

Leveraging ICT to Widen Access to Higher Education in Kenya

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Abstract

We argue for ICT leverage to curb limiting barriers and aid widening access to higher education in Kenya. Impediments to higher education access in Kenya include affordability, flexibility, institutional limited capacities, lack of opportunities for education mobility and lifelong learning. A qualitative content analysis methodology appreciated Kenya's robust ICT infrastructure with great potential to tap into ICT based open and distance learning, learner centered E-learning and blended learning as some of the affordable and flexible strategies for widening access to higher education. In particular, ICT greatly enhances flexibility for working population because it fits in their work demands and personal commitments. ICT has huge potential to moderate access barrier to persons living with disabilities and rural dwellers. It is flexible to working class, lifelong learning enthusiasts and mobile learners. Ubiquity, reusability and portability of ICT based learning resources, contribute to affordability, hence contribute to widening access to higher education. Prioritising education using ICT's, with deliberate and targeted efforts by leaders and decision makers, is key to investing more resources in ICT and developing policies that prioritises widening access to education through ICT's.

Keywords: Leveraging ICT's; Widening Access; Higher Education; Kenya

1.0 Introduction

Enhancing higher education access, affordability and flexibility, are evolving concerns to institutions of higher learning the world over, as guided by the United Nations (UN) sustainable development goal (SDG) number four. The goal is to ensure inclusive and equitable quality education and promoting lifelong learning (UN General Assembly, 2015). Specifically, target 4.3, aims for equal access for all women and men, to affordable and quality technical, vocational and tertiary education, including university education by the year 2030. This endeavour is more pronounced in the wake of COVID-19 pandemic, that has disrupted learning delivery the world over and necessitated ways to survive rather than thrive in higher education provision. This imply that education is clearly a reforms concern that need to be accorded the significance it deserves, more so in the developing world such as Kenya, exhibiting weak educational infrastructures and skewed national development priority areas.

Globally, higher education institutions (HEI's) have been considered a focal point of knowledge and its application, contributing to society's advancement through fostering of innovation and training (Woldegiorgis, 2021). According to Bayusuf et.al., (2021), higher education in Africa has expanded significantly over the past several decades, although the majority of the population remains unable to access the limited number of higher institutions of learning, with a wide gap in access between and within countries. According to Teffera (2021), African higher education recorded a huge growth in the past decade despite the enrolment rate remaining among the lowest in the world (under 10% on average,

but 5% for most). Notwithstanding funding challenges in higher education, Kenya has made significant progress in higher education expansion as evidenced by the rise in number of HEI's over a 10-year period between the year 2002 and the year 2012 and substantial investments in ICT's in higher learning (KNBS, 2020).

According to UNESCO (2017), the UN-SDG's are attainable, if key partners, including governments; the private sector, civil society and stakeholders across the world, do their part. Leveraging ICT's in higher education in Kenya in one of the innovative strategies with the potential to widen access to higher education and enable learning without the limits of distance, geography, age, qualifications, finances and more recently, pandemics such as COVID-19. This is possible since most higher education activities, could be made available online and sometimes offered free of charge, hence expanding its reach to marginalised sectors of society with necessary support infrastructure.

The purpose of this study is to focus innovations for widening access in higher education in Kenya, towards ICT based solutions and interventions, and to make higher education access affordable and flexible to learners. This is particularly in response to rapidly expanding demands for higher education and existing access challenges.

1.2 Statement of the Problem

Educational systems the world over, ought to provide equal opportunities for all citizens and eliminate barriers to education access.

According to Shafique and Mahmood (2010), educational institutions play a key role in providing opportunities for people to learn information society knowledge and skills for the advancement of society in the digital age. Despite attempts to address equity by expanding the existing higher education systems to allow more access and promote equal distribution at the local, regional and national level, Kenya still suffers from barriers that limit access to higher education.

