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## Chapter

# The Adoption of Massive Open Online Courses in Selected Sub-Saharan African Countries: The Experiences of Urban Learners

*Vollan Ochieng', Maurice Mutisya and Caroline Thiong'o*

## Abstract

MOOCs is slowly gaining traction in the education provisioning in SSA. Much of this is attributed to governmental and institutional aim of providing quality and affordable universal education to all learners. This chapter explores how MOOCs is affecting access to learning in SSA, with particular bias to urban education context. Evidence adduced in this chapter was adduced from secondary sources, involving review of relevant literature available from internet sources. In the internet sources visited, key search terms that were used in obtaining the relevant resources included but not limited to: 'MOOCs and education', 'MOOCs in Africa', 'Education technologies AND MOOCs in Africa', 'MOOCs, OERs adoption and adaptability in Africa', and 'MOOCs' challenges in Africa' among others. It emerged that while MOOCs is gaining the needed traction in the SSA education space, the pace of its development is slow and calls for a more concerted effort from concerned education stakeholders.

**Keywords:** urban education, massive open online courses (MOOCs), distance learning solutions, learning and teaching

## 1. Introduction

The onset of COVID-19 has set the stage for the hitherto ignored learning approach – virtual/distance learning solutions. The approach (distance learning) could be observed as a blessing amidst a curse (pandemic). It is an approach that could be explored and expanded to promote learning for all as it has the capability of breaching the geographical and distance barriers in access to quality education. With the school closures due to COVID-19, most governments in SSA, like the rest of the world, adopted distance learning to ensure continued learning. In this chapter, we look at Cote d'Ivoire, Ghana, Kenya and Nigeria as case examples. Evidence from the foregoing in the education space – catalyzed by COVID-19, indicates that the future of education is digital and online, further re-emphasizing the central place of Massive Open Online Courses (MOOCs) in the attainment of SDG-4. The MOOCs place in the education sphere is thus validated. From the foregoing, it would be important to understand the place MOOCs in the African educational context.

This chapter explores the place of MOOCs in selected sub-Saharan African countries – Cote d'Ivoire, Ghana, Kenya and Nigeria – in relation to the advancement of education in the countries' urban areas.

## 2. What is MOOCs?

Massive Open Online Courses (MOOCs) is an education platform that is gaining popularity in the field of education in the recent times. Like the name, MOOCs are synonymized by learning provision that is technology enabled, meaning that they are largely utilizable via the internet or online, and are open (meaning their potential users are not restricted on access). Also, they are 'massive' in the sense that the platform can accommodate a huge (massive) number of learners at any given time [1]. MOOCs can be traced from Dave Cormier lecture on connectivism in 2008 that was used to synonymize learning's development [2].

Today, varied definitions of MOOCs do exist, and this is to a large extent attributed to the existing divergent viewpoints on MOOCs as a median of learning by proponents and opponents, emergence of varied platforms, MOOC's wider scope, as well as its perceived futuristic feature, where opponents perceive it as a yet to mature learning approach/medium that cannot be scalable in the current context.

At its inception stage, MOOCs' definition was that it was a learning platform that encompassed the linkage of social networks, accessible by a renowned expert in a study discipline, and an assemblage of open internet-based learning materials. The platform was such that it could accommodate mass number of learners, organized according to their field or discipline of study interest and study goals [3, 4]. Laurillard [5], on the other hand offered a perceived easier definition which stated that MOOCs is an online/internet enabled learning that is created to support a huge number of learners. Chai's [6] definition is no different from that of McAuley et al. [4], as the former [Chai's definition] maintained that MOOCs are open learning platforms that are freely accessible to all learners, geographical location notwithstanding, provided that such learners has access to internet connectivity and education enabling technologies like computers, tablets, and smartphones among others. De-Waard [7] reinforces the above captured definitions by maintaining that MOOCs is an online learning platform in which learners gather to share experiences and knowledge either at the workplace or in schooling aspects and work in collaboration as well as individually to learn more using the available learning resources in MOOCs platforms.

## 3. How MOOCs work

In terms of form or appearance, MOOCs being online based platform where users access learning contents via the internet, it often take or come in the following formats that users utilize in enhancing their skills-set: learners interaction platforms through forums; recorded or filmed video lessons; exams and internet-based assessments; engaging educational modules; literacy; and sets of problems for users to solve [6]. Typically, for each MOOC, there is need for a course platform and a provider of the course. Examples of providers of course(s) are universities and colleges that avail lecturers or instructors as well as course(s) learning materials for learners/users' access and interaction in the existing platform [6, 8]. Among the widely existing and known platforms that offer the requisite technological structure for MOOCs' course modules include Coursera (Udacity), EdX and Canvas among others [6, 9].

