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## Mapping the Way Forward for Post Pandemic Digitalization of Higher Education Administration, Teaching and Learning: A Systematic Literature Review

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# Mapping the Way Forward for Post Pandemic Digitalization of Higher Education Administration, Teaching and Learning: A Systematic Literature Review

Research Paper

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## ABSTRACT

The post COVID—19 era signals an epoch that arose after the crisis of the pandemic. This therefore requires higher education institutions (HEIs) to embrace digitalization in administration, teaching and learning as a contingency measure in case of future disruptions. This systematic literature review paper explores the challenges and opportunities presented to HEIs by the pandemic with a view to mapping the way forward through digitalization. The study applied a literature search strategy on seven electronic databases which yielded a total of 5 462 articles. Following an inclusion and exclusion process, 36 articles were found eligible for this study. The findings indicate that though HEIs have taken strides towards digitalization, successful implementation remains underachieved particularly in developing economies. The study recommends the development of digitalization models for HEIs that are country specific. This will ensure an inclusive approach in higher education post the pandemic in line with the Sustainable Development Goals.

**Key words:** literature review; digitalization, model; higher education institutions; pandemics, way forward.

## INTRODUCTION

Higher Education Institutions (HEIs) have a fundamental role to play in enhancing the development and nurturing of demand—driven digital and technical skills. The pandemic revealed the virtues of moving to a digitally delivered educational experience in a developing country (Marinoni, 2021). This shift from face—to—face to distance teaching came with challenges, the main ones being access to technical infrastructure, competences and pedagogies for distance learning (Zezeza and Okanda, 2021). Digitalization in the context of HEIs involves summation of all digital processes required to accomplish a transformation process that gives HEIs the opportunities to positively apply digital technologies optimally (Machekhina, 2017). Bejinaru (2019) views digitalization as the transition of traditional forms of teaching and learning into the virtual environment that is online courses, online exams and web—seminars through the aid of electronic platforms. These electronic platforms include, but are not limited to FaceTime, Google Hangouts, Skype, Microsoft Teams, Zoom, or WhatsApp (Daniel,2020; Ray;2020).

On justifying the importance of digitalization in HEIs, literature suggests that student information systems make student affairs tasks easier. Such tasks include enrolment, course registrations, billing of student accounts and access to library e—resources (Fernandes, 2020; Gillpatrick, 2020; Saykili, 2019). Digital libraries and learning management systems enable learners to access course resources regardless of time and space. Guangul et al., (2020) opines that digitalization helps to reduce the administrative costs of HEIs and to refocus towards the same basic tasks.

Dagogo (2021) however notes that, while HEIs make use of the digital technologies effectively in terms of logistical support, policies regarding the provision of these systems are

not developed as required. He further argues that although HEIs made the dramatic sudden shift to online learning during the pandemic, online examinations are still a distant thought. The administration lacks technical know—how and infrastructure to conduct remote examinations and academic staff are not sufficiently aware of alternative modes of assessment. Students are at the receiving end, trying to cope with the change in their learning environment (Babbar and Gupta, 2022, Tomte et al., 2018).

A systematic literature review approach is justifiable for highlighting the challenges and opportunities that the pandemic presented to HEIs on the digitalization front. This approach will assist with establishing the milestones and whether HEIs have successfully implemented digitalization in administration, teaching and learning. The systematic literature review further proposes digitalization models that will enable HEIs to effectively digitalize in the wake of the challenges presented by the COVID—19 pandemic. This work therefore goes beyond the approach taken by other systematic literature reviews in approaching the digitalization discourse.

A comprehensive systematic literature search was conducted on 7 databases to identify relevant studies. The literature search was restricted (search filter) to identify only studies published between 2018 and 2022. While the study focuses on the current situation, the literature search was limited from 2018 in order to get an appreciation of the situation in HEIs before the COVID—19 pandemic. Studies were eligible for inclusion if they addressed digitalization of HEIs, e—learning during the COVID—19 pandemic, digitalization challenges and opportunities in the era of COVID—19. As the COVID—19 pandemic is viewed as a catalyst to digitalization in HEIs, the scenario was seen as a relatively recent development hence the date range would cover a sufficient time period.

## **REVIEW QUESTION**

What is the role of digitalization in mapping the way forward in post COVID—19 higher education administration, teaching and learning?