While many Kenyans continue to live in rural and remote areas with significant demand for education which remain unmet, access to higher education remains unaffordable and out of reach for many citizens. The challenge of ensuring equity of access to higher education is one that affects high, middle and low-income countries alike (McGowan, 2016). The brick and mortar settings of institutions of higher learning and the traditional way of knowledge delivery and transfer through physical lecturers, is not flexible to sections of society such as persons living with disabilities (PLWD's). The working class and people living in geographically distant and infrastructural alienated regions are also marginalised by traditional ways of knowledge delivery. Furthermore, the declining funding by the government limits the capacities of higher education institutions to expand in response to the rapid increase in population and increasing demand for higher education. There is need therefore to leverage the power of information and communication technologies (ICT's) in Kenya to widen access to university education for all.

2.0 Methods

The study adopted the qualitative research methodology, and was conducted using the

content analysis research design strategy. This includes reviewing relevant secondary text sources, documents, websites, and journals for appropriate content, relevant to the study. The document/content analysis checklist was used in data collection and content analysis technique, was used to analyse the data. Data presentation was done using qualitative textual description of analysis approach.

3.0 Results

3.1 Key Education Highlights from the Kenya Economic Survey 2020

The Kenya National Bureau of Statistics (KNBS) in its report dubbed Kenya economic survey 2020, for the period 2015 to 2019 informed that, the population of Kenya grew by more than fourfold within a period of 50 years to 47.6 million in 2019. From the report, it is evident that, many Kenyans (68.8%) continue to live in rural and remote areas and have significant demand for education, which remain unmet. The report further states that, 3.5 % of Kenyans had attained University level education by 2019. This implies that, the ratio of students in higher education for every 100,000 population is relatively low. Over the period under review, public chartered universities remained constant in number at 31 for three years, while the number of students placed by Kenya Universities and Colleges Central placement Service (KUCCPS) to public and private universities increased by 30.5% (68,550 in 2018/19 to 89488 in 2019/20). This implies more pressure on available resources and facilities in Kenyan universities (KNBS, 2020).

Furthermore, KNBS (2020) accounts that the development expenditure for the state department for University education declined by 9.1% to Ksh. 9.2 billion in

financial year 2019/2020. This undermines capacities of Universities in terms of facilities to adjust to the growing numbers of students and population. In addition, the implementation of government policy to ensure 100% transition from primary to secondary education is expected to further increase demand for university education and up the pressure on facilities later on. The report also indicated a decline in enrolment of adult education learners, which dropped by 1.6% from 212,441 in 2018 to 209,082 in 2019. This hampers lifelong learning efforts by the government and those interested in it for personal or professional development.

3.2 Impediments to Higher Education Access in Kenya

UNESCO (2017), regards education as a public good and a global common good. Additionally, education is regarded as a fundamental human right and a basis for guaranteeing the realisation of other rights. While the statement holds, many factors impede higher education access and sustainability in Kenya (a member of UNESCO) leading to gaps in education access. Affordability, flexibility, institutional physical locations, limited capacities of higher education institutions (HEI), lack of opportunities education mobility and lifelong learning, are among the major reasons impeding many from accessing higher education in Kenya. Further, as COVID-19 pandemic continue to rage havoc globally, the rural-urban divides, digital divides and education access gaps among the population of Kenya and the developing world, continue to widen (Trahar, et. al, 2020). According to Kandri (2020) close to 90% of all primary, secondary and tertiary learners in the world, were unable able to physically go to school due to COVID-19 pandemic.

