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Digital technologies and remote teaching during COVID-19 pandemic in African higher education institutions

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Abstract

Digital transformation of higher educational institutions (HEIs) in Africa has been a discussion issue in many fora across several African countries, yet with little investment commitment from the government. Interestingly, the outbreak of COVID-19 with the attendant lockdown paved the way to transition to online teaching and learning. Using the dynamic capability theory, this chapter aims to explore the role of digitalisation on pedagogy among African HEIs during the COVID-19 lockdown. Semi-structured interviews comprised data collected from 15 academics from three African countries (Ghana, Kenya, and Nigeria). The study found that the implementation of digital technologies in remote teaching differed across African HEIs during the COVID-19 lockdown. This study offers theoretical and practical recommendations to accelerate the digitalisation of HEIs in Africa.

Keywords

Dynamic capability, digitisation, pedagogy, higher education, Africa.

Introduction

Digital technologies have become part of our everyday lives. Its use cuts across age, race, sex, and social status. Underlining the ubiquity of these tools, a recent report indicates that as of January 2021, 4.66 billion people actively use the internet, that is, 59.5% of the global population ([Statista, 2021](#)). However, the educational sector has enjoyed unprecedented use of digital technologies in recent times ([Khalid et al., 2018](#)). Thus, the digitalisation of education implies the deployment of digital technologies to improve pedagogy and administrative system and offer flexible educational programmes to aspiring candidates ([Tømte et al., 2019](#)). For pedagogy, digitalisation through mobile learning has made learning accessible, easier, and more comfortable ([Sattarov & Khaitova, 2020](#)). [Guerrero et al. \(2021\)](#) explored digitalisation in the context of massive open online courses (MOOCs) and found that MOOCs linked with the intrapreneurial capabilities of the universities are related to the achievement of the universities' outcomes.

Research also notes that whereas there has been a hesitancy in adopting digitalisation by the majority of HEIs in Africa, COVID-19 restrictions compelled its adoption ([Khoza & Mpungose, 2020](#)), as most of them resorted to quick fixes. For instance, some governments and HEIs were dynamic by introducing emergency interventionist programmes such as online libraries, online learning platforms (e.g., Microsoft Teams and Zoom), TV broadcasts, and video lectures. On the other hand, research highlights that a significant number of HEIs in developing countries had their academic calendar suspended throughout the COVID-19 restrictions ([Marinoni et al., 2020](#)), with far-reaching social and psychological effects on the teachers and the students.

Currently, restrictions are being lifted in some countries with academic life gradually returning to normal. However, some HEIs have already lost a significant amount of time due to the restrictions. On the other hand, the deployment of digital technologies played a key role among HEIs that seamlessly transitioned to virtual learning modes. The report of the International Association of Universities (IAU) which surveyed the global impact of COVID-19 on universities and other HEIs highlighted that Africa was the only region where teaching was suspended or cancelled at the majority of HEIs ([Marinoni et al., 2020](#)). The report added that lack of access to requisite digital

technologies was the reason COVID-19 affected teaching and learning in the majority of HEIs in Africa. Drawing from the dynamic capability theory, this study appraises the extent to which digital technologies cushioned the effect of the COVID-19 restrictions on pedagogy among HEIs in Africa. Dynamic capability addresses the firm's proactiveness in recognising and adapting to internal and external environmental changes (Teece et al., 1997).

In the light of the foregoing, the purpose of this study is to; a) explore how digital technologies enhance pedagogy among African HEIs; b) investigate the effects of COVID-19 restrictions on pedagogy in African HEI; and c) investigate the role of digital technologies in the transition to remote teaching by African HEIs during the COVID-19 restrictions. This study's key contribution is that it extends the dynamic capability theory in exploring the use of digital technologies among African HEIs. Progress recorded through digital technologies poses critical challenges to HEIs to transform into the ever-changing digital landscape and integrate them into their core mission of teaching, research, and commercialisation (Guerrero et al., 2021). The rest of the study is structured as follows; the next part (Part 2) provides a theoretical background for the study. Part 3 details the research method, while Parts 4 and 5 provide the data analyses/results and discussion, respectively.

