“Information Communications Technology in Higher Education in Africa: Challenges from the COVID-19 Pandemic”

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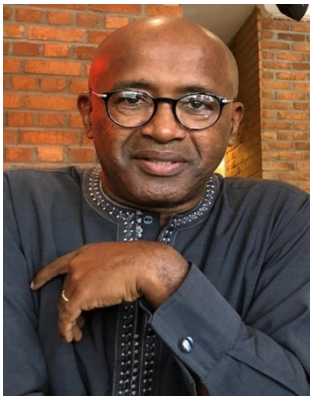

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Acknowledgements

This paper builds on the Pre-recorded Policy Conversation on Information and Communications Technology (ICT) in Higher Education[1] in Africa: Challenges from the COVID-19 Pandemic, co-moderated by Mr. David Wright, Economic Affairs Officer, Office of the Special Adviser on Africa (OSAA); and Mr. Ali-Mohamed Sinane, Lead Planning and Regional Coordinator for SDG4 and Education Planning, West African Cluster, UNESCO, Dakar, Senegal, with the following discussants: Dr. Elizabeth Ngutuku, Researcher at the Firoz Lalji Institute for Africa, (FLIA), London School of Economics and Political Science; Dr. Anne Siebert, Researcher and Lecturer, Institute of Development Research and Development Policy (IEE), Ruhr-University Bochum, Germany, and at the South African-German Centre for Development Research, University of the Western Cape, South Africa; Dr. Emeka E. Obioha, Full Professor of Sociology and Chair of Research and Higher Degrees, Faculty of Humanities, Social Sciences and Law, Walter Sisulu University, South Africa; & Dr. Melisew Dejene Lemma, Assistant Professor of Policy & Development Studies, and Journalism & Communication, Institute of Policy & Development Research (IPDR), and Department of Journalism & Communication, Hawassa University, Ethiopia.

The ideas in this paper have been informed by ongoing research and experience by the experts in their individual capacities, and in contribution to the OSAA Knowledge Network, which was launched on June 29, 2021.

michaeljung

1 Education beyond high school, especially at a college or university.

Executive summary

Before the COVID-19 pandemic, many regions around the world were already confronted with diverse challenges in fulfilling the right to education. This is mirrored for instance in the high drop out of school rates and high illiteracy rates the world over. Within this context, implementing Sustainable Development Goal 4, which strives to ensure quality education for all, has remained a daunting task. Strikingly, sub-Saharan Africa presents the highest numbers in terms of education exclusion. For instance, more than a fifth of children aged between 6 - 11 years are not in school as well as one-third of youths aged between 12 – 14 years according to the UNESCO Institute for Statistics (UIS). Education exclusion is also gendered with girls being more likely not to attend, and to drop out of school. Urgent action is therefore needed to engage with these issues in the face of an ever-growing young population in Africa.

At the same time, it is evident that policy debates and data on education quality and access tend to focus mainly on children and young pupils in primary and secondary education. Higher education often receives less attention despite its important role in the continent's future. Responding to this lacuna, the African Union's Continental Education Strategy for Africa 2016-2025[2] highlights that strengthening the linkages between tertiary education[3] and the world of work needs attention. This implies a need to revitalize and expand higher education and particularly to contribute to well-equipped societies and workforce, to address continental challenges and to promote global competitiveness.

2 Continental Education Strategy for Africa 2016-2025 (CESA 16-25) | Strategies (edu-au.org)

3 Tertiary education refers to all formal post-secondary education, including public and private universities, colleges, technical training institutes, and vocational schools. Tertiary education is instrumental in fostering growth, reducing poverty, and boosting shared prosperity.

Introduction and overview of higher education in Africa

In Africa, the numbers of higher education institutions (HEIs) and graduates remain the lowest compared to other regions. According to the UIS, enrolment numbers are available for 65% of the countries in the continent (UIS 2021). Northern Africa has the highest proportion, along with Southern Africa (UNESCO, 2021a). Overall, data availability on education, particularly on tertiary education, is limited and covers a restricted number of countries.