## **METHODOLOGY**

This section presents the methodology that was followed in conducting the systematic literature review process. The procedures involved selection of the literature search strategy. The Sample, Phenomenon of Interest, Design, Evaluation, and Research Type (SPIDER) literature search strategy was adopted. The literature search process was conducted through an exclusion and inclusion criteria. An overview of the articles included in this study is also presented in this section.

### **Literature Search Strategy**

This study utilized the SPIDER literature search strategy proposed by Cooke, Smith and Booth (2012). The SPIDER literature Search terms for the strategy were Digitalization, E—learning, Digitalization Challenges, Teaching and Learning, Higher Education and administration,

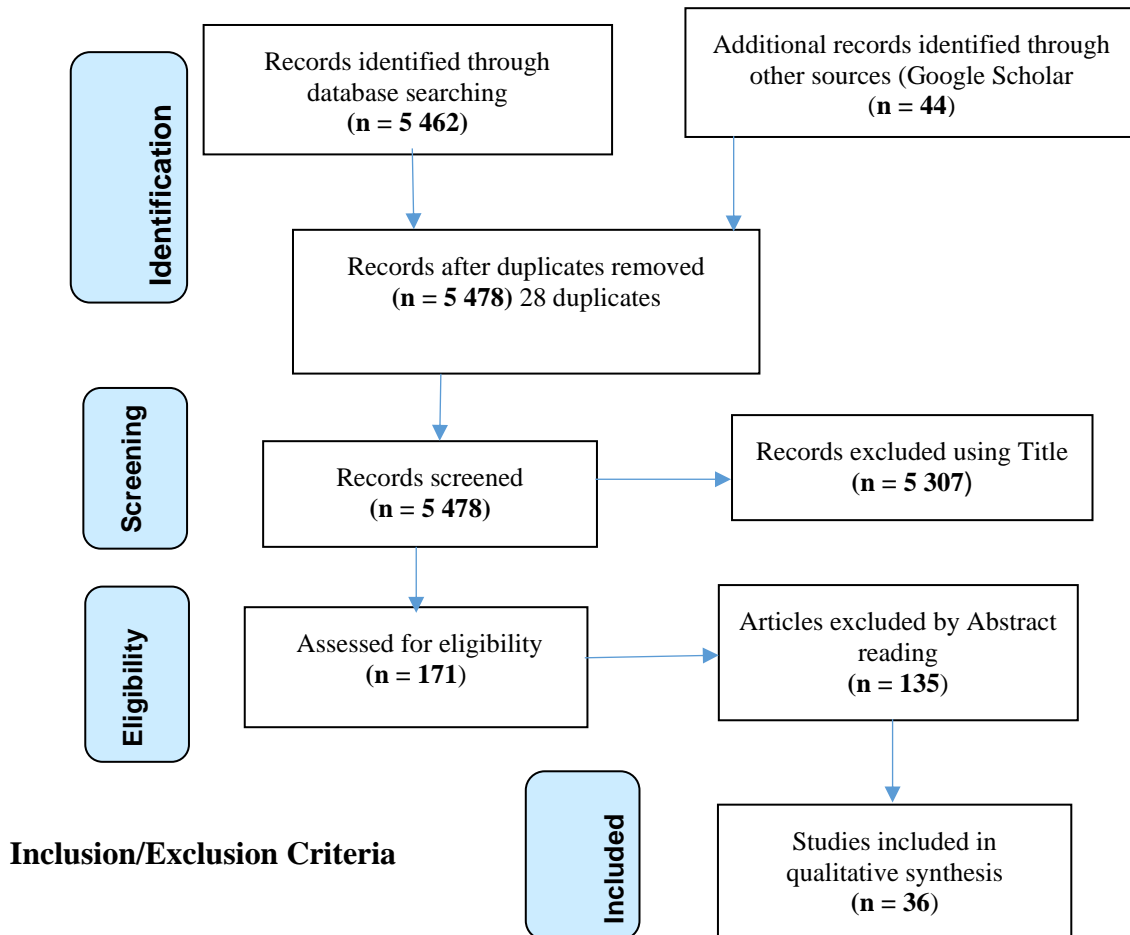
COVID—19. The systematic literature review involved a systematic search of electronic databases including Emerald, JSTOR, ProQuest Central, Sage, Springer, Taylor and Francis as well as Google Scholar. The SPIDER literature search strategy employed in this systematic literature review is presented in Table 1 below.

