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The Potentiality of MOOCs as a Tool for Widening Access to Higher Education in the African Context: A Systematic Review

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Abstract. Emerging educational technologies and technological pedagogical innovations such as massive open online courses (MOOCs) have flooded Africa's higher education (HE) sector with many promises. This paper aims to investigate the perceptions among African HE institutions regarding the potentiality of MOOCs as a tool to increase access to quality HE. A systematic review of papers in peer-reviewed journals published between 2013 and 2020 was conducted in academic databases and 15 papers were selected. Key findings reveal that MOOCs continue to make progress in the African HE sectors. Results also show that MOOCs are mostly used as a self-learning element supporting formal qualifications within African universities' frameworks. This practice allows only a limited number with resources to access higher education. Remarkably, most of the studies report a lack of awareness of MOOCs in African higher education institutions (HEIs). The results are contextual and the challenges and opportunities within the contexts of African and other developing countries' HE are varied; however, I would argue that MOOCs have gained global interest and thus sharing the perceptions and approaches that underpin MOOCs as a viable tool for increasing access to HE is an important part of moving this agenda forward in the sector.

Keywords: access to education; developing countries; massive open online courses (MOOCs); systematic review

1. Introduction

African higher education institutions (HEIs) face many challenges, such as the radically changing policy landscapes and the mandates to democratise and increase access to higher education. These changes have put pressure on most HEIs in Africa to increase intake and access to quality higher education. Statistics show that every year millions of young people who pass mandatory school-leaving examinations in African schools cannot be placed at universities. In Nigeria, for example, about 400 000 students out of 1.4 million who passed the mandatory Joint Admission and Matriculation Board (JAMB) examination in 2016 could not be placed in any Nigerian universities (Agbu, 2016). According to the Southern African Association for Institutional Research (SAAIR) (2019), out of a

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total of 661 116 pupils who wrote matric examinations in 2017 in public schools in South Africa, only 314 943 matriculants qualified for tertiary education, with 273 313 qualifying students aged between 18 and 29 years not being placed in universities. The Organisation for Economic Co-operation and Development (OECD) (2019) reported that in 2018, South Africa had the lowest ranking among all OECD and partner countries regarding tertiary education attainment for the 25-34-year-old age group. So what happens to the students who are not placed in post-school education institutions, especially those who at least qualify? How many of these students eventually return to the education mainstream? What measures exist to ensure that these students are eventually absorbed into the formal education systems in their countries and become better prepared for economic inclusion?

One of the challenges faced by developing countries is the high unemployment rate, and research shows that the young population is the most affected (Sever & İğdeli, 2021). Unemployment badly affects economic growth in any country. Fapohunda (2013) states that the unemployment rate in countries like Nigeria is alarming and a national embarrassment that needs meaningful and tangible action. Sever and İğdeli (2021) further explain that “social and psychological aspects and the economic dimension of youth unemployment” need urgent attention. According to Fapohunda (2013, p. 230), when “young people are provided with employment opportunities, they can become productive assets and participate in mainstream society, offering the best of their skills and talents”. Mehry et al. (2021) highlight that economic policy-making worldwide is largely focused on financial inclusion; however, financial inclusion will not happen without appropriate skills development interventions, some of which are best addressed through education. El Said (2017) points out some of the challenges that MOOCs can effectively alleviate, such as the “overcrowded classrooms, high costs of materials and books, commuting difficulty due to high traffic, and a need for continued education and specialised training for the workforce” (p. 7).

The emerging educational technologies and technological pedagogical innovations such as e-learning approaches and MOOCs that flooded the HE sectors in Africa and other developing countries promised to offer opportunities for the massification of education (Yuan & Powel, 2013; Zhou, 2017). Although MOOCs are still new and emerging (Zawacki-Richter et al., 2018), especially in Africa, they are responsible for a wide range of pedagogical discussions (Bozkurt, et al., 2017; Wang, Hall & Wang, 2019). African researchers acknowledge the disruptiveness of MOOCs in HE. This is evidenced by increasing debates and research on MOOCs. Historically, people enrol for MOOCs for various reasons, including curiosity, pleasure, personal and career development (Klobas, Mackintosh & Murphy, 2015). However, MOOCs have not yet been used as a tool to widen access to formal higher education for qualifying students. MOOCs have also taken the lead in open educational practices and the subject of research worldwide (De Rosa, 2018). However, although MOOCs have made their way into discussions around opening access to higher education in Africa and other developing countries (Oyo & Kalema, 2014), not much research is available on the role of MOOCs to widen access to formal HE in the African HE context.