Given the above MOOCs' definitions and features, it can be argued that definitions of MOOCs is inspired by its acronym 'MOOC' as it emphasizes shared involvement or participation as well as collaboration in learning. Despite the notable definitions advanced for MOOCs, it is still observed to be loosely defined since in whole, MOOCs can be observed in relation to the scalability of distance and open learning services that are available online [8]. Ordinarily, a MOOC may be either less structured or fashioned in a university or college like system. MOOCs' despite not according its users the much-sought certification, it has gained traction in the recent past due to its contribution to the furthering and enhancement of users' employment prospects [6].

From the foregoing, it is evident that key distinguishing features of MOOCs are: free access to MOOCs' learning resources; and, mass participation in learning via the MOOCs' platform. We thus explore MOOCs in this paper from the mentioned MOOCs' features.

#### **4. MOOCs in Africa**

Proponents of MOOCs within and outside the continent is rooted on the perception that that MOOCs presents a perfect avenue for providing affordable and quality education for learners in higher education institutions (HEIs) and individuals in pursuit of career development [10]. This is expressly due to the fact that MOOCs is largely appreciated by users falling in this category [learners in HEIs, and those seeking to advance their careers] [6].

Africa has over the years contended with perennially low enrolments to HEIs, specifically due to high costs of university education, high or excess number of learners seeking opportunities at HEIs against few slots in existing HEIs or low grades attained at secondary/high school level that restricts entry to HEIs to only high performers. Consequently, learners unable to secure slots at prestigious public HEIs have been forced to discontinue their education, forcing them to settle for casual or low level employments that require minimum/low level of skills-set.

The diminished opportunities at HEIs led to the enactment of laws that permit privatization of higher education learning in the 1990s for most African countries, to accommodate learners unable to secure opportunities in public universities. This practice led to deliberate random increase in private HEIs in the continent. This practice expanded opportunities for learners seeking university slots, and even provided varied and flexible learning time. HEIs learners thus have had the option of choosing among the varied learning times, the ones that best suited their programs [10]. For instance, one could opt for either distance learning module, day, weekend or evening classes.

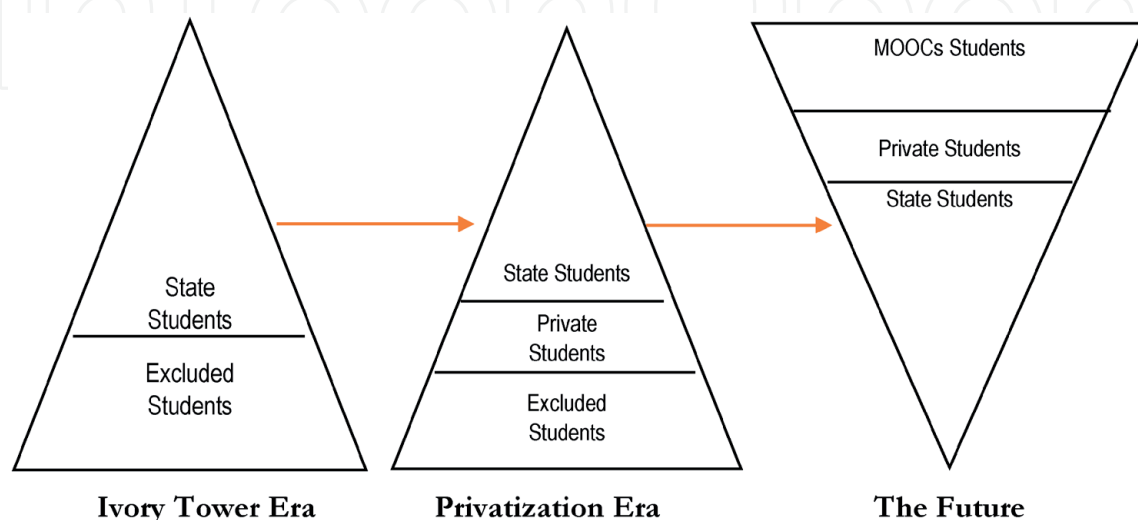
The irony however, is that even with these developments, learners who attain the minimum required HEIs entry points still fail to join HEIs, even when they are selected to join them, due to abject poverty that such learners are subjected to [11, 12]. The prevailing poverty scenario in Africa has reduced the continent into a mere spectator in the ongoing MOOCs discourse and practice. This could be understood given the widespread poverty incidence across the country in comparison with the context of the developed countries [13].