Kenya being a low-to-middle economy and more than half the population living below the poverty line, the economic situation impedes many from prioritising University education. While public funding for higher education continues to decline, Universities are compelled to seek alternative funding to breach the funding gap. According to Biggs and Tang (2007), it is becoming a norm rather than an exception to fill the gap left by the decreasing public funding shortfall by charging higher students fees. Costs of higher education, therefore, remain out of reach for many potential learners in Kenya, hence limiting their access to higher education. Recent calls to increase university fees threefold in public universities in Kenya, is expected to further degenerate the situation, in the likely event that it is approved and implemented. UNESCO's science report dubbed *The Race Against Time for Smarter Development* (UNESCO, 2021), exposed its worry whether the current level of funding of tertiary education including HEI's in Africa will enable them focus on their core mandate of teaching, development and deployment of new state-of-the-art technologies. This calls for innovative ways leveraging ICT's to focus on its core mandate.

Education flexibility in terms of time, space and curriculum delivery is desirable in widening access to education to reach a larger section of the population. Traditional ways of knowledge delivery in Kenya through physical lectures in a "brick and mortar" setting is limited by time and space, making it inflexible to many, hence preventing many potential learners from accessing university education. Working class potential learners with the urge to expand their skills are limited in their quest to further their education due to the fixed learning times and geographic locations of institutions. PLWD's in Kenya are not fully catered for, in the design of

“brick and mortar” set up of many HEI in Kenya. Furthermore, many HEI’s do not provide enough support to PLWD’s in the learning process hence limiting their access to University education. Additionally, people learn through different ways and at varying speeds, but the traditional way of physical lecture delivery assumes a level “playground” where learners learn through the same way and at the same speeds. This limits learning and hence access to education to many learners perhaps with learning disabilities, such as learners with dyslexia medical condition characterised with sever learning difficulties.

Potential learners living in rural, remote and far-flung regions could be locked out of access to university education considering the costs, time and effort required to physically move to other regions seeking education. The decision to enroll in a university, may partly be influenced by the geographic location of the institutions, especially for the working class who may prefer an institution near their place of residence and work, to enable them balance their work, education and family responsibilities. Institutional resource constraints, coupled with declining development expenditure funding to HEI’s (KNBS, 2020), to a large extent hinders access to university education in Kenya. Lack of space and limited capacities, inadequate teaching facilities and staff in Universities, limits and indirectly controls the number of learners who can be admitted into educational programmes offered by HEI’s in Kenya. Lack of education mobility opportunities, arising from autonomy of universities in Kenya, leads to development of own curricular, even for related courses. This practice hampers education portability and mobility initiatives necessary for widening access to higher education. Learners should be able to conditionally move from one institution to another and

progress with their studies without much restraint. Joining advanced stages for the same programme in a different university should additionally be possible for learners, without which learning will be limited to a geographic location, time and space. This negatively affects and limits access to mobile students and workers in an increasingly global and mobile world.

Lifelong learning is a phenomenon that provides opportunities and promotes learning throughout the life of an individual. This is due to the believe that there is no end to learning, and that learning ought to happen as long as an individual possess capabilities to learn. HEI’s focus on academic work alone and churning out graduates, limits access to people interested in lifelong learning opportunities for self-growth and development, necessary for improving the quality of life among members of society. HEI’s are supposed to be agents of change in society, but lack programmes for adult learners and persons interested in lifelong learning and skills for personal and professional development and growth, and not certificates as envisioned by traditional universities. This lack of relevant lifelong learning opportunities hinders and limits access to education especially to adult learners.

4.0 Discussion: Opportunities and strategies to Widening Access to Higher Education

UNESCO (2020a), attributes the responsibility of education development in member states to respective ministries in charge of education, and are tasked with the responsibility of reviewing the purpose of their education systems in light of the ambitions of the UN-SDG’s. This places Kenyan higher education institutions at the

center of innovations to seize the opportunity and leverage ICT's to curb higher education access limiting barriers, and help widen its access in Kenya through flexible and affordable strategies, for the benefit of all. ICT's have improved and enhanced the quality of education and learning process in higher education the world over, despite operational challenges that exist. ICT based education ranging from accessing self-study courses on the internet; to complete electronic classrooms without the need for traditional infrastructure such as physical classrooms have been witnessed. These are witnessed in HEI's of the developed world, and continue to be increasingly and successfully leveraged in higher education institutions of the developing world such as Kenya with optimistic results.