Although MOOCs have received attention in higher education sectors, they have also received much pushback in the formal learning environment of HEIs (Czerniewicz, Deacon, Fife, Small & Walji, 2015), especially in Africa. This is due to the widespread outcry over issues with MOOCs accreditation (Kursun, 2016), lack of rigour in assessing learning (Hollands & Tirthali, 2014) and high drop-out rates (Hew & Cheung, 2014), among others. Accreditation and positive completion rates are important factors in higher education, and without them, HEIs and their courses lose the trust of key stakeholders. However, some universities already acknowledge MOOCs, not merely as an auxiliary resource but for accreditation towards formal programmes (Harris & Wihak, 2018). For example, transnational higher education in the United Arab Emirates uses MOOCs for accreditation prior to learning and programme delivery (Annabi & Wilkins, 2016). China has also integrated 'accredited MOOCs' into the formal curriculum (Wang, Hall & Wang, 2019). Therefore, exploring African countries' current perceptions and uses of MOOCs may help us to gain a better understanding of how universities could use MOOCs to widen access to HE for deserving students. This paper aims to systematically analyse and document existing research on how MOOCs in African higher education sectors are used to widen access to higher education.

2. Background literature

MOOCs are "free, easily accessible, completely online courses" with no entry requirements (FutureLearn, 2016, para 2). Usually, they are "university-level or training courses" (El Khadiri, Labouidya, El Kamoun & Hilal, 2019, p. 1168) that offer "online learning services, including learning communities, automated self-testing, peer reviews, and different certificates", although the certificates are mostly not for credit (Agbu, Mulder, DeVries, Tenebe & Caine, 2016, p. 112). Zawacki-Richter et al. (2018) point out that MOOCs are not independent and isolated from other open and distance learning (ODL) and educational technology developments but are "strongly tied to other developments in the field" (p. 243).

Open and distance education can contribute enormously to the massification of education and widening access to many deserving learners. There is a global movement towards open education's being established to fulfil specific governmental purposes and to address educational needs not fulfilled by traditional universities (Tait, 2008; Brenner et al., 2021). The initial thoughts behind open education were to make HE accessible to everyone. MOOCs are founded on the open universities' educational philosophy and attract a significant number of HEIs and private enterprises (Bozkurt et al., 2016).

Although MOOCs are still emerging in Africa, Nyoni (2013) believes that they are recognised as a game-changer for conventional and ODL universities. Most HE providers are expected to contribute to widening participation and promoting more learner-empowering educational practices (Orr, Weller & Farrow, 2018). Many universities offer blended education to non-traditional students (Tait, 2018; Weller, Jordan, DeVries and Rolfe, 2018). Schuetze and Slowey (2002, p. 312.) define 'non-traditional' students as "new groups of students who, for a complex range of social, economic and cultural reasons, were traditionally excluded from, or under-represented in, higher education".

While the expectation is that open universities will take the lead in widening access, campus-based universities are pressured to participate in open learning approaches and open educational practices (Subotzky & Prinsloo, 2011). Research indicates that most open universities are based in Asia and Europe, with Africa ranking third (DeVries, 2019). African universities are gradually embracing MOOCs, following in the footsteps of their prominent Western and European peers. The first MOOC projects in Africa were products of collaboration between African countries/organisations and an international body, for example the World Bank's SMART skills project in partnership with Coursera in Tanzania, which was launched in 2008 (Trucano, 2013). Other examples include edX and Coursera partnerships with Wits University (Bischof, 2017); Commonwealth of Learning with Nigeria (Marshall, 2016); and the Kepler project in Rwanda, launched in 2013 (Escher et al., 2014). However, Rambe and Moeti (2017) highlight "the academic elitism which manifests in the exclusive selection of top American universities to develop, host and deliver MOOCs" (p. 631).

Research shows that the highest MOOC completion rates are in developing countries. Mourdoukoutas's (n.d.) study revealed that low-income and middle-income populations make up 80% of MOOC users. Zhenghao, Alcorn, Christensen, Eriksson, Koller and Emanuel (2015) also reported that 40% of MOOC users are from developing countries, while Rambe and Moeti (2017) point to the scarcity of resources for many learners in African countries. Africa faces many highly researched challenges regarding technological advances within educational systems; however, many universities are finding ways to employ new technologies and continue to offer quality education. The reality is that growth in African countries' ICT sectors does not align with the "primary policy objectives of affordable access for all" (Nyoni, 2013, p. 666). While we acknowledge the impact and implications of these challenges for successful and effective online education through vehicles such as MOOCs, we should be cognisant of the many benefits of MOOCs for those who aspire to widen open education in their countries. These challenges are a serious barrier to Africa's fully reaping the benefits of MOOCs and other education technologies for their learners.

According to Materu (2007, as cited in Oyo & Kalema, 2014, p. 3), for various reasons, "the majority of students with minimum entry grades in Africa still cannot access higher education". Although the African student population is rapidly growing (USAID, 2014), sub-Saharan Africa is reported to have the lowest participation in higher education globally (Darvas, Gao, Shen & Bawany, 2017). African students need to be provided with quality and relevant education by African higher educational institutions (HEIs). However, "concerted effort at adopting MOOCs on the continent remain emergent and fragmentary" (Rambe & Moeti, 2017, p. 642). There is a need for African HEIs to experiment with different educational delivery models. Oyo and Kalema (2014) believe that MOOCs have been shown to be an effective innovation that can help unearth new best practices for online, face-to-face or blended pedagogies.