However, due to the high cost of schooling, including those pertaining to learning materials like textbooks, the continent see MOOCs as an alternative affordable education platform. This is particularly due to the MOOCs' feature of free utility, which has made MOOCs to be more attractive to developing countries. As noted previously, MOOCs prevalence is more on HEIs level compared to primary and secondary level in the African continent and this could perhaps be explain by the

fact that at the HEIs level, funding and or support for learning lower than for primary and secondary levels. This is because the cost of learning increases with level, implying that the higher one goes the education ladder, the higher the cost. This has led to the governments (in sub-Saharan Africa) to prioritize provision of funding for primary level compared to secondary and tertiary levels respectively. Moreover, primary level is cheaper and covers more learners, which is a contrary case for tertiary level where the costs are higher yet covering fewer students [14]. MOOCs at HEIs in Africa is thus seen as a deliberate effort to address the high cost of HEIs and keep majority of learners from vulnerable, poor and marginalized areas in HEIs and or support them in accessing quality learning materials. The MOOCs platform is perceived as a crosscutting skills' development vehicle that is keen on eliminating school dropouts post-secondary education level [10]. However, due to the COVID-19, varied levels of learning institutions (including primary and secondary) have adopted the MOOCs as the new alternative learning platform to keep learning ongoing during the school closure period [6].

Oyo and Kalema [10], offers a model (**Figure 1**) that depicts the entry and or access scenario into HEIs in the African continent where in the past, access to HEIs was limited to learners from the privileged settings, dubbed the society of the elite. This was followed by the present scenario where access to HEIs is characterized by privatization of learning in HEIs to maximize on access and or enrolments to HEIs [both public and private]. The paradox however, is even with the increased privatization of HEIs with the aim of increasing access to higher education (HE) learning, an equally higher number of learners seeking HE learning are unable to enroll to these institutions owing to the fact that enrolment to the private HEIs involve costs that learners from poor, and marginalized settings/households are unable to afford [11, 12].

The era of MOOC is thus perceived as the future of learning and deemed as a driving vehicle for equal access to learning owing to its relatively cheap cost – free access to learning contents and materials, provided an individual has access to enabling devices or infrastructure like laptops, tablets, internet, and electricity among others [15]. Despite being viewed as a future education equalizing vehicle, COVID-19 has brought forth the future owing to the mass use of MOOCs' components that include the open educational resources (OERs). It is however important to note that for a noteworthy uptake of MOOCs and related OERs features, it is imperative that sub-Saharan African (SSA) governments prioritize the need to



**Figure 1.**

*HEIs' access viewpoints: The ivory tower era, the present [privatization era] and the future. Source: Adopted from Oyo and Kalema ([10], p. 4).*

strengthen the HEIs' infrastructure and personnel. This include political good will towards MOOCs and OERs, strengthening HEIs' teaching/professional competencies, and providing free or cheap internet bandwidth to MOOCs users and potential users.

## **5. Effects of MOOCs on urban education in cote d'Ivoire, Kenya, Ghana, and Nigeria**

The uptake of technology-enabled education in the African continent is on the rise, a situation that could be attributed to significant in-country investments in the provision of internet to its inhabitants, particularly through undersea fiber optic cables [16]. Users and or adopters of MOOCs in Africa, like in other global regions is to a large extent a preserve of higher learning institutions, with corporate bodies following in pursuit. This could be perhaps due to the fact that the genesis of MOOCs and related OERs was from top higher learning institutions that include Stanford, Massachusetts Institute of Technology (MIT), and Harvard, with the successes observed in these institutions' use and adoption of MOOCs believed to be replicable in other higher learning institutions.