4.1 Key ICT Highlights from Kenya Economic Survey 2020

The Kenya economic survey 2020 (KNBS, 2020), reports the proportion of conventional households using mains electricity in Kenya as the main source of power more than doubled from 22.7% in 2009 to 50.4% in 2019. This is affirmative and desirable for enabling and widening access to education through ICT's as it promotes and supports the uptake of electricity powered ICT equipment in the country. Additionally, Kenya through its rural electrification programme (REP) managed to transmit electricity to most parts of rural Kenya. This again enabled access to electricity in remote and rural areas, and thus promoted the uptake and use of electricity powered devices such as laptops, smartphones among others, suitable for digital learning.

According to KNBS (2020), the coverage of fourth generation (4G) network, improved drastically by 42%, following significant

deployment of trans-receivers, which increased from 7,469 in 2018 to 17,744 in 2019. This implies improved internet speeds and ability to carry multimedia content necessary for education delivery to homes and places of work. Fibre to the home (FTTH) subscription increased by 52%, while fibre to the business (FTTO) subscription grew by 43.3%. Furthermore, utilisation of the available bandwidth capacity improved significantly to 43.5% in 2019 compared to 25.0 % in 2018. Utilised undersea bandwidth more than doubled from 1.1 million Mbps in 2018 to 2.7 million Mbps in 2019.

The key ICT highlights has many implications for widening access to higher education in Kenya. More and more Kenyans are embracing the use of internet technology, as there is increasing demand for higher internet and communication speeds suitable for transmission and delivery of multimedia educational content to homes and places of work as evident in the increasing FTTH and FTTO network subscriptions. The power and contribution of ICT's in education can, therefore, no longer be ignored, as Weller (2011) aptly puts it that, technology is an autonomous system that affects all other areas of society including education. With its immense potential, ICT's could, therefore, be leveraged to widen access to education since both consumers and producers of education are embracing its use.

4.2 ICT Based Solutions to Widening Access to Higher Education in Kenya

“To shift to a sustainable future, we need to rethink what, where and how we learn to develop the knowledge, skills, values and attitudes that enable us all to make informed decisions and take individual and

collective action on local, national and global urgencies” (UNESCO, 2020a).

Whereas Universities in Africa have been working on virtual learning prior to COVID-19 in an effort to bring down costs and expand access to education, COVID-19 served to accelerate that need as HEI were forced to go digital (Bayusuf et. al., 2021). The pandemic, therefore, accelerated processes that were already underway, to transition more content to virtual learning platforms. According to Perrotta (2020), early responses from the educational institutions involved training faculty, and rushing to change their traditional curriculum to fit an online environment, mindful of technology, learning management systems, and various online learning platforms that learners could access.

Bhagat and Kim (2020), opines that although painful, COVID-19 presented itself as a rude awakening to everyone involved in the higher education including learners, instructors, policymakers, and society alike. Tapping into its robust ICT infrastructure and increasing investment, Kenyan institutions of higher learning embraced strategies that promote efforts to widen access to higher education through ICT's. For instance, with the help of regional partners such as African Higher Education Centers of Excellence for Development Impact (ACE Impact) and local partners such as Kenya education network trust (KENET), ICT based Open and distance learning, student centered E-learning, and blended learning strategies were implemented. In some cases, instructors made connections with students through text messaging platforms such as WhatsApp or telegram (Bayusuf et. al., 2021). This helped widen access to higher education in Kenya to sections of the population which would otherwise have been left out. UNICEF (2020), reports that

1.5 billion students in 190 countries were not able to attend school physically due to COVID 19 pandemic, and ICT's came in handy to save some.