3. Methodology

This study aimed to document the empirical research on the perception and use of MOOCs and their impact on access to higher education in African contexts with

a view to understanding how MOOCs are currently being perceived and used by HEIs in Africa. A qualitative approach with a systematic literature review (Vaismoradi, Jones, Turunen & Snelgrove, 2016) was used for this study. Systematic reviews are founded on the principle of a comprehensive literature search to identify the available quality literature with a replicable search strategy as completely as possible (Hirt, Nordhausen, Appenzeller-Herzog & Ewald, 2020). Systematic reviews are also purposive. They study various topics by focusing on specific features of targeted literature and involve a rigorous and systematic research process of information searching (Newman & Gough, 2020).

Systematic reviews were first formulated in the field of medicine in response to the exponential growth in medical research, where the findings proved impossible to synthesise on given topics (Ramey & Rao, 2011). Increasingly, however, systematic reviews are being used to synthesise research to inform practice (Tamim, Borokhovski, Bernard, Schmid, Abrami & Pickup, 2021) in other disciplines, such as educational technology. Davies (2000) argues that educational policy and practice have much to gain from systematic reviews. Systematic literature reviews follow more formalised and rigorous processes than do other types of literature reviews, such as systematised literature reviews (Peters, 2017). They also create an unbiased synthesis from a great body of literature (Sayers, 2007) and assist in drawing conclusions from existing evidence (Koufogiannakis, 2012). A systematic review was necessary to establish the extent to which African HEIs' current research addresses the issue of widening access by using MOOCs.

3.1 Research questions

For this study, the researcher conducted a systematic review of the empirical literature (peer-reviewed journal articles). The researcher aimed to understand how MOOCs are currently being perceived and used by HEIs in Africa and how such approaches can enhance the use of MOOCs for entry into formal higher education. The study thus focused on the following two research questions:

1. What is the perception of MOOCs as a tool to widen access to higher education in African higher education institutions?
2. What is the status of MOOC usage in higher education institutions in Africa?

Although the first MOOC appeared in 2009, it was not until 2012 that the term became a buzzword and attracted significant policy attention in the international domain (Lane, 2013). Global MOOC research and trends only gathered momentum in 2013 (Bozkurt et al., 2016; Corbeil et al., 2018), after 2012 was declared "the year of the MOOC" by the New York Times (Shah, n.d.). Since it was around 2013 that MOOCs spread to some developing countries, only studies from 2013 to 2020 were included in this study, using the set inclusion/exclusion criteria presented in table 1.

There may be thousands of MOOC-related research papers, but relatively few address African issues and are produced by African authors. This review was intentional in including only works by African scholars to understand how they

perceive MOOCs and their viability in extending access to higher education to deserving learners.

Table 1: Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Empirical studies published between 2013 and 2020	Empirical studies published before 2013 and after 2020
Empirical studies published only in the English language	Empirical studies not published in the English language
Primary empirical research	Reviews or theoretical articles
Empirical studies focusing on higher education	Empirical studies focusing on basic education (primary and secondary/middle-school education)
Academic journal articles	Non-academic journal articles
MOOCs research focusing specifically on the widening of access to HE	MOOCs research that does not focus on widening access to HE
Articles authored by African scholars, including those collaborating with other scholars with a focus on African countries	Articles authored purely by non-African scholars
African HE context	Non-African HE context

3.2 Databases and search terms

Based on the research questions, background literature and with the help and support of a librarian from the University of South Africa's library, the search strategy was developed to identify the relevant studies (Gough et al., 2012; Bond, 2020) by using Boolean operators (AND, OR), expressed as (A1 OR A2 OR... A11) AND (B1 OR B2) (Lee, Watson & Watson, 2019). The search terms that were used to search for literature are presented in table 2.

Table 2: Search terms

A1. Access* to education A2. Open access A3. Higher education A4. Postsecondary education A5. Undergrad* A6. Postgrad* A7. E-learning A8. Online learning A9. Blended learning A10. Africa A11. Sub-Saharan countr*	B1. Massive open and online course* B2. MOOC*
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Sabinet, Scopus and Web of Sciences (WoS) databases were chosen for this research because of their credibility and breadth of coverage on topics in their collections. The search string and search terms are important in a systematic review to extract the relevant items for the research project and ensure the search's replicability (Polonioli, 2020).

3.3 Search results

The PRISMA guidelines are authoritative in guiding systematic reviews and they consist of a four-phase flow diagram and a checklist of 27 items developed to help improve the reporting of systematic literature reviews and meta-analyses (Bond, 2020). The PRISMA flow diagram forms an integral part of the methodological description of a systematic review (Haddaway, 2020) and outlines the identification, screening, eligibility and inclusion processes of items and reasons for study exclusion/inclusion. A total of 99 MOOC-related papers were retrieved, as illustrated through the PRISMA flowchart (figure 1), adapted from Moher, Liberati, Tetzlaff, Altman and the PRISMA Group (2009).

