EVALUATING TEACHING AND LEARNING IN HIGHER EDUCATION INSTITUTIONS IN A POST-COVID ERA: A REVIEW

Linda Tsevi, PhD[1]

ABSTRACT: The COVID-19 pandemic has affected all global spaces. Higher education institutions were not left out of the effect of COVID-19 as it impacted the teaching and learning needs of both faculty members and students. Through a comprehensive literature search, this paper explored teaching and learning in higher education institutions in a post-COVID era as a consequence to the pandemic. This review examined nine databases for peer-reviewed articles and book chapters published between 2020 and 2021 relating to the COVID-19 pandemic and higher education. The search terms used were 'COVID-19', 'blended learning', 'higher education', 'online learning', and 'post-COVID era'. Studies were eligible for inclusion if they related to the aforementioned items. The literature search revealed that higher education institutions in some countries, were least prepared to address the disruption that the pandemic caused especially in terms of availability of technological infrastructure**.** However, they adapted to the situation by being innovative and using available technological resources, though not without challenges. Further, the review indicated that COVID-19 has legitimized the acceptance of online education in most developing countries where traditional teaching methods have been the most recognized form of teaching and learning. Therefore, there was a need for retraining faculty members and support staff in digital literacy. Some of the teaching and learning methods that were adapted have continued even in the post-COVID era. Higher education in Sub-Saharan Africa, especially, has recognized the need for investment in extensive ICT infrastructure and the adaptation of a blend of face to face and online engagement of students. Varied ways of student assessment and innovative methods of teaching have been adopted. COVID-19 has fast-tracked higher education institutions' digital transformation by expediting the adoption of digital technology. The digital inequality educational divide has also been shown in the post-COVID era among others.

Keywords: blended learning, COVID-19, online learning, higher education, post-COVID era

COVID-19 has impacted educational institutions at all levels globally. Higher education institutions were not left out of the effect of COVID-19 as it affected the teaching and learning needs of both faculty members and students. The COVID-19 pandemic left in its wake disruptions to the lives and activities of staff, students, faculty and administrators of higher education institutions. It presented a major test to higher education institutions especially in terms of teaching and learning engagement of students while affecting faculty members and staff. Globally, most countries closed down higher education institutions at the onset of the pandemic. However, as it became clear that the pandemic would continue beyond a few months, higher education institutions transitioned to online learning. While this occurred across the globe, most countries, especially in the south, did not have the requisite infrastructure (Arnhold, 2020; Tsevi, 2021). At the height of the pandemic, the mode of teaching shifted from face-to-face to online or a blend of both at most higher education institutions. Countries in the global south had to be innovative so that their educational sectors were not further disadvantaged especially in terms of quality (African Union, 2020). Higher education institutions, especially those in the global south that were least prepared for the effects of the COVID-19 pandemic, had to quickly adapt and find innovative ways to address the teaching and learning demands that arose (Daniel, 2020).

[1] Senior Lecturer and Coordinator of the Accra Learning Centre, School of Continuing and Distance Education, College of Education, University of Ghana. Email: ltsevi@ug.edu.gh

A qualitative study of three middle eastern countries-Jordan, Lebanon and Pakistan, revealed that COVID-19 exposed inadequate technological infrastructure in all three countries. However, Jordan had an edge over Lebanon and Pakistan in that it had pre-existing infrastructure for online learning (Moghli & Shuayb, 2020). Transitioning to online learning in the three countries was also fraught with challenges such as power cuts, slow internet, and usage of technological applications such as Zoom and WhatsApp which impacted the quality of education given to students (Moghli & Shuayb, 2020). A survey of European and Central Asia (ECA) countries, indicated those who moved teaching and learning online with ease were those that had invested in digitalization strategically. Some of these countries include Finland, France, and Germany. In contrast, other ECA countries such as Bulgaria, Georgia, and Uzbekistan, that had not funded strategic digitalization struggled with their educational sector. This included higher education when the COVID-19 pandemic struck (Brajkovic et al., 2020). However, a study of the experiences of three higher educational institutions in the United Arab Emirates indicated that lessons learnt during the pandemic will be used to enhance online learning (Ashour et al., 2021). In the African sub-region, higher education institutions have had to find varied methods of engaging students during and after the peak of the pandemic (African Union, 2020; Kajita, 2021; Nawangwe, 2021; Tsevi, 2021).

Today's generation of traditional higher education students have experienced and grown with online media such as internet and artificial intelligence while COVID-19 brought even greater necessity for digital skills (Iansiti & Richards, 2020). Public higher education institutions that had Learning Management Systems in place were better prepared to switch to the online learning mode than those that had not invested in such infrastructure (Tsevi, 2021). Considering the impact of COVID-19 on the higher educational sector, this study reviewed literature about the evolution of teaching and learning in higher education institutions in a post-COVID era. Thus, the overarching research question guiding this study is: a) how has teaching and learning in higher education institutions evolved in a post-COVID era? The outcome of this review may inform the necessity of requisite digital transformation of higher education institutions in a post-COVID era especially in the global south. According to data from UNESCO, more than 1.6 billion learners in over 190 countries were affected by the COVID-19 pandemic, and this number represents 94% of students worldwide, including those at the elementary level (UN, 2020; DeVaney et al., 2020).

Methods

This review was guided by the procedures propounded by Kitchenham and Charters (2007) about conducting a systematic literature review. According to Kitchenham and Charters (2007), the review must begin with clear research question(s) to guide the process, indication of databases chosen, the search items and the selection and assessment of the studies. This review examined the implementation of online and blended learning undertaken by higher education institutions in a post COVID-19 era, as well as the evolution of teaching and learning as a consequence to the pandemic. The associated opportunities and challenges are also addressed.