Dynamic capability theory and the digitalisation of HEIs

The dynamic capability theory is an extension of the resource-based view. The dynamic capability theory stresses the timely and responsive adaptation of internal and external competencies of the firm congruent with the changing business environment (Teece et al., 1997). Literature acknowledges two polar definitions of dynamic capability: process and routine (Zollo & Winter, 2002; Barreto, 2010). From the routine perspective, scholars define dynamic capability as "a pattern of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness" (Zollo & Winter, 2002, p. 340). The process perspective views it as the firms' ability to systematically solve problems, formed by its propensity to sense opportunities and threats, to make timely and market-oriented decisions, and to change its resource base (Barreto, 2010).

In strategic management, Hung et al. (2010) measured organisational dynamic capability with three dimensions: organisational strategic capability; research and development innovative capability, and organisational management capability. Organisational strategic capability implies a firm's proactivity in anticipating future opportunities and challenges and responding in a way to achieve organisational goals. In the research and development of innovative capability, the firm identifies individual employees' strengths and weaknesses; and harnesses their strengths for the common good of the firm and the individual. The organisational management capability dimensions measures elements such as the firm's capability in understanding customer needs and preferences, effective internal communication among departments, and interest in the wellbeing of staff.

In a literature review, Barreto (2010) deconstructed dynamic capability into four dimensions: the propensity to sense opportunities and threats, to make timely decisions, to make market-oriented decisions, and to change the firm's resource base. The propensity to sense opportunities and threats implies that the firms should incorporate mechanisms that continuously monitor environmental changes, to respond promptly. The propensity to make timely decisions refers to the ability to quickly reconfigure and transform ahead of competitors. He explains that the propensity to change resource base includes the firm's propensity to create, extend, and reconfigure resource base. Finally, the propensity to make market-oriented decisions is argued to represent the propensity of firms to make and implement decisions that provide superior value for their customers. Building on Barreto's (2010) dimensions, Li and Liu (2014) proposed strategic sense-making capacity, timely decision-making, and change implementation capacity. Like the propensity to sense opportunities and threats, strategic sense-making implies the propensity of the firm to develop cognitive maps and

continuously sense stimuli while analysing information suitable for the firm’s competitiveness. Timely decision-making relates to the firm’s ability to quickly formulate strategic decisions and respond promptly. Change implementation involves the ability of the firm to execute strategic decisions which involves corporate change with many layers of managerial processes. Put together, firms operate in different changing environmental situations, thus, they must be proactive in harnessing their internal resources and develop the capability to sense external environmental opportunities and threats.

Dynamic capability theory has been applied in extant HEIs research in the context of social responsibility (Hayter & Cahoy, 2018), MOOCs (Guerrero et al., 2021), and market orientation (Ma & Todorovic, 2011). This study integrates Barreto’s (2010) and Li & Liu’s (2014) dimensions to investigate how HEIs in Africa respond to the ever-changing digital landscape and integrate them into their core mission within the COVID-19 lockdown. Following Li & Liu’s (2014) strategic sense-making capacity, HEIs are faced with several opportunities and threats occasioned by digital transformations. Knowing that talented faculty and students are always attracted by HEIs with efficient, cutting-edge, and state-of-the-art digital ecosystems that support teaching and learning, there should be a clear digital roadmap developed through internal and external sensing with all relevant stakeholders. Internal sensing could be through regular staff meetings, informal chats, and training programmes (Hayter & Cahoy, 2018). External sensing could happen through systematic efforts that expose the staff of the institution to the digital transformations and the specific tools used by other HEIs. This could be achieved through sponsorship of staff to external conferences, exchange programmes, and research visits with formal reports expected after such visits. These reports constitute a significant pool of ideas to be implemented. Additionally, strategic sensing positions the institution to be environmentally dynamic such that the firm adapts quickly to mitigate severe occurrences.

