Chapter 17:

Questioning the Effectiveness of Distance Education in Africa: Future Actions for Research and Practices

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Introduction

In this chapter we explore trends in research in Africa related to distance education, which is a viable model of providing education to all and attaining Sustainable Development Goal 4 (SDG4). Distance education has been conceptualised in various ways by several scholars and researchers and referred to it in terms such as correspondence education, distance education, open distance learning, technology-enabled learning, and online learning. It has also been referred to as distance teaching, open teaching, or flexible learning which tends to describe its nature at specific times and places. This chapter uses distance education to cover all the diverse terms for purposes of uniformity and to reduce confusion.

Burns (2011) traces distance education to correspondence courses in Ireland in 1939, where print text was studied by candlelight to the current advanced online learning. The experience of Ireland in 1939 are not foreign experiences for many people in sub-Saharan Africa in the twenty-first century due to many challenges regarding access, such as lack of electricity and internet connectivity. Jenkins (1989) also points out that distance education is not new in Africa. Several countries had national distance education programmes from the 1960s when many sub-Saharan African countries achieved political independence; formal education had been introduced by missionaries and colonial governments, but it was underdeveloped and not accessible to all. Jenkins (1989) explains that at independence many African countries viewed education as a vehicle for individual and national development, but it was costly and not inclusive; therefore, distance education came to be viewed as a low-cost alternative to the conventional provision of education

rather than a complement offering courses to those who wished to advance learning or require specific skills. Questions linger why it took so long for distance education to be widely used even in its earliest form of correspondence which had fewer barriers.

In sub-Saharan Africa, distance education take-up had slowed in recent years, but it was forced in due to COVID-19 protocols of maintaining physical distance and closures of education institutions so that it became the safe mode of delivery for learning continuity. A perceived gap of the quality of education during the COVID-19 pandemic exists which requires more research. Still parts of Africa lag in development of distance learning technologies while other parts are highly developed: this has resulted in the identification of several challenges including digital divide, limited technology access and skills, home environments which are unsuitable to learning, and limited resources (Coughlan et al. 2021). Another explanation for slower take-up could be that shifts to online teaching and learning are complicated and require a combination of skills regarding pedagogical, technological, administrative, and strategic elements.

We explore trends in distance education research in Africa grounded on connectivism, a theory for a digital age where technology tools positively influence the learning landscape allowing for collaborative learning and learner engagement which help to promote critical thinking and other twenty-first century skills (Siemens 2005). Content was analysed focusing on the following themes: students' access to distance learning in Africa, use of open educational resources (OER) and other technologies that support distance learning in Africa, student and staff support in accessing distance learning in Africa, education law and policy governing distance education offered in different modes in Africa and data mining research in Africa

Use of open educational resources (OER) and other technologies that support distance learning in Africa

Open educational resources (OER) can provide critical support to teaching and learning in sub-Saharan Africa where educational resources are scarce. According to Thakrar et al. (2009) in their research 'Harnessing Open Educational Resources', the challenges of teacher education in sub-Saharan Africa include: teacher shortages, unqualified teachers, and lack of learning resources, among others. Teacher education in sub-Saharan Africa (TESSA) and OERs exist to address such difficult circumstances. Wright and Raju (2012) suggest that OERs have the potential to reduce costs, improve quality, and increase access to educational opportunities. Expounding on the use of OER, Zinn et al. (2009: 7) reported that at the University of Winneba, Ghana, 'students, formed a TESSA club. They would meet weekly in the university campus to discuss TESSA materials and their experiences of using them'. They also reported that students from the University of Pretoria

were required to use TESSA resources during their teaching practice, reflect on their experiences in groups, and conduct individual surveys at the end of their practicum. In Ghana, TESSA educational resources were accessed through shared institutional computers during short, regular, scheduled sessions. More recent research may find a different situation in the universities and would give a current perspective of what is happening now, especially after COVID-19.