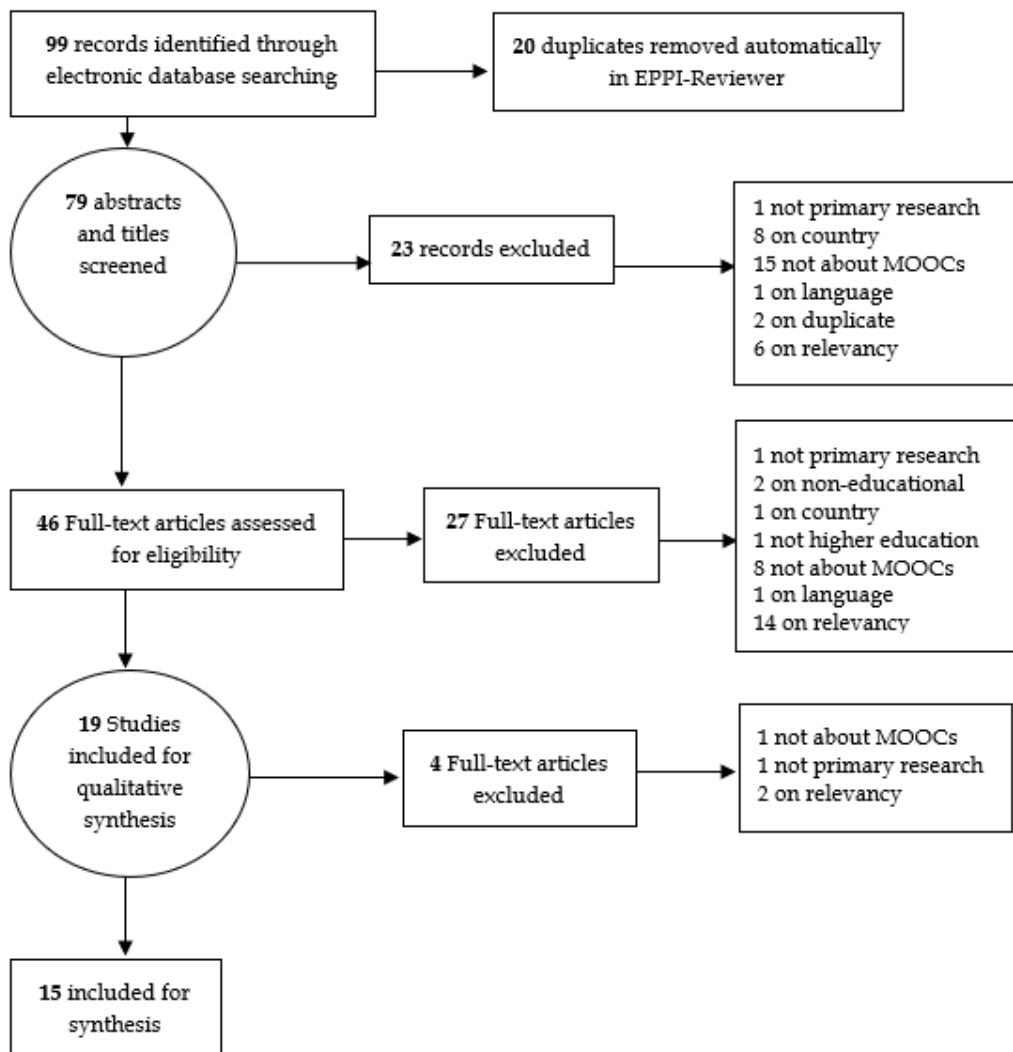


Figure 1: PRISMA flow diagram

Articles on the topic of MOOCs with discussions around widening access to higher education were searched in databases through the University of South Africa's library. After downloading the papers from the three databases, duplications were removed automatically using the EPPI-Reviewer software. EPPI-Reviewer software was developed in 1993 and is maintained by the EPPI-Centre at the Social Science Research Unit in the Department of Social Science,

UCL Institute of Education, University College London. It is a “web-based software program for managing and analysing data in literature reviews” (EPPI-Centre, 2021, para 1), suitable for small or large-scale reviews, including systematic reviews.

After applying the inclusion and exclusion criteria, the next step was to screen the papers based on their titles and abstracts. This step resulted in 23 articles being excluded. Forty-six (46) papers were then selected for full-text screening, which yielded 19 studies after excluding 27 (see figure 1). This iterative process yielded 15 relevant data extraction and synthesis studies in this systematic review.

3.4 Data extraction

Information about the use of MOOCs in higher education and how the researchers within the African HEIs perceived MOOCs was coded. Data from the included articles were extracted using a coding system designed with guidance from the coding systems developed by Bond, Buntins, Bedenlier, Zawacki-Richter and Kerres (2020). This coding system was chosen for its comprehensiveness and coverage of many important aspects of a study, including methodologies used, study design, samples, findings and study conclusions (Bond, 2020).