While the continent has seen explosive growth in the number of higher education institutions over the last forty years, there remains a need to engage with issues of accessibility, quality, financial resources, infrastructure, and human capital, speaking for instance about well-trained lecturers. Additionally, the unprecedented expansion of tertiary education has been accompanied by persistent vertical and horizontal inequity (ITU database, 2021). The vertical dimension refers to those who enter and those who graduate. Even when they gain access, students from disadvantaged groups tend to have lower completion rates. In addition, the horizontal dimension is concerned with the kind of institutions attended and the labor market opportunities that qualifications offer graduates. Accessibility and completion, as well as the quality of higher education, are further complicated by poor technical conditions, including restricted access to information and communication technologies (ICTs). There is therefore a need to continually upgrade infrastructure to meet the changing demands of 21st-century higher education.

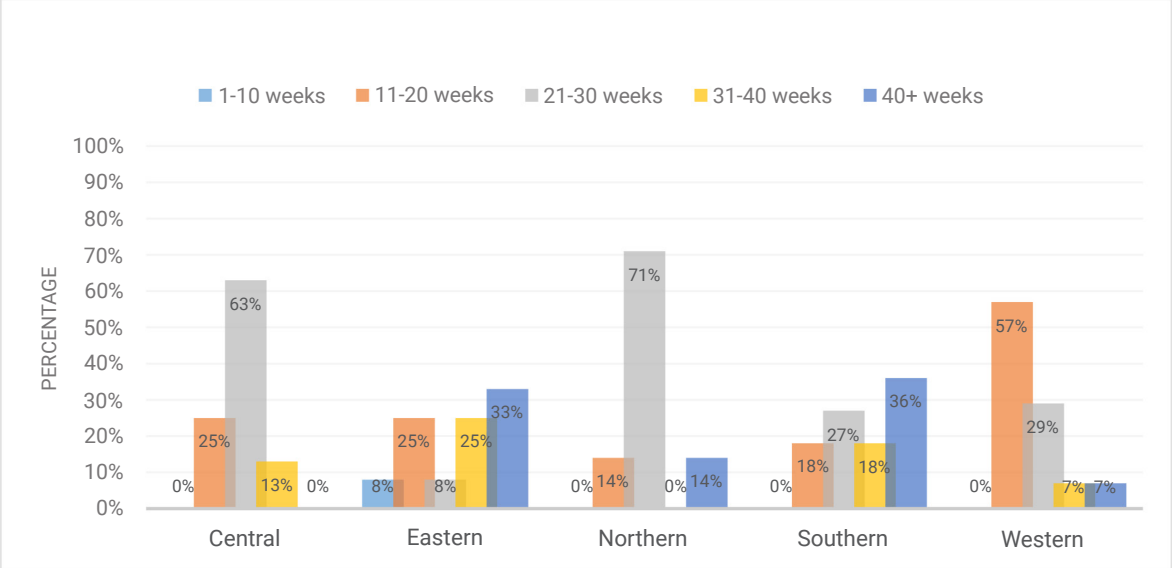
Within these challenges, the Covid-19 pandemic has further exposed higher education's systemic deficiencies comprising also the difficulties in integrating ICTs in learning and management. Africa needs to be ready to design appropriate policy, invest in infrastructure, train personnel, and develop skills and capacities to avert, minimize, and address the impacts of the pandemic. This paper sheds light on the challenges encountered in the use of ICT in HEIs during the pandemic by exploring the quality, integrity, outcomes, as well as equity issues occasioned by this deployment. We argue that despite these challenges, the pandemic provided important lessons, and call for further action in this field, moving forward.