Percy and Belle (2012) in their study 'Exploring the Barriers and Enablers to the Use of Open Educational Resources' established that despite effort to develop high quality OERs, academics in Africa are largely not using the OERs, though Africa faces poverty of academic resources. Access of OERs is tightly tied to technology and skills to use it which negatively affects their intention to use OER. This article, therefore, makes it clear that there is a need to address technology infrastructure and skills alongside others such as copyright attitudes, culture, and others so that there could be a more widespread adoption of OERs in Africa.

A study by Hart et al. (2002) aimed at providing baseline data on the uptake and success of mainstreaming OER at an open distance learning institution to determine the maturity of the staff in adopting and engaging with the OER initiative. The study established that there had been progress in achieving OER adoption, however, the process had been slow. In addition, it was confirmed that while there were some pacesetters who quickly adopted innovations and had moved towards the decision and implementation stage, quite a number of the staff needed encouragement in order to use OER and ensure sustainability. Challenges faced in OER adoption included insufficient ICT infrastructure and policy issues which affect the utilisation of OER. There is therefore a need to provide staff with skills and knowledge to confidently engage and mainstream OER in teaching and learning. The findings in this article reflect the fact that most African institutions of learning were still grappling with embracing OER and especially becoming part of mainstream education in the African learning institutions.

More recently, Stutchbury (2019) explains that TESSA developed a resource bank comprising 75 OER-designed work units, in general suitable for delivery of primary school curricula for use in different African countries and targeting the primary school level. The resources could help teachers to adopt more learner-centred approaches which the teachers never experienced but which are now central in the Kenya competency-based curriculum. In agreement with Stutchbury, Wambugu, and Keraro (2020) point out some trends in development and coverage of TESSA OERs in Egerton university, Kenya, which show that TESSA OER for sub-Saharan Africa were developed for primary schools, and following a successful implementation moved to secondary school level. They also reported that TESSA OERs materials are used by science teacher educators in Egerton University

for classroom teaching and learning to enhance pedagogical skills of pre-service teacher trainees during subject methods training, micro- teaching lessons, and practicum. The student-teachers are then expected to use TESSA OER in secondary schools when they start practising teaching full time. That will bring about a widespread multiplier effect of the OER by spreading their use to schools because university students are recruited to university from across the country. There is a need for research to determine how well the student-teachers implement OER roll-out across the country once they leave university.

Two questions are important here: (a) How often and how well are the resources being used in Africa as explained? (b) Are there factors that may hinder a teacher from using the resources? Research could explain the real use of the OER in schools and higher education institutions in the different sub-Saharan African countries. There is also a need for awareness creation of existence of OER by educational institutions and how to use them to support implementation of the official curriculum documents to strengthen delivery by embedding learner-centred approaches.

Education law and policy governing distance education offered in different modes

Policy is critical for development and implementation of an educational programme such as distance learning for quality, uniformity and structured implementation, assessment accreditation, and growth. The quality assurance is meant to demonstrate to internal and external stakeholders that the university practices are professional and credible, and that the quality of graduates that are produced is high as described by Aluko et al. (2022). Policy needs to guide learning in the distance education mode to ensure that the work by students is their own, among other issues. There is also a need for policy to control the different, varied names given to the distance education mode of delivery. There is a need for policy to guide the varied teaching methods, structure of the programmes, and content organisation (Badat 2006). That could be achieved when clear policies are in place. There seems to exist a huge gap in distance learning policy in Africa. Makokha and Mutisya (2016) conducted their study in public universities in Kenya and assessed the status of e-learning in public universities in Kenya. They surveyed seven universities and triangulated outcome data with interview schedules and focused group discussions. Participants were randomly selected and included lecturers and students. Their research reported that a majority of the public universities did not have a policy approved by their Senates. e-Learning had not yet been fully adopted as a

mode of delivery and there was no significant effort to improve the situation. Overall, the situation did not encourage uniform and structured implementation and growth of eLearning in most of the public universities. Braimoh and Lekoko (2005) call for a discussion to interrogate the need for policy in distance education for the south African region which would safeguard the quality of education delivered through distance learning mode. They reason that there exists a diversity of culture, economic endowment, and geographical locations, and policy would guide development of the emerging and older distance education institutions in the region.