**Table 1. Spider Literature Search Strategy**

Sample	Public Higher Education Institutions
Phenomenon of Interest	Digitalization of higher education institutions OR digitalization, mitigatory measures during the COVID—19 pandemic OR Digitalization Challenges
Design	Descriptive, Explanatory, Correlational
Evaluation	Experience OR attitude OR perceptions OR public institutions of higher learning OR digitalization
Research Type	Qualitative OR quantitative OR mixed methods

Boolean terms And/ Or were used in the literature search strategy: And was used to limit the search as it yields documents that contain both search words and OR to expand the search as it yields documents that contain either of the search words. The study was confined from 2018 to 2022 in order to synthesize evidence on contemporary strategies employed to mitigate the impact of the COVID—19 pandemic in HEIs. The Preferred Reporting Items for Systematic Reviews and Meta—Analysis (PRISMA) was utilized as a flowchart to present the literature search process (Page et al., 2020). The PRISMA flowchart illustrating the literature search process is presented in Figure 1 below.

## Flow Chart of the Literature Search Process



**Figure 1.** Literature Search Process

The systematic literature search yielded a total of 5 462 articles. After removing duplicates and screening using title, 5 307 articles were removed, leaving 171 articles. Using abstracts, 135 articles were discarded, leaving 36 articles. After removing articles that did not meet the inclusion criteria, 36 articles were found eligible and used as evidence synthesis in this study. An overview of the included articles is shown in Table 2 below.

## OVERVIEW OF INCLUDED ARTICLES

**Table 2. Overview of Included Articles**

Theme/Findings	Citations
The Impact of COVID—19 on Higher Education Institutions	Ali, 2020; Chibaya et al., 2021; Dagogo, 2021; Elfirdoussi,2020; Morales et al.,2021; Mseleku,2020; Saykili,2019; Shahriar et al., 2021; 2019; Soykan, 2020; Marinoni et al., 2021
HEIs Blended Learning Approaches in the course of the COVID—19 pandemic	Adarkwah,2021; Ibrahim and Muesser, 2019; Medina, 2018;
Student’s Perceptions on Digitalization in HEIs	Al—Dosari 2020; Dookhan 2021; Mensah et al,2022; Novikova, 2022
Challenges confronting digitalization in Higher Education Institutions	Aboagy,2020; Abdullahi et al, 2020; Adarkwah,2020; Adarkwah,2021; Agormedah et al, 2020; Fasasi, 2020; Ifijeh & Yusuf, 2020; IESALC, 2020; Maqbool et al., 2022; Medina,2018; Mseleku,2020; Ogona, Oyediran et al., 2022; Shahriar, 2021; Stevens et al., 2021; Stukalo & Simakhova, 2020; Teferra, 2020
The digital divide and digitalization of higher education institutions	Adarkwah,2021;Abdullahi et al., 2020; Adarkwah, 2021; Addae,2022; Dagogo, 2021 Gupta,2022; Kavaric,2021; Ndzinisa, 2022; Morales et al.,2021; Shava,2022; Sintema & Singogo, 2021
Digitalization as a way forward in higher education administration, teaching and learning	Ali, 2020; Chadda et al., 2021; Coman et al,2021; Efirdoussi et al., 2020; Maqbool et al., 2022; Mseleku, 2020; Shava,2022; Stevens et al., 2021

The overview of the included articles comprises a synthesis of knowledge that is grounded in the information extracted from the individual research studies included in this review. The distribution of the articles were Asia (n=10), Africa (n=10), Europe (n=8), unspecified (n=8).

## LITERATURE REVIEW FINDINGS

This section presents findings from the systematic literature review where the following themes emerged; the impact of the COVID—19 pandemic on HEIs globally, blended learning approach during the COVID—19 pandemic, student’s perceptions on digitalization in HEIs, challenges confronting digitalization in HEIs, the digital divide and HEIs, digitalization as a

way forward in higher education administration, teaching and learning. The themes that emerged from the systematic literature review are presented below.