Riccardo Niels Mayer

1. ICT in Africa and the pandemic: an overview

The Covid-19 pandemic has affected the delivery of training and learning, and this was coupled with unprecedented closure of institutions of learning the world over, but with a disproportionate representation in Africa. For example, according to UNECSO (2020:1), while school and other education institution closures affected 94 per cent of the world's student population, this proportion is higher in low- and lower-middle-income countries, including Africa, where it stands at 99%. A World Bank estimate revealed that African tertiary level education is one of the most severely affected sectors due to Covid-19 (World Bank, 2020). Marinoni, et al. (2020) also revealed that in the continent during the lockdown, most campus activities stopped, compared to other regions of the world where ICT use had previously gained traction. Figure 1 below shows the extent of closures on institutions of learning in Africa in 2020-2021.

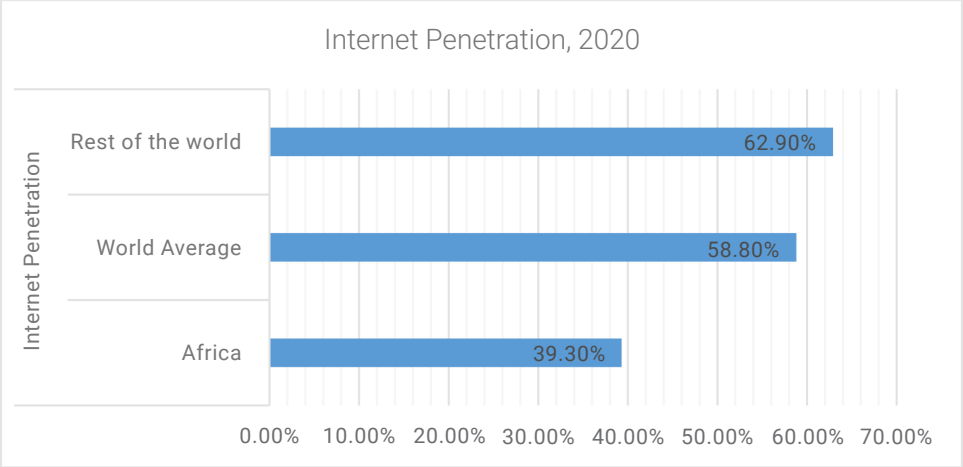
Figure 1: Duration of school closures in Africa, 2020-2021



Source: UNESCO 2021(a)

These closures, coupled with restricted face to face learning, meant that ICT was the only option for ensuring continuous learning, or doing what was seen as saving the academic year in 2020 and 2021. However, the pivot to online learning as well as deployment of ICT revealed that Africa lags behind other world regions in terms of ICT access and utilization. Thus, the digital divide is mapped into existing vulnerabilities in most African countries with stark regional differences. For example, in terms of internet penetration, data from World Internet Statistics reveal that Africa lags behind with only 39.3% penetration compared to 62.9% in the rest of the world (see figure 2 below). This is confirmed by Faraj (2020), who revealed that in Africa internet penetration is still under 40%, and much lower than the global average.