3.5 Data synthesis

Guided by the research questions and aim of this review, a narrative synthesis of the quantitative and qualitative data was undertaken, which – according to Petticrew and Roberts (2006, as cited in Bond, 2020, p. 6) – is a valid method of analysing and assembling evidence in systematic reviews. The quantitative data are presented in tables and figures, while the qualitative data are described narratively. Qualitative content analysis was used consistently and extensively in systematic review studies (Bozkurt, Keskin & De Waard, 2016; Zawacki-Richter et al., 2018) and was considered suitable for this study. Coding reports were generated and exported from EPPI-Reviewer to the researcher’s personal computer for further synthesis. Findings and emerging themes are discussed in the discussion section of this paper.

4. Findings

This section presents the findings of the systematic review and a discussion of the emerging themes, aligned with the research questions based on the included studies, namely a) the perception of the potentiality of MOOCs to widen access to higher education in Africa and b) teaching approaches applied using MOOCs in African higher education institutions. The first part of this section briefly discusses the study characteristics, including trends and a list of the included studies (table 3); the second part discusses the emerging themes.

4.1 Study characteristics

The studies included in the systematic review were conducted in eight different developing countries, mostly African countries. Three of the fourteen studies were a collaboration between an African country and at least one developed country (table 3). The internationally collaborated and co-authored articles were included in the study, based on the first author and his/her country of origin, the study setting and research focus. The collaboration trend of MOOC development projects and related research between developed and developing countries seems

to be increasing (table 3). However, many universities in some developing countries have started developing their own MOOCs. Two of the articles produced in Egypt were a collaboration with London (2016) and Spain (2018), respectively, while Nigeria collaborated with the Netherlands and India (2016) on another MOOC project. Another trend is that undergraduate and postgraduate students seem to be the most researched groups, as illustrated in table 3. MOOCs are also being used in the corporate sector for skills development in South Africa.

Table 3: A sample of included studies and their major themes

Author(s)/Year	Country	Sample focus	Study level	Major themes
Nyoni, J (2013)	South Africa	Lecturers	Postgraduate	Open access, ODL, SDL, skills development, MOOCs
Oyo, B & Kalema, BM (2014)	South Africa	N/A	N/A	Access to higher education, open education, African governments, MOOCs
Aboshady, OA, Radwan, AE, Eltaweel, AR, Azzam, A & Aboelnaga, AA, et al. (2015)	Egypt	Students	Undergraduate	Awareness and use of MOOCs
Agbu, JFO, Mulder, F, DeVries, F, Tenebe, V & Caine, A (2016)	Nigeria, Netherlands, India	Lecturers	Undergraduate Postgraduate	Digital openness, OERs, MOOCs
Hone, KS & El Said, GR (2016)	Egypt, London,	Students	Undergraduate Postgraduate	DE telelearning, MOOCs
El Mhouti, A, Nasseh, A & Erradi, M (2016)	Morocco	N/A	N/A	Drop-out rates, engagement, MOOCs
Czerniewicz, L, Deacon, A, Glover, M & Walji, S (2017)	South Africa	Lecturers	Institutional skills development	Open practices, OERs, MOOCs
El Said (2017)	Egypt	Students	Undergraduate Postgraduate	MOOC retention and design
Liyanagunawardena, TR & Aboshady, OA (2018)	Egypt	Healthcare professionals	N/A	Training and professional development, MOOCs
Alonso, JLG & Samy, D (2018)	Egypt, Spain	Students	Undergraduate Postgraduate	International cooperation, capacity building, MOOCs

Fianu, E, Blewett, C, Ampong, GOA & Ofori, KS (2018)	South Africa, Ghana	Students	Undergraduate Postgraduate	Technology adoption, computer self-efficacy
Deacon, A, Walji, S, Jawitz, J, Small, J & Jaffer, T (2019)	South Africa	Established professionals	Corporate/ Skills development	Flexibility, online learning, institutional capacity
El Khadiri, K, Labouidya, O, El Kamoun, N & Hilal, R (2019)	Morocco	N/A	N/A	Access to higher education, SDL, MOOCs
Small, J, Deacon, A, Walji, S, Jaffer, T & Jawitz, J (2019)	South Africa	Corporate professionals	Postgraduate Corporate/ Skills development	Transitions in work, skills development, MOOCs
Waghid, Y & Waghid, F. (2017)	South Africa	Students & university educators	Undergraduate Postgraduate	MOOCs, disrupting HE curriculum and pedagogy, rhizomatic thinking

The results from the reviewed literature reveal a general increase in MOOC-related research between 2016 and 2019 in Africa (figure 2), five years after the hype of MOOCs emerged globally (Bozkurt, Keskin & De Waard, 2016).