Onwe (2013) examines current policies and practices of ODL models in sub-Saharan Africa to identify the best practice for a sustainable education. He argues that no sub-Saharan African country has been able to provide education for all through the traditional mode and points out that ODL may be the alternative mode of delivery to facilitate achievement of this noble goal. Onwe further reported that in Nigeria there is some mismatch between policy and practice and the findings indicate a dire need for sub-Saharan African countries to embrace distance education, highlighting areas which include management and administration, curriculum design, course materials development and production, quality assurance, learner support services, and the use of information technology as the variables which determine the effectiveness of ODL models in the sub-Saharan African countries in which the countries have not yet shown positive progress. The author argues that the major challenge is lack of expertise in the area, lack of documentation, and lack of training of human resources.

Modern technology is a great enabler of distance education. Information communication and technology (ICT) policy spells out frameworks and standards for rolling out certain infrastructure such as broadband in a country, as well as access and use. It also sets out how services should be made accessible online, and other aspects like a cyber-security policy which provides the measures and procedures by which public assets and infrastructure can be protected against malicious cyber-attacks (Phamodi et al. 2021). Development of policy in ICT appears more promising than in distance education. Adomi (2010) conceptualises ICT policy as an official government document which spells out the objectives, goals, principles, and strategies intended to guide and regulate the development, operation, and application of information and communication technology and argues that policy facilitates the creation of an enabling environment for the positioning of ICTs and their use and development of ICT infrastructure to facilitate distance education.

The sub-Saharan African countries each needs to develop an ICT policy considering each country's vision which aligns with the international goals and the United Nations Sustainable Development Goals (SDGs). Nyerere et al. (2012) pointed out that the first Kenyan government

policy guiding distance education in higher education was the Act of Parliament of 1966, which established the Board of Adult Education. After independence in 1963, distance education was conceptualised as an alternative mode of education provision in Kenya. The sessional paper No. 1 of 2005 (Republic of Kenya 2005) recommended the establishment of an open university and the use of distance education in training at all levels. Institutions in Kenya could use the distance education mode at all levels of education provided they develop their own ICT policy (Juma 2003). In this respect Kenya developed and adopted a National ICT Policy in January 2006. It is clearly stated that the government will encourage the use of ICT in schools, colleges, universities, and other educational institutions in the country for improving the quality of teaching and learning. The Kenya ICT Policy provides clear guidelines on availability, accessibility, efficiency, reliability, and affordability of ICT services. Strategies suggested are to promote the development of eLearning resources, facilitate public-private partnerships, mobilise resources to support eLearning initiatives, promote the development of an integrated e-learning curriculum to support ICT in education, and to promote distance education and virtual institutions, particularly in higher education and training (Farrell 2007).

In response to the demands of Sessional Paper No. 1 of 2005, the Kenya government prioritised mainstreaming of ICT in the teaching-learning process in the Kenya education development plan. A gap exists because despite the described efforts, teachers still have not exhibited mastery of integration of ICT in teaching and learning (Barasa 2021). The Kenya ICT policy of March 2006 was reviewed in November 2019 to align it with the new constitution of Kenya of 2010 and the Kenya Vision 2030. The review aimed at incorporating the lessons learned from the Vision 2030 Medium Term Framework, with close reference to the three underlying pillars of Vision 2030 (economic, social, and political) and the United Nations Sustainable Development Goals (UNESCO SDGs). The focus was to provide access to ICTs, especially broadband, to all Kenyans. The question is whether all Kenyans were provided access to ICT given the fact that many school children could not access learning during COVID-19 school closures despite the many interventions and efforts (UWEZO 2020).