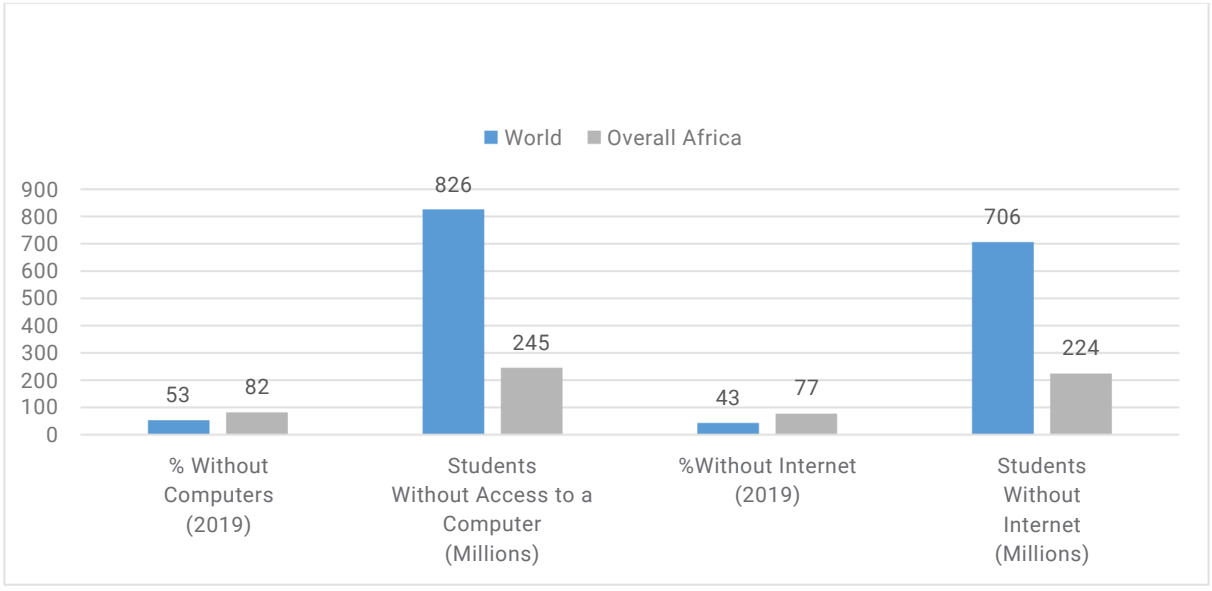
Figure 2: Internet Penetration in 2020



Source: Internet World Statistics

Such limited penetration, coupled with lack of access to learning devices, has implications for learning. For example, data revealed that 245 million learners across different levels did not have access to a computer in Africa. Additionally, 224 million learners did not have access to the internet in Africa. See Figure 3 (UNESCO, 2021a).

Figure 3: Percentage of households lacking computer devices and internet to support teaching and learning during the Covid-19 crisis, 2020



Source: UNESCO 2021(a)

The move to online learning also revealed ICT and governance issues that were already extant in the context of higher learning in Africa. For example, there is inadequate funding for ICT, with most universities relying on external donors, who were also hard hit by the pandemic. Additionally, most of the universities did not have ICT policies including policies for blended learning as well as standards and accreditation. While there were a few existing regional and ICT interventions in Africa (see the activities of the IUCEA here and those of the Association of African Universities (AAU) here), many such interventions do not engage the higher education commissions (Young et al. 2021). Indeed, Mkandawire et al. (2021) noted, the pandemic has helped us to start asking different questions, like who sets the agenda for such partnerships? Additionally, there were only a few universities that were online, using spaces like Moodle for managing assessment and sharing learning materials, but not for teaching.

On a more positive note, the Covid-19 era is being heralded as a watershed moment in the ICT infused learning in the HEIs (Marinoni & van't Land 2020). This is because HEIs were forced to either adapt quickly or to stall and risk being left behind. As Faraj (2020) noted, it "has forced universities to recognize that the future is now". Further spaces are being opened up by the flexibility of asynchronous learning with arguments that it may provide the much-needed access to education to those from marginalized communities, and address issues of high fees that make higher education unattainable for many in Africa. Furthermore, blended learning might improve the quality of face-to-face teaching.

Importantly, this moment brought the power of knowledge sharing to the fore (United Nations (2020:1)), and opened more spaces for penetration of knowledge sharing through local, regional, and national broadcasting services (Marinoni and van't Land (2020:9), but also through other platforms that are borderless. Going forward, such spaces are bound to change the way we do and think about university education generally and learning in HEIs in Africa in particular.