Research methodology

This study adopted a qualitative research methodology with personal interviews. Research highlights that interview provide rich and comprehensive insights into the feelings, emotions, and nuances surrounding the focal phenomena (Kauppinen-Räsänen et al., 2019). Yet, studies are still scant that have explored the effect of COVID-19 on pedagogy within the African context. Additionally, based on the IAU report which highlights that most HEIs closures happened in Africa, a study of this nature is not only timely but also evince critical insights that could help to reposition the technological landscape of HEIs in Africa. Semi-structured interviews with questions developed using Li and Liu’s (2014) framework of dynamic capability (see Table 2.1) were used.

Table 2.1 Theme and summary of questions

<i>Theme</i>	<i>Summary questions</i>
Strategic sense-making capacity	<ul style="list-style-type: none"> • Do you use digital technologies to implement teaching and learning? • Please what are these digital tools and in what practical ways did you use them? • Do you think your university has an IT roadmap for the implementation of teaching and learning? Please explain. • If yes, was their consultation among the members of the academic community to arrive at this road map. • Are there organised training and workshops to

	<p>update staff with the requisite skills required to effectively use digital technologies in the classroom?</p> <ul style="list-style-type: none"> • What are the attitudes of the lecturers and students in terms of the use of digital tools for teaching and learning? • Could explain the effectiveness of these digital tools in the achievement of the university objective?
Timely decision-making capacity	<ul style="list-style-type: none"> • How did your university implement teaching and learning during the COVID-19 lockdown? Was the university completely shut down or you transitioned to remote learning using digital tools? • In case you implemented remote teaching, was your transition phased or instantaneous? • How long did it take your university to start implementing remote teaching? Were there some weeks or months gap? • Could you explain how relevant arms of your university maintained quality assurance in remote teaching during the pandemic?
Change implementation capacity	<ul style="list-style-type: none"> • Are there situations where implementation of digital technologies is impossible? Please explain the specific situations. • Did you acquire new skills by using digital technologies during the lockdown? Please name these skills. • In what ways do you think the new skills can help you in your future teachings? • When you were told that you would implement remote teaching, did you entertain any fears? How do you compare those fears to your present skills and experiences? • Did the use of digital technologies in remote teaching affect students' performance? Please explain how students were positively or negatively affected.

Source: Authors

As the study focuses on the role of digital technologies in enhancing pedagogy among African HEIs, data were collected from teachers in HEIs in Africa. Our sampled countries were Ghana, Kenya, and Ghana. We employed convenience sampling based on the willingness of the respondents. Data collection took place in January 2022. The second, third, and fourth authors personally conducted the interviews in the countries they represent. For inclusivity and to be able to obtain a diverse range of responses, we ensured that there was diversity in teaching experience and disciplinary fields. Various approaches were used in accessing the respondents. In Ghana, three interviews were held face-to-face with a recorder, and the two other interviews were held [Guerrero et al](#) via Zoom. In Kenya, four

interviews were held via phone call while one was face-to-face in the respondents' office. In Nigeria, all the interviews are held face-to-face in the respondents' offices. In sum, we had fifteen respondents, comprising five from each of the three countries, thus marking a saturation point (Creswell, 1998). Per data analyses, data were transcribed first followed by repeated reading of the interview scripts to identify codes (Woyo & Ukpabi, 2022). As we already had a thematic guideline (Li & Liu, 2014), thus data were interpreted based on the set framework. Table 2.2 contains the details of the demographics of the respondents.