Even with the observed internet provision efforts observed [16], Africa and in particular, sub-Saharan African (SSA) region, is still riddled with inadequate internet access, a situation which limits its participation and use in the global internet provided resources. For instance, the International Telecommunication Union (ITU) revealed that only about 16% of the region's (SSA) inhabitants (constituting some 140 million individuals) had access to internet as of 2014 [16]. Evidence [17, 18] indicate that the situation has not changed, as internet access in SSA has largely remained low. Equally, access at household level is even discouragingly low as households with internet access is below 20% [16, 17], with those in urban areas constituting the highest proportion of households with internet access [17]. This implies that the region's internet access gap is very high [19], thus reducing the region's capability in accessing and utilizing internet resources, among them MOOCs for learning and teaching [9, 20].

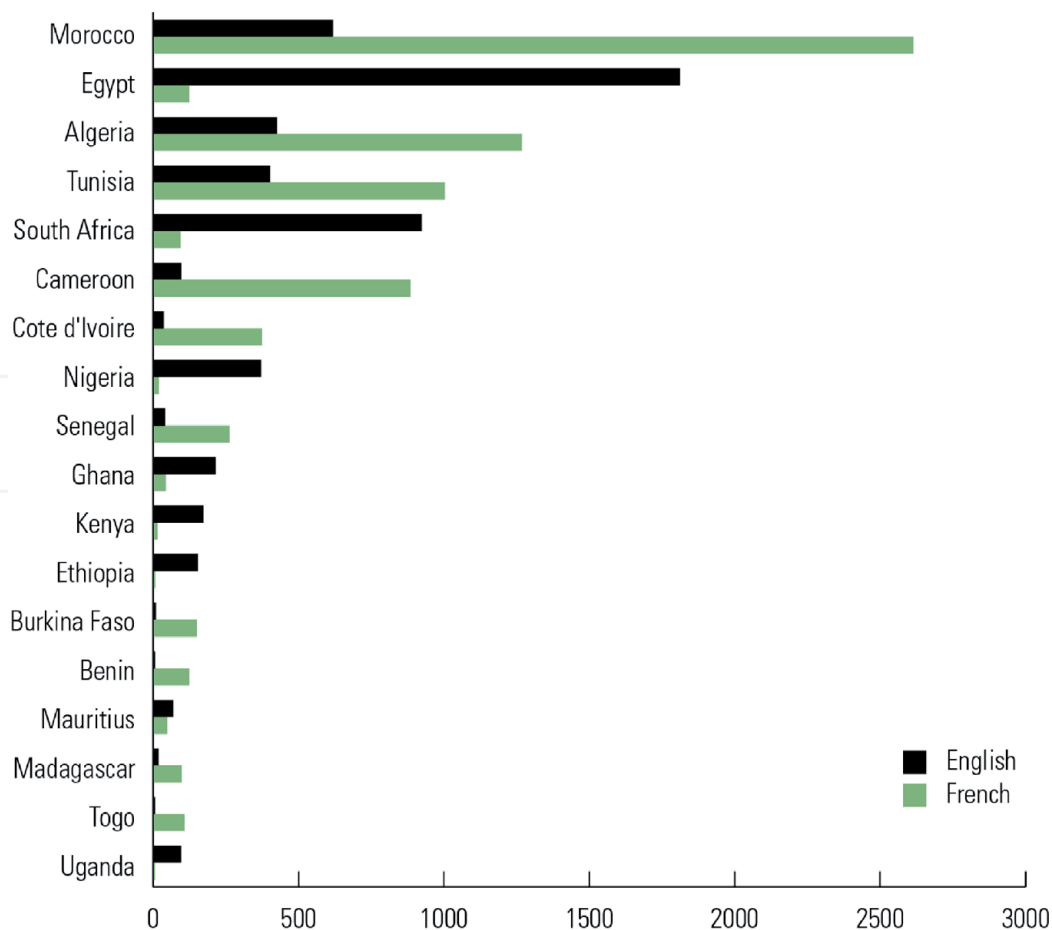
Online learning through various distance-learning solutions (education technologies – EdTechs) have been proven to reduce educational costs as well as promote access, quality and equitable learning [9, 16]. Considering that access to MOOCs and open educational resources (OERs) is to a large extent driven or enabled through internet, the SSA and the African continent at large remain underserved leading to diminished access to MOOCs' resources by learners and educators from this region. However, countries like Kenya, South Africa, Tanzania, and Uganda are making significant strides in the adoption and adaptation of online learning, by leveraging on existing enabling online-learning technology systems [21, 22].