The highest number of MOOC-related research studies were produced in 2017 in an African HE context (figure 3), with the topics ranging from building capabilities through MOOCs, MOOC-making and open educational practices, and perceptions and use of MOOCs in developing countries' universities.

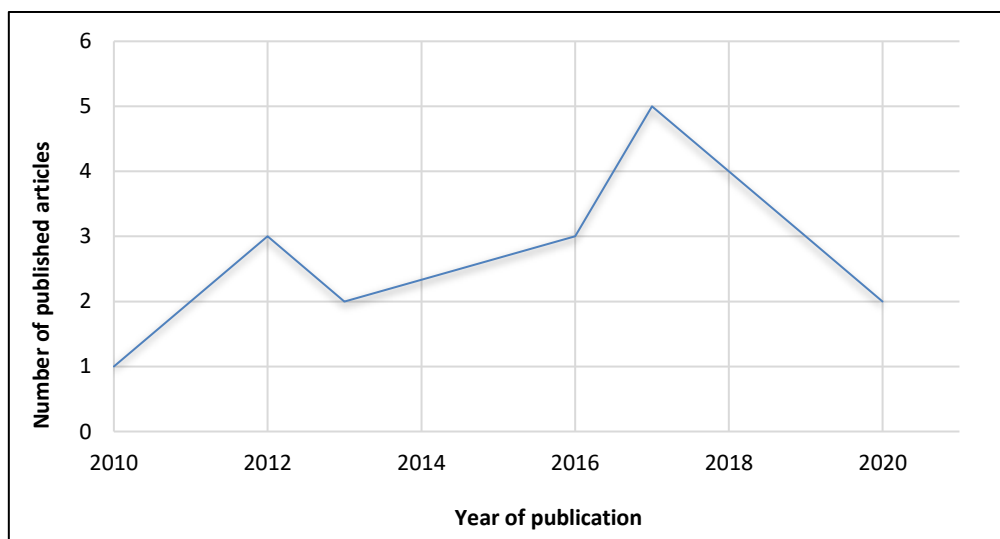


Figure 2: Number of articles by year of publication

South Africa appears to be the top generator of MOOC-related research, followed by Egypt, as depicted in figure 3. Although this study was of a small scale, it

correlates with the study of Escher, Noukakis and Aebischer (2014), who also found that Egypt, South Africa, Morocco, Tunisia and Nigeria had the largest geographical distribution of MOOC participants from African countries.

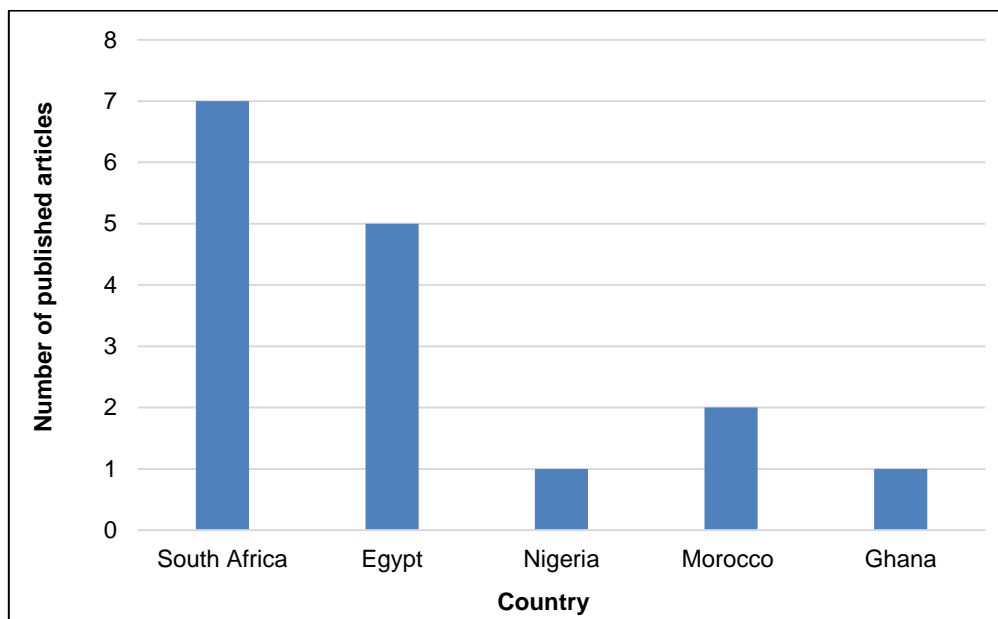


Figure 3: Number of articles per country

Based on the studies selected for this review, there seems to be very little research from African HEIs that focuses on how MOOCs can be used to help the masses of learners in Africa to access higher education. This finding is supported by the included study of El Said (2017), who reported that the population of Egypt appeared to be underrepresented and under-researched with respect to MOOC participation. Most articles in the MOOC research, as indicated in table 3, reported on topics such as the flexibility of MOOCs, student engagement, self-regulated learning and drop-out rates, except for the study of Oyo and Kalema (2014) and Agbu, Mulder, DeVries, Tenebe and Caine (2016), who discussed the possibility of MOOCs as tools to increase access to higher education. The next section presents the emerging themes based on the research questions from the studies included in the systematic review.