Table 2.2 Demographics of respondents

<i>Respondent code</i>	<i>Sex</i>	<i>Discipline</i>	<i>Rank</i>	<i>Years of experience</i>
Ghana				
GH1	Male	Health Promotion	Lecturer	4
GH2	Male	Health Administration and Education	Lecturer	4
GH3	Male	Physics	Lecturer	9
GH4	Male	Health Administration and Education	Lecturer (Head of Department)	5
GH5	Male	Chemistry	Lecturer	3
Kenya				
KN1	Male	Tourism	Professor	31
KN2	Female	Tourism	Assistant Lecturer	8
KN3	Female	Hospitality	Senior Lecturer	13
KN4	Male	Languages	Lecturer	17
KN5	Male	Strategic Management	Assistant Lecturer	11
Nigeria				
NG1	Male	Financial Accounting	Lecturer	15
NG2	Male	Anatomy	Lecturer 1	10
NG3	Male	Anatomy and Histology	Professor	16
NG4	Male	Geology (Petroleum Geology)	Senior Lecturer	13
NG5	Male	Biochemistry (Enzymology)	Senior Lecturer	15

Source: Authors

Results and findings

This section shows the findings of the interviews and is themed in line with Li and Liu's (2014) framework, thus, strategic sense-making capacity, timely decision-making capacity, and change implementation capacity.

Developing an IT roadmap for the HEIs

We needed to understand the position of HEIs in Africa in terms of the transformational effect of digital technologies in pedagogy and the various ways such digital technologies have been implemented. Sense-making capacity entails an organisation's sensitivity to the external changing environment and its efforts to cushion the effects of these changes while remaining competitive (Barreto 2010). Interestingly, all the respondents admitted their HEIs' acknowledgment of the transformational effect of digital technologies in pedagogy and the various efforts by their institutions to adopt digital technologies for teaching and learning. For effectively utilising sense-

making capacity, HEIs must have a strategic focus that identifies the uniqueness and cooperation of all relevant stakeholders most importantly, staff and students. To tap into the transformational effect of the digital technologies to enhance pedagogy, it is therefore imperative that HEIs must have a clear roadmap for the deployment of such digital platforms. Interestingly, the respondents could not pinpoint a clear digital roadmap in each of their institutions. For instance, in Ghana, GH3 has this to say:

Before the COVID-19? Yeah, I will say no, because consultation, no. I believe that if they mostly had an IT policy already in place for situations like the COVID-19, a broader consultation would have been done and management would have done broader consultations.

However, some training activities are ongoing to educate staff on the use of digital devices. In Nigeria, NG2 said:

Yes, I think the university has that. Because the University has already given us some training. The challenge is that the ICT has not connected us to the internet.

When considered on the backdrop of the organisational roadmap, it becomes challenging to understand if the IT roadmap exists. An IT roadmap defines the IT goal and desired outcomes and the major steps or milestones required to attain it. In most cases, it is written down and shared among all relevant stakeholders, including staff. Thus, if such roadmaps exist, obviously staff would be aware of them. Additionally, there were varied opinions when responding if the staff was consulted in developing the roadmaps. Asked if staff were consulted in developing the IT roadmap, NG1 responded:

Yes, I can remember the then Vice-Chancellor, the one before this present one. Yeah, he did make some efforts, which I believe this current Vice-Chancellor is continuing with. To put in place modalities to ensure that teaching is being taken from the analogy stage to a more advanced and digital setting. So, yes. There were meetings to ensure they come to this conclusion.

The meetings referred to could be those held among the principal officers and management team; teaching staff who are the core users of these platforms may not have been consulted. Interestingly, however, one common thread that ran through the interviews was that the respondents were able to identify one or two digital platforms used to enhance pedagogy in their respective institutions. For instance, in Kenya, Open Distance and Electronic Learning (ODEL) is very popular with most universities. ODEL is a locally developed learning management system (LMS), a form of, for instance, Moodle, that integrates various ICT tools. Most what teachers and students can do with Moodle is also provided in ODEL. However, this form of centralised LMS is peculiar to Kenyan universities. Respondents from Ghana and Nigeria could only point to the use of Zoom, Skype, and email, indicating a disjointed and disparate application of these tools in pedagogy.

