational exclusion. It also calls for a more nuanced approach to institutional strategies

towards promoting MOOCs in Nigeria. Empirical evidence as in Angya (2020) revealed that countries with impressive development strides prioritize not just quality education for their population but also the build-up and investment in infrastructure through which knowledge is communicated for effective delivery. Succinctly the goals of educating the population with state-of-the-art tools and promoting innovation in the educational sector are achieved. This no doubt has ripple effects on the labour market and the entire economy.

Given the quest for Nigeria to experience positive economic transformation and inclusive growth, the deployment of digital education through the promotion and adoption of MOOCs becomes imperative. Many graduates from Nigerian tertiary institutions lack digital skills which have become a key requirement in the global labour market, a situation which makes them unemployable. This has also increased the digital dependence of the country on other countries as Nigeria remains, at best, a consumer, rather than a producer of technology. In addition, MOOCs have the potential to accommodate and drastically reduce the high number of students seeking admission into tertiary institutions in Nigeria. MOOCs have the capacity not only to fix these lacunas but also to position the Nigerian educational sector at the frontline of digital education across the world. This will help increase the number of international students the country attracts and put Nigeria in the league of countries with a high number of international students, a key criterion for ranking educational institutions. The development and preponderance of MOOCs in Nigeria will also create increasing employment opportunities for various classes of people particularly those in the services sector such as web developers, content creators, and lecturers as the number of part-time courses will surge as well as the enrolment rate. Given its unrestricted coverage, MOOCs will tremendously reduce the level of illiteracy in the country as well as achieve the Sustainable Development Goal (SDG) target of “leaving no one behind.”

Conclusion

No doubt, MOOCs may be a pathway to inclusive education in Nigeria by providing the opportunity to remove obstacles to participation and access, particularly for poor and marginalized groups. MOOCs can also offer customizable and tailored learning paths that suit the interests and objectives of learners with a variety of backgrounds, skills, and requirements. However, MOOCs present certain challenges in delivering inclusive education. MOOCs require some amount of digital competence as well as access to dependable internet and gadgets, which many students may not have or cannot afford. Furthermore, MOOCs may fail to fully address the social and emotional aspects of learning, such as contact, feedback, and motivation, all of which are necessary for cultivating a sense of belonging and engagement. Therefore, for MOOCs to be useful as a pathway to inclusive education, they need to be designed and delivered with attention to the diverse needs and contexts of learners, and complemented by other forms of support and guidance. Only then can MOOCs truly contribute to creating inclusive and equitable quality education for all.

Recommendations

This paper makes the following recommendations for adoption of MOOCs as a pathway for inclusive education in Nigeria

1. There is a call for urgent intervention by the government and other stakeholders in the higher education sector as the facilities and resources needed to successfully host and run MOOCs are enormous and require collaboration among various stakeholders
2. Inadequate funding of the education sector in Nigeria remains a major clog in the wheel of progress of the sector. To this extent, Nigeria needs to catch up with the global trend in making investments in education to effectively run MOOCs and make the necessary digital devices and infrastructural facilities readily available to ensure learners and facilitators have dependable Internet access to enable online learning.
3. There is a need for early digital literacy training opportunities to support and develop needed skills and confidence to effectively use online platforms and resources.
4. The design of MOOCs by seasoned academics in educational institutions in Nigeria should be encouraged, but it must take into consideration local relevance and context, this is to ensure that the contents are appropriate for the learners' needs and interests. This can be achieved via collaboration and interaction among learners and facilitators through online forums, peer feedback, group projects, and mentorship to foster a sense of community and engagement.
5. As MOOCs become imperative and offer a platform for continuous learning in Nigeria, there is a need for the integration of modern needs into the system. To this extent, the design of the grading system of MOOCs should be competitive with existing education systems to ensure recognition and accreditation for learners who choose this pathway as an option for inclusive education.

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