4.2.1 Affordability: Reducing Costs of Education Delivery through ICT's

According to McPheea & Pickren (2017), advancements in ICT in the current information society has provoked the need for a paradigm shift, with many education providers embracing open and distance learning (ODL), as an innovative and cost-effective approach of delivering their pedagogical responsibilities Particularly during the COVID-19 pandemic. ICT based open and distance learning is, therefore, an affordable, effective and efficient way to widen access to higher education. Pannen (2007), argues for open and distance learning, as a feasible, inexpensive, and “easy” mode of education, with the potential to widen access to University education for many learners. Through affordable and flexible technological interventions such as use of compact disks (CD's), e-mails and internet for instance, lessons could be delivered to students in multimedia enriched formats to deliver learning materials to learners wherever they are without compromising the quality of instruction. According to Lembani et. al., (2019), distance education (DE) is capable of delivering quality university education to geographically marginalised and dispersed African students.

UNESCO (2020b) reports that COVID pandemic has forced higher education sector to undergo various forms of operational changes in addition to adjusting course delivery methods. Thus, conventional limitations of time and space are eliminated through open and distance learning, as

learners could be engaged affordably, without considerations of time, space and geographic distances. Churton (2006) recognises the ability of open and distance learning to provide adults with another opportunity for education, while reaching those disadvantaged individuals limited by time, distance, or disability, and updating the knowledge base of workers at their places of employment and places of residence.

4.2.2 Flexibility: Overcoming Limitations of Learning Resources, Time and Space

During the COVID-19 pandemic, HEI's made a dramatic transition from traditional face-to-face learning to passive and active remote learning in a very short time period (Kandri, 2020). Through ICT's, education lessons could be delivered through the internet, enriched with multimedia and hypermedia content such as video, animations, graphics and audio content to enrich and maintain the quality hence improve the learning process. Students could learn through the internet at their own pace, time and convenience hence breaking the barriers and limitations of fixed learning time, geographic and physical locations as well as reducing the costs of accessing higher education.

According to Sussanto et.al.,(2019), technology adds flexibility in the delivery of pedagogy and on how teachers present new knowledge and receive feedback from learners in an engaging and captivating experience. Opportunities to replay and revisit the lessons improve learning, particularly for persons with learning difficulties, who perhaps may unnoticeably lag behind in the learning process during the traditional learning delivery modes. This

strategy is equally useful in enhancing staff skills through e-pedagogy to improve the quality of learning delivery and hence the quality of education in HEI in Kenya.

4.2.3 Equity in Access: Addressing Limitations in Abilities

Using technology, persons living with disabilities are accorded an opportunity to receive support from HEI, with the deliberate effort to provide and use of assistive technologies to widen access to them. According to Reyes et.al., (2020), HEI's has been adopting measures based on virtual formulas that arise as options or complements to traditional face-to-face and more traditional practices through the use of ICT. This fact has enabled the inclusion of many people including PLWD's, previously excluded from higher education. Assistive technology toolbars could easily be implemented to provide functionalities such as screen readers to convert text into sound for people with serious visual impairment. Screen magnifiers and text enlargers could be implemented to help people with mild visual impairment, be able to read with improved comfort. Persons with learning difficulties apart from replaying recorded videos for emphasis to improve the learning process could benefit a lot from text readers able to convert text to speech.

4.2.4 Strategies for Implementation

Blended learning is a strategy, useful for HEI's implementation of ICT's, to widen access to higher education in Kenya. E-Learning courses supported by printed materials and occasional face-to-face meetings on campus, could help widen access in resource constrained environments. This is whereby, limited available resources

could be utilised and shared by alternating learners at different times, and supplemented with multimedia materials through the Internet to enrich student experience and knowledge of content. According to Sussanto et.al., (2019), e-learning allows accessibility essential in complementing with the traditional way of teaching. Well implemented blended learning strategies has the potential to double enrollments in HEI's, without much pressure on the available resources e.g. teaching staff and facilities, hence able to bring more learners onboard, hence widening access to higher education.