In Kenya, private universities have a solid IT infrastructure that supports pedagogy. Not only that but staff are regularly trained on how to use such platforms. Some staff are deployed who solely ensure that staff queries about the platform are promptly resolved. According to KN3,

And ... online itself does the monitoring and they have ...they also log in and if they realize you're doing the wrong thing they will also correct you and the advantage we have is we are a small university, so we are not overwhelmed, and then their availability. They have their errr...a line you can call throughout, and during Covid what they did is they also introduced a WhatsApp such that people who are supposed to help us when we have hitches, they don't

have to be on campus for them to sort you. So, you can either do an email or a WhatsApp and you get a turnaround in 5 minutes

Moving pedagogy online during the COVID-19 lockdown

Moving teaching and learning online due to the restrictions imposed because of COVID-19 was challenging to many educational institutions. This study sought to know how African HEIs managed the transition to online. The transition to online learning varied across many HEIs. While some transited quite quickly, others struggled and even shut down for several weeks. For those who managed to transit online, the majority of students could not join in the online learning because of a lack of access to the hardware (e.g., laptops and smartphones) and internet facility. Connecting online requires internet access and a laptop, but the majority of students did not have these facilities. When asked how his university coped in transiting online, NG2 responded:

The university was not completely shut down. We were duly informed that we have transited to online teaching and learning, and the university has a collaboration with Google, but the challenge is that some of the students do not have the facilities for this learning.

Most universities had total lockdown before they started or gradually started implementing an online learning approach. When asked if his university in Ghana shutdown was, GH3 responded:

Yes, I would say was about a month and some weeks, less than two weeks. But sorry, less than two months, but more than a month to maybe you'll say, six weeks or seven weeks; As I said, because they had to do some training on how to use some of these tools

We also asked if transiting online was phased or instantaneous. Universities that phased their transition to online learning were mostly those with limited infrastructures such as manpower, IT tools, and weak internet network. There could have been a total collapse of the weak network infrastructure if everybody instantaneously transited online. In Kenya, KN2 said:

Because of course, it was slow at first but gradually it picked up. The university never entirely shut down after lockdown... I would say it came in phases because the semester that we had when the university closed, people we never really were into these online teaching, there was very little training then, so at first it was kind of slow, it only picked after some time. It took some time for it to pick.

Most universities, therefore, decided to apply the phased approach to be able to update their facilities. The phased approach also helped them to buy time because some governments at some points intervened and started releasing funds to educational institutions.

Experiences in transiting online

In this section, the study analyses the experiences in implementing online pedagogy. Implementing a change requires different levels of coordination and the ability of different actors to key into the strategic direction. The sudden transition to online pedagogy was met with different reactions. For some, it was quite challenging initially to follow while some others embraced it with comparative ease. Across the three countries of our focal interest, that is Nigeria, Ghana, and Kenya, there are marked differences in the implementation capacity of online pedagogy. Those who have had previous experiences with LMS were excited when news came that they would entirely move to learn online. This thought resonated mostly with the respondents in Kenya. According to KN3,

...there was excitement because you know we usually have this fatigue of driving to work every day so there was early excitement- I can work from my house. So there was no fear. There was happiness, it will be convenient for me...yeah. Both faculty and students were happy because we knew we had what it took to move online in an hour.

The excitement notwithstanding, some staff were also concerned about how students could be carried along especially as most of them lack digital devices, in addition to unstable electricity. When these concerns were raised, some authorities paid little or no attention to them because there were the bandwagon effect to transit since all universities were transiting online. Eventually, these concerns materialised. In Ghana, for instance, GH2 echoed some of the responses from the students who had challenges in using the platform.

...but I couldn't submit, we had the light of the day we were having the exams, I didn't have internet, others will say I don't even have a laptop, I don't even have an Android phone. So, all those concerns came to bear and I'm sure most universities had a challenge

Again, some concerns bothered job loss. From Kenya, those who expressed this feeling reasoned that transiting online would imply that their lectures would be recorded and could be replayed to students even after many years, thus a potential threat to their jobs. This is what KN5 said:

... means, if online learning continues the university, will have also to reduce the lecturers or staff because one staff can be able to take care of many students from different centres. Yes. So that also kills the staff morale. because you're afraid that maybe your future is not guaranteed.