Students' access of distance learning in Africa

There is evidence that some students have had access to distance education for a long time because it is not new in Africa, and it went through different phases. Jenkins (1989) compares distance

education trends in 39 countries of sub-Saharan Africa and points out that distance education is not new in Africa. In southern Africa, the University of South Africa (UNISA) was founded in 1873 and became the world's first university dedicated to correspondence delivery of learning in 1951, and since then the university has enabled many Africans across the regions to obtain degrees furthering their education. From the 1960s when many sub-Saharan African countries achieved political independence many Africans ministers of education viewed education as a crucial means of advancing their countries' national development which had been underdeveloped by colonialist. Many of them conceptualised distance education as a low-cost alternative to the conventional education rather than a useful additional mode to provide supplementary educational opportunities to adults desiring to further their education and acquire needed additional and new work skills. To Jenkins, the ministries of education saw the correspondence study potential as a means of expanding educational opportunities and of providing trained human resources especially at secondary level and for training the many unqualified primary school teachers: it was for this purpose that governments first acted. Zambia and Malawi set up National Correspondence Colleges in 1964 and 1965 respectively. The World Bank too used distance education for teacher professional development especially in providing in-service training to primary school teachers to strengthen teaching skills in their subjects, by supporting them through radio programmes, and for expanding secondary education cheaper than through conventional means. The gap remains as to why in many parts of Africa distance learning has not grown significantly despite its long presence in the continent.

COVID-19 pushed distance education to online learning, what Michael Agyemang Adarkwah (2021) calls 'outbreak of online learning', which helped learning to be sustained. Governments declared that all learning should go online to avert the spread of COVID-19. Research by Wotto (2020) in Canada, USA, and France also confirmed that growth of distance learning in the form of online learning in Africa and the rest of the world was heightened by the COVID-19 pandemic. In observation of the Ministry of Health protocols and the sudden closure of all learning institutions in 188 countries, about 91 per cent of the students worldwide were locked out of learning institutions (UNESCO 2020) and online learning was the technology for continuity of learning. According to Abera (2023), although this led to the growth of online learning, it also revealed the existing digital divide in education in most countries but especially in sub-Saharan Africa which threatens attainment of the Sustainable Development Goal Four (SDG4). The evolving information and communication technology occasioned with COVID-19 creates the expansion of education access (Marguerite Wotto 2020), but only about a third of the population in Africa has access to reliable

internet connectivity. This situation is expected to have improved after the COVID-19 outbreak which brought about a kind of 'outbreak' of online learning. Notwithstanding these, technology-enabled learning such as online learning is seen as the most feasible and economically sound means of expanding access to quality higher education (Asunka 2008). The take-away point from Aluko (2022: 12) is that 'the experiences in 2020 and 2021 could be an opportunity to reimagine and reshape a different future for ODeL. Caution must be taken not to simply revert to suboptimal pre-pandemic teaching and learning practices after the pandemic is over'. Therefore, lessons from school closures should make us come up with innovative resilience measures for education.

Despite the challenges, the demand for learning to go online saw advancement in technology-enabled learning in many learning institutions in sub-Saharan Africa, and training on online learning in the form of Massive Open Online Courses (MOOCs) increased, hence increasing access to online learning. Adakwa (2021) reports on the online outbreak after COVID-19 and points out that online learning advanced access to learning because learners could access learning regardless of geographical separation. Hence, online learning has great potential in making the achievement of sustainable development SDG 4 possible by reaching out to learners from different corners, without exclusion.

With the growth of online learning, distance education goes beyond access because the technology tools in online learning enable learner engagement in learner-centred approaches which deepens learning. Scholars have reported further trends that video conferencing has helped educators in Africa to deliver more personalised learning experiences to students on a distance education programme (Mendy and Madiope 2020), though the cognitive and psycho-social approach to student learning may not be fully met. This advanced trend has been experienced in the expanded use of platforms such as Zoom and others which have expanded in Africa following the COVID-19 crisis, and came as a blessing during the calamity and seems unlikely to completely frizzle out. However, questions on gains of the online learning during COVID-19 school closures remain questionable for many clients. A test of the effectiveness in learning at the height of the growth of online learning could be demonstrated by the findings of a study in Kenya conducted by UWEZO (2020) to establish whether school children were learning using technology during the COVID-19 school closure. The study was conducted in 86 out of 335 sub counties across 42 out of the 47 counties in Kenya. It targeted 10 281 school children distributed from the lowest class, ECDE baby class for three-year-old children to secondary school, form four. The key findings were that access to digital learning was low and inequitable: on average 22 out of 100 learners were able to access digital learning. Higher grade children accessed digital learning better than the lower grades.