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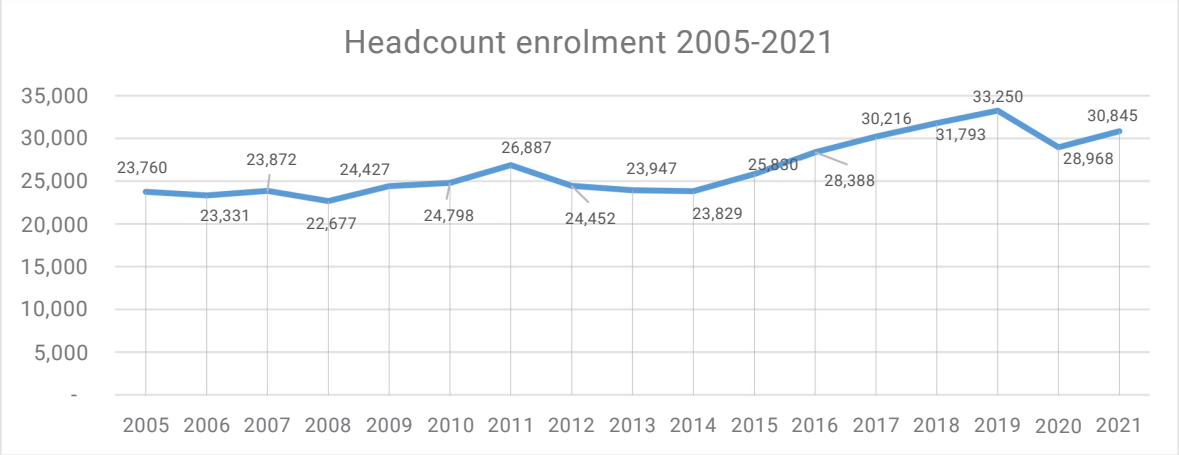
2. *Challenges for quality: integrity of learning outcomes in African HEIs*

Despite such spaces that have opened within the context of the deployment of ICT, challenges still linger. The pivot to online learning and the use of digital pedagogical practices[4] did not assure achievement of the anticipated learning outcomes in the HEIs. These outcomes include enrolment target, pass rate, throughput rate, quality of learning and integrity of assessment. Even with the adoption of ICT, several HEIs, especially those that are resource disadvantaged, suffered unanticipated setbacks in student enrolment numbers, both for continuing and fresh entrants. (See Figure 4: the example of enrolment for South Africa). This was despite innovative strategies, massive ICT deployment, and laptops and internet data devices being distributed by universities to students in their remote villages (Sobuwa, 2020) to aid in access to ICT for registration and learning purpose. The ICT, therefore, assisted only minimally since, due to the disruptions caused by the pandemic in the enrolment and registration processes, they were either completely stalled in some instances or encountered various glitches in other contexts. Research has also revealed that in most cases the pass and throughput rate in the HEIs in Africa has been either stagnant or on the decline despite the ICT intervention in the learning environment.

Figure 4: WSU headcount enrolment 2005-2021(South Africa)



Source: University performance within the south block grant: DHET (South Africa), March 2021
Cited in Parekh, A. & Gibbon, T. (2021).

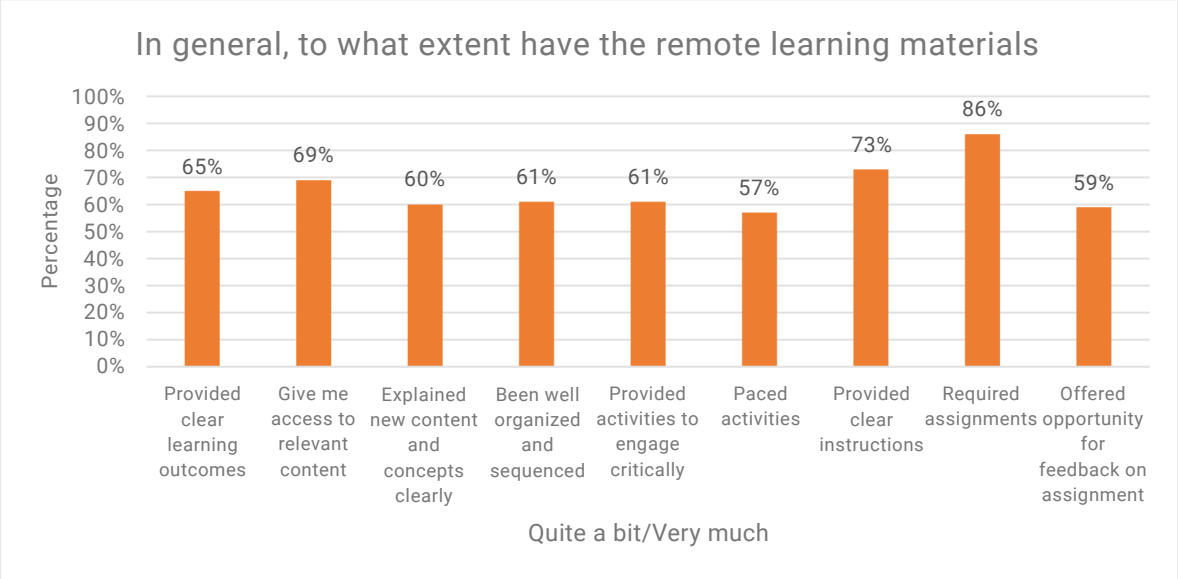
While data on outcomes of learning is limited, there are indications that the deployment of ICT in the HIEs and the sudden shift from traditional face-to-face learning to the virtual classroom compromised the anticipated learning success and the quality of delivery. Students' experience revealed that online teaching during the pandemic did not meet the expected target in terms of quality of grasp (South Africa Department of Higher Education and Training, 2020). Students also did not feel like they achieved much. While this can be