Urban centers in SSA region are practically the areas that comparably to other regions in the continent (e.g. peri-urban, and rural areas), are enjoying internet coverage and access. It would therefore, imply that learning and teaching through MOOCs or OERs is more pronounced in urban areas than in rural or peri-urban areas [20]. However, this is not the case for a significant number of SSA countries. In Kenya, for instance, despite the country enjoying the use of undersea cable drawn all the way from the United Arabs Emirates (UAE) since 2009, a large swathe of the country is not accessing this service, resulting in over 70% of the population having no access to internet [18, 19]. This by extension has resulted in these underserved populations' inability to access internet-provided resources. In particular, education, which is a key user of internet for the development, sharing/distribution, revision, re/use of educational resources has been disadvantaged [23].

Even within the urban households, access to internet is limited to affordability and therefore I will not be surprising to find a high number of urban households not having access to internet. This has resulted in unequal access to internet and utilization of educational resources availed through internet-enabled platforms like MOOCs and OERs [9]. Against this background, MOOCs and OERs’ utilization for learning and teaching in Kenya has not received the optimum user-threshold.

In Cote d’Ivoire, the predicament is same as that of Kenya, as there are inadequate infrastructure and systems that can support MOOCs and OERs for learning. In fact, limitations of internet access outside urban areas is considered a key impediment to the utilization of MOOCs and OERs, which if compounded by infrastructure and systems related limitations like inadequate learning institutions’ staffing, ICT, and program design, worsens the situation [24, 25]. This however, could change if the country’s recognition of the importance of distance learning solutions, through MOOCs and OERs, in provisioning of quality teaching and learning, especially at the higher education level is anything to go by (EdTech [25, 26]). The country sought to establish a MOOCs and OERs driven higher education institution – the Digital University of Ivory Coast – that was not only intended to promote distance learning for both urban and rural users, but also to modernize research and learning at higher education institution through the use of distance learning solutions (EdTechs) (Figure 2) [25, 27].

In Ghana, adoption and usage of MOOCs is likewise determined by the in/existence of enabling resources like MOOCs and OERs systemic quality, the system/platforms’ performance, and learners and teachers computer knowledge [28]. While usage of MOOCs and OERs in Ghanaian urban areas would be expected to high,



**Figure 2.** African countries’ participation in MOOCs, by instructional language. Source: Adopted from Gérard et al. [16].

considering the relative prevalence of internet in the country's urban areas, this is not the case due to the perceived and real lacking interest in MOOCs and their use among students [28, 29]. This is further exacerbated by the limited internet and enabling or assistive devices' [e.g. tablets, smartphones, computers etc.] access at the household level [30, 31], which limits usage of MOOCs and related OERs at urban household level. This situation has resulted in limited access to and usage of online learning and teaching resources for urban learners, further entrenching existing inequities in the provisioning of education and related resources at local and country level.

Nigerian context as pertains to MOOCs is a replica of the continent's investment in MOOCs. Notable MOOCs investments in Nigeria are premised in higher learning institutions given its flexibility and potentials [32]. Some of the universities in Nigeria that offer programs that mirror MOOCs include the University of Ibadan (UI), Kaduna State University (KASU), University of Port Harcourt, Bayero University Kano (BUK), University of Lagos, the National Open University of Nigeria (NOUN), and Centres for Distance and Continuing Education at Ahmadu Bello University, Zaria (ABU) [33]. The biased adoption and adaptation of MOOCs in higher learning institutions in Nigeria points to a gap in adoption and utilization of the MOOCs platform in basic level (primary and secondary/high school levels), which are potentially key beneficiaries of MOOCs. Inadequate financial resources, lack of or inadequate enabling technological resources are some of the notable limiting factors that militate against development of education and related platforms in Nigeria [10, 21, 33]. While notable investments have been made that leads to positive trajectory in the adoption of MOOCs in Nigeria, they are to a large extent restricted or limited to higher learning institutions. Learners outside these institutions' environment are restricted in terms of access and use. Even those with access to the MOOCs platforms contend with the challenge of internet access among other technology aiding resources [32, 33]. This imply that urban learning and learners, though expected to benefit from MOOCs, also experience limitations in access and use of MOOCs, considering the inadequate enabling infrastructure.