Children in private schools had greater access to digital learning than those in public schools, 42 out of 100 children used television for learning, 27 out of 100 accessed WhatsApp mails sent by schools, nineteen out of 100 accessed radios, and ten out of 100 accessed the Kenya Institute of Curriculum Development online resources. The existing gap is whether there has been change to better use of distance learning. The study indicates that many children were not able to access learning in schools. It appears that primary and secondary school technology-assisted learning did not pick up during the COVID-19 pandemic school closure. A major reason could be that the learners were not facilitated to access the platforms. There is a need to investigate further what really caused the reported situation for future purposes.

In their study, Mendy and Madiope (2020), using document analysis, presented current trends in distance education in higher education in South Africa during COVID-19, which indicated development in areas which deepen learning. There was strengthening of remote learning which facilitated students to enrol in an online environment. Discussion boards were strengthened, which could allow students to freely express their opinions. Video conference platforms and audio-visual platforms such as Zoom were developed, and learners could engage with one another. Social media such as Instagram was also used for instruction. The question is whether all learners in the country were included or whether some were excluded in learning. Another question is whether the trends will be sustained in an environment where the traditional mode of face-to-face is possible—for example, in 2022 when COVID-19 measures were relaxed. However, the study gives an indication and hope that with facilitation, access to technology-enabled learning improves learning and enables provision to be more personalised.

Student and staff support in accessing distance learning in Africa

Student support services is a necessary strategy to facilitate effective study through distance education mode and complete education courses for most students because the mode is a solitary, independent, self-paced, strenuous undertaking which without the requisite student support system and personal drive may lead to non-completion. Some years ago, Tait (2003), in an interrogation on how changes have taken place in distance learning, points out the inclusion of student support and explains that when the university of South Africa was established as an open and distance learning university it accepted Black and Coloured students who had been excluded from the conventional institutions by the apartheid South Africa regime of the time. He discusses other

universal student support systems which include flexibility offered by ODL, embracing cognitive, affective, and systemic support. More recently, Maimana (2016) concludes that all students need academic support and development and adds to the list of areas of student support: educational advice, study skills, computer assistance, entrepreneurship, and financial aid. In the University of Nairobi, Kenya, student support was offered through resources in centres spread out in different locations for easy access (Nyerere et al. 2012). However, there is a gap of knowledge of the exact gains in uptake of online learning and whether it is sustained.

Lekhetho (2022) conducted a case study to investigate Ethiopian students' perceptions of student support services provided by the University of South Africa focusing on Ethiopian doctoral students taking their studies in the College of Education of the University of South Africa (UNISA). Citing Mays and Aluko (2019), Lekhetho reports that in Unisa's mode of distance learning delivery for students, access has transformed from print to a blend of print and online support that mitigates the lack of student-lecturer interaction in face-to-face learning environments. The blend provides for technology-enabled interaction which reduces loneliness and is a source of student support because it has capacity to promote meaningful student engagement and peer support through use of technology tools such as WhatsApp which allow students to connect and learn. The study's results indicate that the participants were satisfied with the administrative support which they received, especially the co-operation from their supervisors. They explained that there was good communication and adequate response to their issues and concluded that the academic support provided was very good. Annual research workshops organised by the university helped to answer their questions in research methodology, postgraduate procedures, and enabled them to interact freely with their facilitators. The students, however, experienced challenges which included unreliable internet connectivity, insufficient income, and other life-competing priorities as adult learners, as well as lack of recent publications—all they found were old publications in the library and book-lending period.