Where infrastructure exists, Kenyan institutions and governments both local and national working together, could tap into an ICT network to facilitate collaboration and establishment of online based institutions e.g., open online university. This is a purely online-based institution established by sharing, collaborating and pooling resources together with the support of the governments to cut on costs and optimise returns for national good. Education is delivered through learning management systems software used to deliver, track, and manage learning instructions on the internet. This strategy in addition to widening education access to many, is suitable to harmonise curricular and delivery between collaborating institutions for education mobility and widening access to people living in remote and rural areas affordably. According to Teffera (2021), many efforts have put in place in Africa to expand access to higher education through distance, online and virtual means, despite long-standing ambivalence attributed to quality, delivery and integrity.

To promote and support lifelong Learning initiative to reach persons interested in self and professional development, localised and

specialised open online courses (OOC's) borrowing from the model of massive open online courses (MOOC's) common among universities in the developed world, need to be initiated and promoted in society by universities to suit the needs of the local population. Open online courses promote lifelong learning among the members of society and encourages updating of life and professional skills. This is contrary to the traditional education models where for instance, without the requisite minimum qualifications, some learners would not be accepted into colleges of their choice and would not be hired for positions in which they would be otherwise qualified (Editors of the Salem Press, 2011).

There is need for open online courses to be self-paced and learner driven to save on resources and costs. This model of delivery has the potential to reach many adult and lifelong learning enthusiasts with requisite technology skills. According to Kaliisa and Picard (2017), the spatial distribution of ICT coupled with the need for lifelong learning opportunities has enabled ODL to move from the periphery to the mainstream of university education policy and practice. OOC's offered through ODL could be funded through public-private partnerships and offered to citizens free of charge and through the internet for flexibility and ease of access.

5.0 Summary and Conclusion

Kenya and the rest of the developing world, experience many challenges in their quest to widen access to quality, affordable and flexible higher education opportunities for all, in accordance with the UN SDG's. Despite their efforts to widen access to higher education, key impediments still impede its

efforts including the high costs of education occasioned by dwindling higher education funding and external support, inflexibility of delivery modes, time and places and lack of mobility and lifelong learning education opportunities. With its robust investment in ICT infrastructure, Kenya and the rest of the developing world, stands a very high chance to leverage the power of ICT to widen access to higher education to all, through ICT based Open and distance learning, student centered E-learning, blended learning as well as establishment of a school on the internet.

In conclusion, it is conceivable for Kenya and the rest of the developing world to tap into its great ICT infrastructure potential to innovate and widen access to higher education and to make higher education in Kenya more accessible, flexible and affordable. This beneficially accords equal education opportunities to all. With accessibility barrier flattened using ICT's, PLWD' and other marginalised sectors of society, such as people living in rural dwellings and others, will be brought on board to have equal education opportunities. Regarding flexibility and mobility prompted by ICT use in higher education, working class, and mobile members of society will have an opportunity to further their studies and update their skills. This helps in improving their productivity and contribution to the economy. The comparatively lower cost of production of technology-based education activities, their re-usability and portability helps bring down the cost of accessing higher education and make it much more affordable. It is imperative upon decision makers in Kenya and the rest of the developing world, including institutions of higher learning and the political leadership, to make deliberate and targeted efforts to

invest more resources in ICT, including in regions marginalized and lagging behind as far as infrastructure is concerned, and develop policies that prioritises education for all through ICT's. With proper efforts and investment in education through ICT's, more people will be accorded equal opportunities to access higher education hence widening access to higher education. These efforts also contribute to citizen's participation in educational programmes aimed at improving the living standards of the people in line with the United Nations sustainable development goals, which prioritises education as a factor of human and national development. Since the study was based on a qualitative approach, authors recommend further empirical study on the subject, to uncover more impediments to higher education in Kenya and to be able to generate actionable statistics that can specifically inform decision making on leveraging ICT's to widen access to higher education In Kenya.

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