Another critical point was the issue of quality assurance. There were various degrees of differences in quality implementation across the universities. Traditionally, all universities have quality assurance units. However, the implementation of quality in online learning platforms presented significant challenges because the existing regulations are significantly limited to their application to online pedagogy. In one university in Ghana, for instance, the IT unit took over the monitoring "at that time to ensure that teaching staff was using the tools to teach and interact with our students" (GH3).

For universities that do not have LMS but used platforms like Zoom, and Google Meet, lecture materials were emailed to students, but the quality assurance unit was copied in each of those emails. NG3 from Nigeria noted:

What they now did was to say concerning lectures, that for each of those lectures to be given out that they should also have a copy. They look at it and advise. But of course, you know, there's a limit to which they can control these things.

Compared to Nigeria and Ghana, Kenya's quality assurance looks most robust. This is because, just like ensuring quality in the physical teaching environment, provisions were made to ensure that students and staff adhered to laid down quality criteria. Some respondents mentioned that they preferred monitoring online because it was watertight compared to physical teaching. In this case, lecturers must ensure that all their course materials were uploaded online and designated staff from the administration unit checks these materials. The system also keeps records of lecture schedules and reports the degree of interactivity between the teachers and the students in each of those classes. In most universities, the quality assurance unit also continues its monitoring online. In some cases, heads of departments and deans also took part in the monitoring.

Discussion and implications

By utilising the dynamic capability theory and in-depth semi-structured qualitative interviews featuring academics in three African countries (Ghana, Kenya, and Nigeria), the core aim of this study was to explore the role of digitalisation on pedagogy among African HEIs during the COVID-19 lockdown. Findings indicate that all the surveyed HEIs are digitalised, however, the depth of digitalisation varies significantly across these institutions. As argued by [Li and Liu \(2014\)](#) strategic sense-making implies a clear road map developed through internal and external sensing with all relevant stakeholders. In our study, there is no apparent sign of a digital roadmap for the three countries. Interestingly, the study identified some forms of digitalisation such as the acquisition of hardware and software and the efforts to train staff on their use. However, the staff is not clear about the digital strategy for the institutions. This is because there were no sensing activities such as the engagement of staff and students. Such engagement is critical because through their experiences they could share views that critically shape the digital roadmap. This raises some confusion among the respondents as some confused a digital roadmap for the mere acquisition of digital devices.

The absence of a digital roadmap affected critical activities such as the non-availability of common platforms for communication within the HEI community. For instance, the majority of these HEIs use general email platforms such as Gmail and Yahoo. Many of them have no access to institution-based email. Again, when different governments-imposed restrictions due to the pandemic, some HEIs were completely lockdown with no academic activities for several months. When there was a need to resume academic activities, most of them engaged in disparate and uncoordinated use of platforms such as Zoom and Google Meet. Many students were not carried along because they lack access to critical hardware such as laptops and mobile phones. Another critical challenge was access to internet facilities. Most students never had access to internet facilities because it was unaffordable. Our findings indicate that there are no clear digital roadmaps for these institutions. A digital roadmap serves as a blueprint and strategically aligns all investments and activities focused on achieving the digitalisation objective of the institution ([Khalid et al., 2018](#)). As [Khoza and Mpungose \(2020\)](#) argued, most of these institutions were not digitally prepared because there were no compelling factors to embrace digitalised curriculum.

Some of these HEIs however have embraced a higher level of digitalisation because they already have different forms of LMS. Interestingly, however, most students could not enjoy the use of these LMS during the pandemic due to poor network facilities and a lack of basic IT infrastructure. This challenge resonated across the three countries. For those who could afford these IT devices, again lack of electricity hampered their access to the LMS. Extant research (e.g., [Dube, 2020](#)) has argued that a critical challenge to online learning in Africa is poor electricity supply. Putting all these challenges together, it appears that in terms of planning and policy, governments and relevant bodies do not prioritise a conducive learning atmosphere for the African student. As evidenced in prior studies, issues such as poor budgetary allocation constitute critical challenges to HEIs in Africa and their effects are more pronounced on the students ([Mgaiwa, 2018](#)).