4 Pedagogy is often described as the act of teaching. The pedagogy adopted by teachers shapes their actions, judgments, and other teaching strategies by taking into consideration theories of learning, understandings of students and their needs, and the backgrounds and interests of individual students.

attributed to a general lack of digital literacy in much of the continent, research done in Egypt by El Said (2021) reveals more about the effect of pedagogical practices. This is because students who had higher GPA scores fared well in exams compared to those with lower GPAs. This was attributed to reduced or no mentoring by lecturers, tutors or senior peers than would have been the case in face-to-face interactions. When students' satisfaction was used as a proxy for quality of learning, such students also perceived that the online learning did not benefit them.

The ICT usage mainly translated to a loss of learning quality, as interactive classroom debates and the psychological feeling that comes with live physical classes are lost entirely due to the challenges associated with e-learning (South Africa Department of Education and Training, 2020: 36-48). In terms of procedural sequence, teaching and assessment, as two parts of the same coin, were affected as the teaching content and processes of teaching were minimized compared to assessments (see Figure 5) This resulted in poor quality learning (E-Learning Africa & EdTech Hub, 2020).

Figure 5: Quality of remote teaching and learning in South Africa



Source: South Africa Department of Education and Training (2020)

On assessment content and what was being assessed, some ICT specialists in the continent concurred that COVID-19 has highlighted how much the assessment in the educational system is geared to rote learning[5], that emphasizes memorization and certification instead of skill and mastery. Quality-wise, assessment processes in the ICT infused learning system in HEIs, in general, lacked a universal definitive standard for ICT based assessments. This meant that individual faculties, departments and sometimes the lecturers were left to determine the assessment modalities to be used.

More worrisome were the integrity issues in the HEI's assessment systems and processes occasioned by the deployment of online

5 Rote learning is a memorization technique based on repetition. The idea is that one will be able to quickly recall the meaning of the material the more one repeats it. Some of the alternatives to rote learning include meaningful learning, associative learning, and active learning.

assessment in the learning management systems. For example, academic dishonesty by students was widely reported in many HEIs in South Africa, with copying and disregarding intellectual property also becoming widespread (Macupe, 2021; Verhoef and Coetser 2021). While some HEIs in some more economically and technologically advanced countries in the continent developed a number of strategies in dealing with this situation, most institutions in Africa do not have the means to do the same. In South Africa for instance, the National Benchmark Test (NBT) domiciled in the University of Cape Town implemented

Confidence

the use of 'lockdown browser software' as an invigilation and monitoring tool for the remote online examination sessions 2021.

3. Challenges with access and equity

While the whole education system was affected during the pandemic, online learning revealed intersectional differences in equity and access. Such differences were between learners, institutions, across countries and regions, universities, urban and rural locations as well as gender and class differences (Zeleza and Okanda 2021; Agyapong et al 2020).