4.2 Themes

4.2.1 *The perception of the potentiality of MOOCs to widen access to higher education in Africa*

This theme looks at how African HEIs view the value and role of MOOCs in increasing access to higher education for the masses that cannot access it, for whatever reasons, as reported in research. Of the 15 reviewed papers in this research study, only two studies by Agbu et al. (2016) and Oyo and Kalema (2014) reported on the potentiality of MOOCs' being used for access to higher education. Oyo and Kalema (2014, p. 2) firmly believe that "a good design of MOOCs could widen HE access to disadvantaged students in Africa, thereby promoting holistic economic emancipation". Agbu et al. (2016, p. 117) also reported that MOOCs are seen as an alternative with "great potential benefits of widening access to quality

higher education in Nigeria”, with the National Open University of Nigeria (NOUN) driving OERs and OER-based MOOCs.

El Said (2017) reported that MOOC participation in the Egyptian population was underrepresented and under-researched; however, he points out that "MOOCs can provide innovative solutions to education problems in Egypt" (p. 7). Although Waghid and Waghid (2017) contend that MOOCs may “not strictly advance equal access and inclusion”, they also believe that MOOCs “have the potential to cultivate student capacities in a critically transformative way” (p. 1).

Research suggests that MOOCs are already being used as part of mainstream credit-bearing courses in some institutions (Small et al., 2019) in other developing countries, such as the Philippines, Thailand and India which – at national levels – are already crediting MOOCs for entry into formal university education (Harris & Wihak, 2018). Transnational higher education in the United Arab Emirates reportedly uses MOOCs to credit students’ prior learning (Annabi & Wilkins, 2016).

4.2.2 Lack of awareness of MOOCs in Africa

One of the important key challenges that African HEIs face is the prevalent lack of awareness of MOOCs. Several studies in this review reported that many learners and teachers were not aware of the existence and provision of MOOCs. For example, the study by Aboshady et al. (2015) reported on the lack of awareness and use of these courses in Egypt. Alonso and Samy (2018) found that most students are unfamiliar with MOOCs, and those who knew about MOOCs had heard about them from friends and social networks. Small et al. (2019, p. 429) also reported that MOOC-takers “already possess some level of education”, meaning that access is available to a limited few, most of whom already have a post-school qualification. Oyo and Kalema (2014, p. 1) believe that African HEIs face a “new era of universal access to HE that is achievable through MOOCs only if the respective governments meet initial requirements”. This requires that awareness be instilled at the national level and cascaded down to all stakeholders, including the schools. El Khadiri et al. (2019) argue that MOOCs deserve the full attention of the higher education community, including decision-makers, teachers, students and researchers, “given their importance in the democratisation of knowledge (free and open to all)” (p. 1167).

4.2.3 The status of MOOC usage in higher education institutions in Africa

This review found that MOOCs in African HEIs are mainly used as a supplementary resource to traditional education. The studies of Annabi and Wilkins (2016) and Reich and Ruipérez-Valiente (2019) found that MOOC providers are partnering with the HEIs to use MOOCs to supplement university programmes. Escher et al. (2014) argue that MOOCs can be used by faculty in universities to ‘flip the classroom’ as an auxiliary resource. MOOCs in the African HE context are still seen as secondary resources. MOOCs seem to be used mainly to complement traditional education or as part of a university programme and as a self-learning element (McAuley et al., 2010; Alonso, 2018; Czerniewicz, 2017).

In some cases, MOOCs involve face-to-face tuition and support for university students. For example, Fianu et al. (2018, p. 8) reported that in South Africa and Ghana, “university-based students are given MOOCs as extra tuition support”. El Said (2017) believes that “using MOOCs as a learning opportunity within the context of a university-accredited programme would increase the likelihood of completion” (p. 2). However, Zhenghao et al. (2015) report that completing a self-learning MOOC remains optional for graduate and undergraduate students, effectively measuring completion and drop-out rates in such learning contexts.

5. Discussion

Based on this review, the idea already exists in countries such as Egypt, Nigeria and South Africa to use MOOCs to grant access to formal higher education. Although MOOCs lack formal credit value and do not always lead to formal qualifications, research suggests that they are already being used as part of mainstream credit-bearing courses in some institutions (Small et al., 2019) in other developing countries. However, there is little evidence in studies of African universities’ considering using MOOCs to open access to formal qualification programmes for students. MOOCs have thus far been used to complement traditional education (Yuan & Powell, 2013; Zawacki-Richter et al., 2018) and are also offered to university-based students as extra tuition support (Fianu et al., 2018). When MOOCs are used in face-to-face scenarios as part of tuition and student support, as reported in the findings, the ubiquity of MOOCs becomes questionable and further increases the education access divide. Access to the large numbers of MOOCs offered as supplements to university programmes is questionable, as these MOOCs are often offered only to the university’s cohort of registered students.