### **The Impact of COVID—19 Pandemic on HEIs**

The impact of COVID—19 on HEIs is highlighted in a number of articles that were reviewed in this study. The findings of this study revealed that the crisis brought about by the pandemic is serving as a catalyst in intensifying the adoption of online learning in most HEIs globally (Chibaya et al., 2021; Dagogo, 2021). In developing economies, there is a pervasive crisis in teaching and learning management systems and this problem has been compounded by the COVID—19 pandemic (Morales et al., 2021; Soykan, 2020). Most educational institutions in developing economies joined the league of developed economies by migrating to the online modality of instruction to ensure lifelong education during the pandemic. The pandemic therefore stimulated the appetite of most HEIs in coming up with educational innovations to counteract the disruption in higher education. (Chadda et al., 2021; Marinoni et al., 2021).

The study notes that online learning is a challenge and not effective in developing economies as compared to those that are developed. Literature reviewed concurs that online learning thrives on ICT resources which have not significantly evolved in developing economies (Ali, 2020; Chibaya et al., 2021; Dagogo, 2021; Elfirdoussi, 2020; Morales et al., 2021; Mseleku, 2020). The study revealed that the sudden transition from regular to virtual mode was not an easy task for students either as they struggled with staying on their digital devices for long periods.

### **HEIS BLENDED LEARNING APPROACH IN THE COURSE OF THE COVID—19 PANDEMIC**

The study notes that very often, HEIs launch blended learning projects without considering how blends should be made or how a smooth integration between academic and administrative aspects may be best achieved (Adarkwah, 2021; Medina, 2018). This was seen as a common phenomenon within HEIs during the COVID—19 pandemic. Similarly, Adarkwah (2021) opines that blended learning should be viewed as an opportunity to redesign the way that courses are developed, scheduled, and delivered in higher education. Ibrahim and Muesser (2019) corroborate that during the pandemic, blended learning surpassed barriers of time and place and had a direct positive influence on students' learning outcomes. Before the pandemic both teachers and students had to be physically present in a classroom for the purposes of teaching, examinations, thesis defense, and seminars. On the contrary, Medina (2018) suggests that there remains a mismatch between theory and practice. The actual design and implementation of blended learning programs and courses does not always comply with what are recognized as ideal best practices (Adarkwah, 2021; Medina, 2018).



## **Student's Perceptions on Digitalization of HEIs**

The study revealed that challenges facing most HEIs are associated with dearth of ICT infrastructure, unstable internet access, and the unavailability of digital devices. Lack of digital competence of students and teachers are among the main restrictions on the use of distance learning during the pandemic (Al—Dosari 2020; Dookhan, 2021; Novikova, 2022). Mensah et al., (2022) contend that perceived ease of use influences both the intention to use and perceived usefulness of an e—learning system. Dookhan (2021) argues that the attitude of the students improves when they perceive that e—learning systems are easy to access. He further contends that e—learning enhances students' learning experience and increases their engagement with the lectures. Al—Dosari (2020) concludes that accessibility, flexibility, and collaboration are the most significant benefits of online learning according to students.

## **Challenges Confronting Digitalization in HEIs**

Among the challenges confronting digitalization in HEIs is the fact that not all students have access to the internet and digital devices (Chadda, 2021; Maqbool et al., 2022; Stevens et al., 2021). The study revealed that HEIs also struggle with keeping the content of the course consistent and relevant, communicating clearly with the academic community, and also with acquiring and recruiting students (Adarkwah, 2021; Shahriar, 2021; Ogon, 2022).

The major challenge with blended learning is that of making students aware of online materials available as well as training them and staff on the use of online materials (Medina, (2018; Shahriar, 2021). These challenges also include arranging online classes, conducting online teaching as well as monitoring the effect and quality of online teaching (Chen et al., 2020; Shahriar, 2021). Further literature evidence shows that some academics lack sufficient knowledge of information technology and their understanding of online teaching is relatively poor (Chen et al., 2020; Maqbool et al., 2022; Shahriar, 2021).

The study revealed that HEIs students from developing economies are still faced with unique challenges. Some of the challenges affecting students include the provision of ICT gadgets for learners who lack ICT resources and lack of ICT literacy skills of users (IESALC, 2020; Stukalo and Simakhova, 2020; Teferra, 2020). Female students are engaged in house chores which affects their level of concentration when they learn from home. (Aboagye, 2020; Agormedah et al., 2020; OwusuFordjour et al., 2020).