These challenges of the digital divide mapped into an existing terrain of an apparent lack of clear policy direction on the use of ICT in higher education in Africa, and a general lack of preparedness. For example, the move to online learning revealed differences between countries. While most universities in countries such as in Egypt, Ghana, Nigeria, South Africa, and Rwanda were able to move completely online, this was not possible for many other countries in Africa due to various

infrastructural and capacity challenges. Some universities also reported being caught 'flat footed'. This was in the sense that while some universities had pre-existing IT infrastructure and facilities, other less endowed universities or those serving students from predominantly low social economic backgrounds could not afford it. Some private universities, including those in Kenya and Nigeria embraced online learning more compared to the public ones.

In terms of the impact, the move to remote learning as of April 2020, due to the closure of HEIs in about 175 countries worldwide (World Bank, 2020), had more of an impact on African HEIs than anywhere else since those institutions have limitations in terms of ICT infrastructure (see also Marinoni, van't Land & Jensen, 2020). These include, but are not limited to, access to devices such as computers and mobile phones, as well as internet access. For example, while the proportion of active mobile-broadband subscriptions has increased for developing countries, where the figure rose from 35.4% in 2015 to 73.9% in 2021, this is less than the world average, which increased from 44.6% in 2015 to 83.2% in 2021 (ITU database).

Inadequate access to learning devices also revealed disparities in access across countries in Africa. For example, access to technology in some countries like Burundi, Central African Republic (CAR) and Eritrea is below 5%, while in CAR mobile phone access is just 36 per cent. Research also reveals that access to ICT in educational settings and distance learning is lower in francophone countries in Africa (Asim, and Gera 2020).

On a broader scale, our review not only shows a need to go beyond access to ICT, but also to examine the adequacy and quality of the devices since some of these could not be used for typing up assignments. Most countries in Africa are also faced with issues of electricity connectivity and this affects learning especially because many learners in Africa live in rural areas with little access to electricity and in some countries power limitations due to load shedding were a common practice.

In most of Africa, the affordability of data was a major barrier to online learning. While some countries like Kenya and South Africa, Ghana, Nigeria, Sierra Leone, Ethiopia, worked with tele-companies to zero-rate[6] educational platforms, literature also revealed that some students did not benefit from asynchronous forms of learning since the video recording options were not zero-rated. Other zero-rated sites reportedly directed learners to other platforms like MOOCs that are not zero-rated. Lack of sufficient internet bandwidth in most African countries also accentuated problems with learning.

Since digital literacies are not cultivated from an early age in Africa, lack of digital fluency/ literacy also exacerbated inequities in access by the learners with arguments that these learning strategies did not cater for the 'messy realities of students' engagements with digital technology' (see Ndzinisa and Dlamini (2022). It was not just lack of digital literacy but also lack of knowledge in digital pedagogies that affected the lecturers, and some of them were reportedly just posting their notes online with little regard for pedagogical aspects. Some were posting old notes they had used before the pandemic. To correct for this, in some countries non-teaching staff who are conversant with IT in some cases assumed the responsibility of communicating with the students and some universities retooled their IT staff to enable them to provide training and pedagogical support to the teachers and students (Mtebe at al. 2020).

6 Zero-rating is the practice of providing Internet access without financial cost under certain conditions, such as by only permitting access to certain websites or by subsidizing the service with advertising. Commentators discussing zero rating often present it as a subtopic of net neutrality.

In terms of disability sensitivity and appropriateness, while the well-endowed universities had structures for meeting the needs of students with disabilities, including having separate platforms, other universities had a one-size—fits-all online curriculum and examination method. Some learners with disabilities reported that the time allocated for submission of exams was not adequate, and this was coupled with inadequate hardware and software, including formats such as braille, and platforms that were not compatible with assistive technologies (Ngubane and Zongozzi 2021). Most lecturers also lacked skills for working online with students with disabilities. For classroom interactions, it is important to note that some disabilities may be more accentuated during online learning, and access without support can also lead to inequalities that affect the quality of learning. Limited face-to-face and social interaction with instructors and classmates make students with special needs and those from marginalized contexts lag further behind (Zongozzi, 2020; UNESCO 2021 b).