HEIs are seemingly the “main drivers of MOOCs, at least from the perspective of the developed countries where MOOCs are thriving” (Oyo & Kalema, 2014, p. 9). There is a need for HEIs to initiate dialogue with governments and accreditation bodies in African countries on how MOOCs can be utilised innovatively, perhaps as part of the recognition of prior learning (RPL), to help millions of learners gain access to further training in the form of university education. University leadership also needs to encourage staff to teach actively with open content (Agbu, 2016; Czerniewicz et al., 2017), including MOOCs. Active and constructive discussions around this topic and sharing relevant knowledge and innovations could help to widen access to higher education using MOOCs.

Although there is an increase in MOOC-related research within the African context, the prevalent lack of awareness of MOOCs reported in six of the fifteen studies included in this review is of serious concern. More effort is needed to raise awareness among the relevant stakeholders, starting with those in the ministry of education at government level, HEIs, lecturers, students and other stakeholders. The increase of MOOC-related research in African universities is inevitable, considering the publicised promises of MOOCs and their potential to make it possible for universities to reach students in the most inaccessible and deprived parts of their continents. However, this increase in MOOC research in Africa deals with issues previously dealt with in the Western and European studies on

MOOCs, except for challenges unique to African countries and other developing countries, such as basic digital infrastructure, electricity supply, internet connectivity (Rambe & Moeti, 2017) and, in some cases, a lack of digital skills on the part of both lecturers and students.

Most of the MOOC research conducted in Africa between 2013 and 2020 mainly reported on the lessons learnt from the MOOCs designed and offered within a formal qualification programme at a university. Some MOOC-related research is reported within the confines of government-led training programmes and in private and corporate organisations. However, there is little reporting on how MOOCs can be used to expand access to formal education to millions of students in African countries. The production of MOOCs in Africa, although linked to a formal programme offered at a university, is a phenomenal achievement at this point. MOOC production and research collaborations with international organisations embody the much-needed technical skills transfer, but there is also a need for African HEIs to start producing MOOCs that speak to the heart of Africa and that help to solve some of the longstanding issues relating to HE access in Africa.

6. Conclusion

The increasing research is evidence of interest in MOOCs among HEIs. This study aimed to investigate the perceptions among African and other developing countries' higher education sectors regarding the potentiality of using MOOCs as a tool to increase access to quality higher education. The study undertook a systematic review, which revealed the conflicting views on MOOCs in existing research. Some institutions have already started using MOOCs as a pathway to formal education, whereas other institutions prefer to use MOOCs only as a supplementary element. The study also revealed the potentiality of MOOCs to expand access to higher education; what is needed now is increased awareness campaigns and dialogues between African governments and HEIs. The implications and recommendations in this study may further increase research and dialogues around the use of MOOCs as tools to introduce more learners to quality higher education.

7. Implications and recommendations

While research produces volumes of data on MOOCs, there is comparatively little research on how MOOCs can be used to widen access to formal education in higher education for the masses, especially in the African HE context. The systematically reviewed literature in this paper highlighted the trends and issues that may directly influence African HEIs' use of MOOCs to grant millions of learners access to higher education. The review revealed a lack of awareness of MOOCs among African HEIs. Thus, governments who aspire to widen access to higher education through MOOCs need to raise the awareness of every stakeholder, including high school communities, HEI educationists, policy-makers and government.

The universities that offer MOOCs as part of a degree programme are commendable in realising the role and value of MOOCs in widening access to

education for the masses. However, HEIs – in collaboration with governments, authorities and regulators – need to assess their preparedness to use MOOCs as a means to grant learners access to higher education, as well as the implications for degree programmes.

Further research unpacking and sharing information and experiences of the potential positive effect of utilising MOOCs for accreditation purposes may help increase the value of MOOCs. This research may further make relevant authorities aware of MOOCs' significance leading to a massive utilization among African HEIs.

There is a suggestion that MOOCs can work better if packaged with recognition of prior learning (RPL) programmes (Oyo & Kalema, 2014; Annabi & Wilkins, 2016) to open access to higher education for individuals who would otherwise not have access to it. This is one possibility and further dialogue and research can unpack how this could be achieved. In addition, research on how MOOCs can be used in widening access to HE in the African higher education sector in the post-COVID-19 pandemic era might be of interest and might produce useful insights for both practitioners and policy-makers.

8. Study limitations

Shenton (2004) cautions that qualitative research results must be understood within the context of the characteristics of the case. The findings of systematic reviews are often limited to the research in the included papers, based on the study's inclusion and exclusion criteria. Nonetheless, the lessons learnt from this study are relevant to various stakeholders, including HEIs, education policy-makers, local and international MOOC developers and anyone interested in MOOCs in African HEI contexts. The study's results should thus be understood within the context of African HEIs' approaches to MOOCs and based on the papers included in this review.

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