Challenges confronting digitalization in HEIs also include lack of preparedness, inconsistency in syllabus coverage, less supervision by lecturers and limited access of online instruction by students (Abdullahi et al., 2020; Fasasi, 2020). Furthermore, disparity of content offered from one program to another and the perception that online instruction is time—consuming have also been identified as challenges affecting HEI students (Ifijeh & Yusuf, 2020; Oyediran et al., 2022). Poor internet infrastructure and unavailability of online reading materials are major obstacles towards the effective implementation of digitalization in HEIs (Mseleku, 2020).

## **The Digital Divide and Digitalization of HEIs**

The digital divide is a threat to Sustainable Development Goal number Four (SDG 4) and the No Child Left Behind Act (NCLB) in developing economies. Only a third of the population in Africa has access to broadband connectivity (Adarkwah, 2021; Abdullahi et al., 2020; Sintema and Singogo, 2021). The digital divide is also widened by learning abilities, disabilities gap, as well as low and high socio—economic background inequality (Dagogo, 2021; Ndzinisa, 2022; Kavacic, 2021). Furthermore, Addae (2022) asserts that the switch to digital learning platforms revealed the entrenched inequalities in the education system. The “haves” have an edge over the “have—nots” in access to education contrary to the achievement of SDG4 which calls for inclusive and equitable quality education and promoting lifelong learning opportunities for all (Abdullahi et al., 2020).

Adarkwah (2021) concludes that the sudden transition from face to face to online learning exposed the digital divide in Sub—Saharan Africa’s HEIs. This phenomenon concurs with Shava (2022) who laments that COVID—19 exposed the deep structural inequalities among students due to the inaccessibility of ICT, the internet and modern technological devices. Morales et al., (2021) notes that the digital divide can also be applied to academic staff. Not all faculty members are comfortable in an online setting. The generational divide may separate those who have relied on classical methods and never used technology tools from the younger faculty staff and administrators who may be more adept with newer technologies.

### **Digitalization as A Way Forward in HEIs Administration, Teaching and Learning**

The findings of this study exhibit the benefits of digitalization in HEIs. There is a general consensus in literature that learning management systems provide various assessment methods to instigate a grasp of the knowledge being communicated to the students. Frequent and different kinds of assessments also encourage students to allocate more time for in—depth studying (Elliot and Talent, 2018; Onyeawuna and Ogona, 2022).

Findings have shown that the ability to stay at home is the most commonly observed positive outcome of e—learning among students followed by learning at ones pace (Maqbool et al., 2022). The pandemic has therefore provided an opportunity for most HEIs to recognize the possibility of expanding through internationalization and distance learning. Distance learning offers flexible learning to students which can meet the different needs of the diverse range of students (Elfirdoussi et al., 2021; Medina, 2018; Morales et al., 2021; Onyeawuna and Ogona, 2022). Digitalization therefore brings diversity in HEIs as it allows universities to cater for students with diverse profiles. Distance education offers HEIs the opportunity to reach and cater for the large number of students in various locations. It also facilitates student support as the online environment provides new forms of interaction and learner support (Mseleku, 2020; Shava, 2022).

## **DISCUSSION OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS**

This section discusses the findings of the study in relation to the main research question which is; What is the role of digitalization in mapping the way forward in post COVID—19 higher

education administration, teaching and learning?. The section concludes by presenting limitations of the study and recommendations for further research.

### **Discussion of Findings**

Literature reviewed in this study revealed that the learning management systems that were already in use in most HEIs facilitated attendance, student registration and content distribution. The learning management systems were however not suitable for full—fledged virtual classes. Technologically advanced nations such as France, Australia, USA, and United Kingdom had readily adopted distance learning as a course of action by strengthening their existing e—learning platforms. Contrarily, nations such as Chile, Argentina, Brazil and indeed most countries in Sub—Saharan Africa lack sufficient infrastructure and therefore employed traditional methods such as radio and television to ensure undisrupted learning during the pandemic.

The systematic literature review revealed that both online and offline study modes have been accepted by students depending on the availability of IT infrastructure. The COVID—19 crisis has therefore become a golden opportunity to re—think outside the box and come up with new improved digitalized higher education systems that meet the attendant needs of the present and future settings. The COVID—19 pandemic should therefore be seen as a vital catalyst for digitalization, innovation, transformation, and reform of higher education administration, teaching and learning systems.

The closure of HEIs as a result of the COVID—19 crisis reveals how educational institutions adapt to meet the needs of students and education staff. Abilities to apply ICT in every sphere of life are on incremental level. Universities must therefore be up to the task of preparing potential professionals to be able to face challenges and provide solutions and this transformation.