It is important to note that the move to online learning pointed to the need for flexibility in learning and assessment, thereby making it possible for some learners who are vulnerable to participate adequately. Some teachers and managers reported that they became more concerned and aware of the well-being of the learners and especially those from poor social-economic backgrounds. That senior managers were more involved in students learning and the student-centered approach in some contexts was valorized, as noted in one of the research projects in South Africa-

"The lockdown has forced us to look much closer to where our students are, where they are positioned, what resources they have, what opportunities to engage in teaching and learning. And we cannot unsee these differences, whether on or off-campuses (Czerniewicz, et al. 2020:950)".

In terms of gendered intersectional differences, the lack of favorable spaces for study at home, coupled with the gender burden of housework for girls made it difficult to set aside time for studies and thereby exacerbated the existing intersectional gender inequalities. While this aspect did not affect those students who were living in university residencies, this can be particularly a problem where digital learning takes place when the learners are at home.

Confidence

4. *Policy recommendations*

- For IT literacy/fluency to be able to make the most of blended and online learning, there needs to be more emphasis on digital literacy in secondary schools to equip future students and teachers with the skills they need and familiarize students with online learning.
- Policymakers need to create an enabling policy environment and to work with firms to provide effective and affordable internet services and subsidies to universities to enable ICT access.
- There is need for teacher training and reskilling and retooling of teachers, as well as IT professionals. Beyond ICT skills, ICT pedagogies should be part of teacher training.
- Increased collaboration between universities in the region is required as the continent adapts to the new normal.
- Some policies like content sharing need to be reviewed, as do policies on teacher training. For example, in some universities, the policy prohibits sharing of online course content, and this is against the current dispensation of open ICT policy.
- Sustained, rather than *ad-hoc* and reactive ICT capacity building for educators and learning in the HEI is critical and necessary.
- It is important to redesign the HEI learning management systems (LMSs) to be responsive to change and future disruptions like Covid-19.
- Given that the electronic LMS, including assessment, has become the new normal, there is need for more investment in electronic invigilation and monitoring tools to ensure the integrity of the assessment process.
- Based on our findings, little research has been done on the effectiveness, access, and equity around issues of ICT. Most of the research was only carried out in Southern African countries. There is therefore a need for commissioning studies to gauge the impacts of ICT in learning across the whole continent. Such research will better lead to evidence-based policymaking around the use of ICT in higher education in Africa.

Vadim Pastuh

5. Conclusion

The deployment of ICT in HEIs in Africa has revealed that African countries faced myriad challenges in adapting to the changes occasioned by the pandemic. These ranged from exposing the inadequacies in the infrastructure system, exposing the unpreparedness of HEIs in terms of institutional, student and educator capacity to adapt to the evolving learning modalities. Additionally, there were not only disruptions, but also compromises in terms of quality and integrity compared to the situation in other continents, especially, Europe and North America. The use of ICT in higher education on the continent also revealed various access and equity issues for differently located learners, including those with disabilities, gendered education particularly for girls who are largely excluded, and those from marginalized socio-economic backgrounds. If these issues are not addressed at the higher education level, the gains in terms of enrolment, quality of delivery and integrity, as well as the inclusion of learners of diverse identities, risks being eroded.

The paper and pre-recorded conversation also revealed that various spaces have been created that show a need to go beyond the challenges and embrace the learning and spaces opened up by the deployment of ICT in HEIs. These include enabling spaces for equity in learning and access. Indeed, ICT in higher education in Africa is no more a luxury. However, it is needed there, not only to catch up with the world in providing access to higher education for its citizens, but also in addressing and responding to the effects of the pandemic. This requires African leaders' commitment in devising a sound policy, investment in ICT infrastructure and ICT literacy. Within the context of the Covid-19 pandemic and moving forward, there is also a need for continuous reflection on what Africa needs to do differently to attain the SDG's vision of 'ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all'.

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