Finally, our study found that attitudes to the use of digital tools remain poor in HEIs which aligns with previous findings (e.g. [Woyo et al., 2020](#)). When it was pertinent to transit to online pedagogy, most students and lecturers were reluctant to join. The fact that many of the lecturers have not been exposed to the digital tools before the lockdown and therefore could not embrace it as it was suddenly introduced during the pandemic. In line with the dynamic capability proposition, renewal represents the transformation of organisational capabilities into dynamic assets rooted within the practices that support the development of innovation ([Guerrero et al., 2021](#)). Thus, to be able to catch up with the digital transformations of HEIs in other parts of the world, HEIs in Africa must commence a process leading to the attitudinal transformation that welcomes and embraces digital culture. Thus, regular training programmes such as seminars, workshops, and symposiums for both students and lecturers

Theoretical implications

This study offers several theoretical implications. First, it extends the dynamic capability theory in the context of the use of digital technologies among African HEIs. Digital transformations represent a critical success factor for many organisations, including educational institutions. Thus, adopting Li and Liu's (2014) framework of strategic sense-making, timely decision-making capacity, and change implementation capacity, this study found an incoherent and uncoordinated digitalisation approach to HEIs in Africa. Second, this study is one of the first studies to compare the effect of COVID-19 on pedagogy among African HEIs. Among the three countries, Kenya was the most resilient because it already has a better digital infrastructure that supports online pedagogy. Thus, transiting online was not a major challenge for the universities that already had LMS. Finally, this study accentuates the report of the IAU which surveyed the global impact of COVID-19 on universities and other HEIs. While the report highlighted the challenges of African HEIs during the lockdown, this study undertook a deeper exploration of the root causes of those challenges to make solution-based recommendations.

Practical implications

Digitalisation among African HEIs is uncoordinated. There is therefore the need to establish a digital roadmap for HEIs. The digital road could help in emergency situations like the current COVID-19. This will involve all relevant stakeholders (the government, heads of HEIs, IT units, academic staff, and students) to come together, brainstorm, and draft a policy paper that serves as a guide for digitalisation. There should also be regular updates on what has been achieved, and what is needed. This digital roadmap should also embrace the time element so that everyone works towards the timeline. Second, to achieve the roadmap, there is a critical need to increase funding and investment in the digitalisation of the learning space. Governments across Africa should increase budgetary to HEIs, with digitalisation specially designated within the budget. To curtail mismanagement of the allocated funds, governments should also set up special committees comprising government officials, representatives of HEIs, lecturers, and students tasked with the oversight function of ensuring that released funds are rightly channelled to digitalisation. There should be special-purpose funding for students to enable them to acquire digital tools. Governments should subsidise the cost of laptops and smartphones for students and lower internet subscription fees for them. In Ghana, during the lockdown, the Ministry of Education directly intervened by dialoguing with the telecommunication companies to give free internet access to students who are logged in to the LMS. This could be a model for other countries. Finally, the government should encourage the sustained use of the LMS and encourage a hybrid learning approach. The intensity of competition among HEIs has triggered the setting up of MOOCs to reach people without geographical boundaries. With the best-ranked universities across the world speeding up the establishment of MOOCs, HEIs in Africa must join now. To ensure the wide adoption of MOOCs, efforts should be made to outlaw the long-held policy that views online degrees as inferior to on-campus programmes.

Limitation and future research direction

One of the limitations of this study was the question of generalisability. Data were obtained from only three countries in Africa. Among the three countries, data collection was limited to a single university. This study, therefore, calls for a quantitative study that can embrace multiple universities across African countries. The layout of the questions and key discussion topics in the semi-structured interview was based on Li & Liu's (2014) framework of dynamic capability. Admittedly, dynamic capability theory has many contextual applications with varied frameworks. Thus, this study could have missed a more suitable framework. Despite these limitations, it is believed that this study

expands on the report of IAU and goes further to advance policy issues that could advance the digitalisation of HEIs in Africa.

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