This work highlights the significant importance of digitalization in the learning process as it has the ability to improve the quality of learning in HEIs. Due to its flexibility, digitalization of administrative services, teaching and learning eliminates barriers of space and time as the user can have access to a wide range of information online. Digitalization facilitates collaboration, allows students to learn in their own rhythm and motivates them to interact with their peers, discuss and exchange points of view. Online learning is faster, saves time and financial resources since it does not involve traveling. Furthermore, the uploaded content is consistent and can be easily updated. The benefits of digitalization in HEIs also seen in its potential to promote expansion of the programmes and intakes through internationalization and distance learning.

On the contrary, the findings show that the usage of ICT in modern day societies is based on access, attitudes, discourses, skills, and availability of infrastructures that are connected to individual societal domains and life chances. Though there are many perceived benefits of digitalization in higher education institutions, technological challenges have remained a major challenge. This has affected the roll out and adoption of ICT's in administration, teaching and learning process in HEIs as the systematic literature review has revealed.

This study has shown that though there are many opportunities presented to HEIs through digitalization, the digital divide remains a challenge. The disruptions posed on the university's education system during the pandemic forced some students to defer their studies as they were facing challenges in accessing online learning. Findings revealed that learners from rich socioeconomic households had more access to quality online learning experience than their counterparts from poor households due to limited resources.

The study revealed that online learning is still a challenge and not as effective in developing economies. The ICT resources that online learning thrives are still a challenge in developing economies. Dearth of ICT infrastructure, unavailability of digital devices and internet connectivity is seen as a major contributory factor that is adversely affecting online learning in developing economies. Some HEIs launched blended learning without considering how the programme would be implemented. This resulted in mismatches between theory and practice. Notably, the findings showed that the digital divide also affects HEIs academic and administrative staff. As a result of generational gaps and lack of exposure to ICTs some HEIs academic and administrative staff struggled with delivering their classes virtually.

From a gender and diversity perspective, male and female students' experiences during the pandemic were not the same. Findings showed that the ground may not be equal when it comes to online education. Female students have domestic and caregiving duties to take care of, whilst their male counterparts have responsibilities that relate to them as members of a family. On the other hand, a number of students living with disabilities such as visual impairment did not have special arrangements made for them to access learning management systems and digital administrative services. The systematic literature review highlighted the need for HEIs to adopt inclusive approaches when designing learning management systems and digital platforms for services such as applications, registration, billing and library services. The study observed that, HEIs globally need to revisit the blended learning approach and evaluate how a smooth integration between academic and administrative aspects may be best achieved.

## **Conclusion**

The study concludes that the COVID—19 pandemic strained HEIs beyond their limits due to unforeseen challenges particularly in developing economies. As aptly stated by Selwyn (2018), the instructive approach did not take into consideration the messy realities of students engagements with digital technology. Under these circumstances, the inferiority of under—resourced communities resulting from historical factors of inequality such as higher income inequalities, poverty and household wealth were made visible. The study concludes that the pandemic has been a catalyst for positive change towards digitalization of HEIs through innovative ways of instruction and learning that had to be considered. Digitalization has the potential to promote expansion of HEIs though distance learning and internationalization. The opportunities presented by the pandemic to HEIs are testimony to the role played by digitalization in mapping the way forward post the COVID—19 pandemic.

## **LIMITATIONS**

Typically, all studies are prone to some limitations. This study applied an exploratory approach through the use of secondary sources where data was generated through a systematic literature review. The literature search yielded more articles from Europe and Asia as compared to Africa and other parts of the world. However, the findings of this work provide a strong basis for in—depth studies in the area of digitalization of HEIs post the COVID—19 pandemic.

## **RECOMMENDATIONS FOR FUTURE RESEARCH**

This study concludes that there is need for research on the development of higher education institutions' digitalization models that are country specific. This will enable HEIs to effectively set up robust digitalized administration, teaching and systems within an inclusive approach framework. Such digitalization models will be developed cognisant of the challenges presented by the digital divide in specific countries. These digitalization models will guide the adoption, implementation, monitoring and evaluation of digitalization programmes in HEIs and contribute significantly towards the attainment of SDG4. Digitalization models cannot be applied through a one size fits all approach as some economies are still developing.

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