This reflects the challenges faced by students taking distance learning studies in Kenyatta University and University of Nairobi in Kenya. In a study by Nyerere et al. (2012), it was found that students suffered challenges of inaccessible technology; limited teaching-learning resources; and demoralised, untrained facilitators who were also overworked and poorly remunerated. The course facilitators felt discouraged and suffered burnout. In other parts of sub-Saharan Africa, a serious challenge of distance education was low levels of facilitator motivation.

Research conducted by Couglan et al. (2021) found that staff in higher education in Ghana, Kenya, Nigeria, and South Africa lacked essential knowledge, skills, and primary tools for technologically

mediated connection between them and the students supplied by their workplaces. Pedagogical decisions were challenging and full adoption of online learning had been slow, citing challenges such as lack of training, heavy workloads, and negative attitudes. The latter played the greatest role because with positive attitude, teachers elsewhere played a great role in adoption of technology for teaching and learning (Kisirkoi 2015). A new study might find a changed situation due to the trends towards massive online learning during the COVID-19 pandemic and introduction of interactive technologies.

Data mining

Educational data mining is an application of data extraction processes of educational data and is concerned with developing methods to establish the types of data to improve the understanding of the learners and the context in which they learn (Romero and Ventura 2010). Studies by Ferguson (2012) investigated the relationship between learning and educational data mining by concentrating on challenges such as connectivity with the learning sciences, development of ways to handle a broad range of datasets, learner participation, and establishment of ethical guidelines. Fynn and Adamiak (2018) state that data mining is the process of extracting often hidden patterns from previous data and may lead to new insights, applications, or alternative understandings of institutional processes.

According to Romero et al. (2008), data mining technologies have been making a lot of improvement in collecting and analysing large amounts of data generated from online learning systems. Online learning ensures that a record of all learning activities students interact with are kept, and when analysed they provide instant feedback to the educators. In addition, different data mining tools have been used to discover the exclusive types of data from online learning to ensure better understanding of how learning takes place, thus potentially improving the educational outcomes if data is used to inform action. This has been echoed by studies done by Wen and Rose (2014) and Yu and Jo (2014) that the effective use of data mining tools to envisage learners' performance centred on log data from different learning environments is quite necessary.

Accordingly, distance education should be aided by a data mining system for monitoring, supporting and offering direction to teaching and learning process (H¨am¨al¨ainen et al. 2016). Unlike the current tutoring systems where a teacher has only an occasional role, an organised data mining system highlights the role of a skilled instructor to infer the findings obtained from

analysing the data retrieved from the course. In addition, it summarises the results from research to show its feasibility and personalise distance education courses. Thus, it assists the educational technology research community to ensure a systematic learning process but this change would only be experienced if data is used to inform practice for improvement.

Mtembe and Kondoro (2019) established that data mining tools can be utilised to show patterns of how online learning is implemented in sub-Saharan Africa. They further established that most of the research published focuses on the learners' attitude and perceptions when interacting with online learning and therefore the need for more research on the exact trends of data mining in learning institutions offering distance learning.

In conclusion, distance learning is a longstanding mode of delivery of learning which is highly influenced by technology, and since technology is dynamic distance learning is dynamic too. The mode has potential to deliver education to all. The scholars in this area name it according to its role. Students' access to distance education is not yet satisfactory. It increasingly makes use of open educational resources which sub-Saharan African countries have not utilised effectively despite the effort to offer it to them. There is a need for policy in distance learning which is quite undeveloped in the region. The chapter also covers data mining in order to make data-informed decisions for development and growth of distance education in Africa: a research area in distance learning which has been confirmed to be under-explored during the time of writing this abstract. Searching the web for research on distance learning in Africa, results appear to be concentrated in South Africa and a few from Kenya and Nigeria. As researchers we therefore need to assess what is of value in distance education to ensure implementation and attainment of the sustainable development goals of the United Nations, and much more.

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