## **6. Conclusion**

African governments as well as educational institutions have recognized the central place of MOOCs and OERs in the advancement of quality and inexpensive education that meet the global or international standards. Against this background, there are noteworthy efforts, undertaken through a painstaking process, that can be witnessed in the continent's education providing institutions, particularly higher education institutions. A key effort in this context is the provision of learning programs in universities that imitate and mirror the MOOCs and OERs approaches, like online learning and teaching as well as provisioning of learning materials for learners' access freely. There are however, salient gaps that key education stakeholders could take into account, if efforts to promote and improve MOOCs and OERs adoption and adaptation into mainstream education is to yield desired results. The gaps could also be viewed as opportunities for stakeholders' involvement depending on vantage point that one looks at it. Such gaps include limiting internet infrastructure and related ICT infrastructure like computer or ICT labs, which higher learning institution providers could work on expanding, including coming up with innovate ways that spur uptake and usage of MOOCs. For instance, could make deliberate efforts to support and encourage students' use of OERs and MOOCs using the most suitable and innovative approaches. Moreover, efforts should be made in capacity building learners and/or users of MOOCs ICT skills where and when needed.



On the part of MOOCs developers, deliberate efforts should be cast on guaranteeing that the right curriculum, quality instructional and appropriate pedagogical methods are availed and used in the MOOCs platforms that learners are exposed to.

It is also evident that inequities and inequalities' dynamics in the urban space play an important role in accessing and using MOOCs and related OERs for learning. While it is expected that urban centres, being perceived to have sufficient infrastructural, would have a near universal access to internet and consequently, online learning resources like MOOCs and OERs, this is sadly not the case as diverse poverty scenarios and different wealth quintiles determine uptake and usage of online resources. For urban households, only households with internet connections would have consistent access and use of the online learning platforms. Such households are however, the minority with majority of households lacking internet connections, hence making learning in urban areas using MOOCs and OERs to be an imbalanced intervention that further entrench education inequities and inequalities.

Finally, the salient ICT infrastructure challenges notwithstanding, African governments and educational institutions could leverage on the affordability of MOOCs and OERs to mitigate the inherent high cost of learning, particularly in higher learning institutions. This could particularly be effectively and efficiently explored through institution-to-institution collaboration, especially with the institutions in the developed countries, to act as benchmarks and help transform higher education institutions in the SSA region.

## 7. Recommendation

The following recommendations would thus suffice if efforts to make access to and utilization MOOCs and OERs a universal initiative that addresses aspects of educational inequities and inequalities:

- a. Students' uptake of MOOCs and OERs, regardless of context (location – urban or rural, and socio-economic context) is highly dependent on teacher-student support [28, 34]. It is therefore, imperative that instructors, educators or lecturers be at the forefront in supporting learners to use MOOCs or OERs. Such support could relate to students' capacity building on re/use of online enabling resources (ICT) as well as provision of relevant and quality educational contents on the MOOCs' platforms;
- b. Enabling resources or environment (e.g. infrastructure related like internet and related technologies' access etc.) is also observed to be a key determinant on uptake of MOOCs [35–39]. It is hence important that education providers, including both basic and higher learning education providers as well as state and non-state education stakeholders to prioritize and re-emphasize the important place of MOOCs in providing quality and affordable learning and teaching. This could be done by through provision of reliable internet access and related e-laboratories for e-learning at institutional level, as well as governmental and non-governmental educational actors support in provisioning household or public internet access primarily for accessing and using MOOCs;
- c. Evidence [40], points to a unidirectional relationship between teaching quality and usage of MOOCs. It implies if quality is to be guaranteed in the MOOCs, adoption and enrolments to MOOCs will equally increase. For this reason, MOOCs' developers should endeavor to use and provide educational contents that are guided by an appropriate pedagogy for all learning levels.

For instance, it is observed that MOOCs' providers tend to rely on a pedagogical approach that is cognitive-behaviorist centric [41, 42]. It thus follows that designers of MOOCs' instructional resources ought to take into consideration the need to provide learners with materials for learner(s)'s assessment, giving and obtaining feedback, provide materials that are applicable for remote usage, and materials that highlight the learning outcomes at the onset of the online lessons [43]; and,

- d. Ease of utility is another determinant of uptake and use of MOOCs [35, 38, 44]. This shows that the performance of MOOCs in terms of its user-friendliness and ease of accessing the sought educational contents is integral in MOOCs' utility to learners. To address this concern, MOOCs' providers and developers of its contents should ensure existing MOOCs' systems are user-friendly. This can be attained by having place a system that is easy to navigate, accessible even via smartphones (or any other hand-held gadgets), fast-loading site, learning sites that are visually appealing, and easy to utilize.

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