Database and Search Terms

This review examined databases for peer-reviewed articles and book chapters relating to the COVID-19 pandemic and higher education published between 2020 and 2021. The databases (as shown in Table 1), were Academic Search Complete, African Journals Online, Education Research Complete, Humanities International Complete, JSTOR, Project Muse, ProQuest Ebook Central, SAGE Journals and Scopus. The search terms used were 'COVID-19', 'blended learning', 'higher education', 'online learning', and 'post-COVID era'.

Table 1. *Selected Databases*

Database	Total Number of Results	Peer Reviewed Papers/Books	Included for Literature Review
Academic Search Complete	180	180	8
Humanities International Complete	140	140	0
Education Research Complete	985	985	2
African Journals Online	49	49	6
JSTOR	45	45	2
SAGE Journals	383	383	4
Project Muse	30	30	3
ProQuest Ebook Central	6	6	2
SCOPUS	30	30	2
Total	1848	1848	29

Inclusion and Exclusion Criteria

Peer-reviewed articles and book chapters written in English between 2020 and 2021 and with full texts available were selected. The selected articles and book chapters focused on the search items 'COVID-19', 'blended learning', 'higher education', 'online learning', and 'post-COVID era'. Non-academic publications that were not linked to any search item were excluded. Research publications not written in English were not added. Publications that had not gone through the peer review process were also not included. Further publications whose full versions were not available through subscription from the researcher's institution were not added. The inclusion and exclusion criteria were validated by one university faculty member who has a background in higher education.

Review

Peer-reviewed articles and book chapters that satisfied the listed search items and the research question were selected. The search resulted in 1,848 publications which were then filtered to remove duplicates and unrelated articles. A review was then conducted to ascertain the importance of the selected studies to the proposed research question. This review discarded 1,819 publications as either duplicates or not having relevance to the

research question for this review. Thus, the remaining total of 29 publications fit the protocol developed in the methods section and were included in this study.

Results and Discussion

In this unit, answers are provided to the research question by analyzing the selected articles. The research question is 'How has teaching and learning in higher education institutions evolved in a post-COVID era?' The outcomes have been synthesized and delineated into themes such as availability of technological infrastructure, legitimization of online learning in countries where traditional teaching methods have been the most recognized, retraining of faculty members and support staff in digital literacy, attention to student mental health in a post-COVID-19 era, adaptation of a blend of face-to-face and online engagement of students, fast-tracking higher education institution's digital transformation by expediting the adoption of digital technology, revision of academic calendars of many higher education institutions, and generating new assessment methods.

Availability of Technological Infrastructure

The COVID-19 pandemic obliged higher education institutions to seek other means of teaching and learning engagement with students. Research indicated that countries that had invested technologically in higher education prior to COVID-19 were better prepared to transition to online learning than those that lacked the requisite technological infrastructure. In Europe and Central Asia, countries such as Germany, France and Denmark were better prepared to transition online than those that lacked the technological infrastructure. Countries that lacked this infrastructure in East and Central Asia, and reported 40% of the population as not having regular access to internet includes Bulgaria, Uzbekistan and Georgia. In Sub-Saharan Africa, higher education institutions had the challenge of providing adequate technological infrastructure on campuses where there were unstable Wi-Fi hotspots as well as foster digitalization. Moreover, students in rural areas and in some public institutions engaged in online learning also had a challenge of accessing stable internet, unreliable power supply, and noisy home environments (Badat, 2020; Zeleza & Okanda, 2021; Zinyemba et al., 2021).

Technological challenges affecting online instruction across the globe include weak internet speed, lack of devices, lack of inadequate space for faculty or students to engage meaningfully online. These impacted the development of the student's soft skills (Brajkovic et al., 2020). In Sub-Saharan Africa, institutions that had technological infrastructure and a Learning Management System in place were able to leverage them and enable online learning (Tsevi, 2021). Research further indicates that the existing online infrastructure at some higher education institutions did not allow for an extensive roll out of online learning until they were upgraded (Brajkovic et al., 2020; Ewing, 2021; Kajita et al., 2020). Higher education institutions in Sub-Saharan Africa, have recognized the need for investment in extensive ICT infrastructure and the adaptation of a blend of face to face and online engagement of students (African Union, 2020).

Legitimization of Online Learning

Research indicated that COVID-19 has legitimized online learning in the higher education sector because of the benefits associated with it (Ashour et al., 2021; Ewing, 2021). In developing economies, the pandemic has obliged the adoption of online learning, even though these are not without their challenges (Kang, 2021). Research has also shown that COVID-19 has greatly influenced faculty and students' adoption of virtual learning environments (Lola et al., 2021; Macharia, 2021). It is suggested that an increase in the online learning experience of students will contribute to its further development and acceptance (Ates-Cabanoglu & Cobanoglu, 2021).

Retraining of Faculty Members and Support Staff in Digital Literacy

The outcome of the review indicated the need to provide training to both faculty members and support staff as some were not equipped with the capacity to fully switch online (Brajkovic et al., 2020; Ewing, 2021). In Sub-Saharan Africa for example, a public higher education institution had to retrain its faculty and support staff to enable a smooth migration to online teaching and learning (Tsevi, 2021). According to Kajita et al., (2020), students, faculty as well as the institutions' management were not well prepared in implementing a fully pledged online learning system when COVID-19 struck. This instance of unpreparedness requires the training of all stakeholders and their capacity built in digital literacy.

Student Mental Health

Research indicated a global anxiety as a result of the COVID-19 pandemic (Cao et al., 2020; Holmes, 2020; Kaparounaki et al., 2020; Pragholapati, 2020). Studies carried out among students indicate that anxiety levels increased significantly during the pandemic and post-COVID-19. Thus, there was a need for psychological interventions to assess needs and appropriately address them. In a study by (Zhong et. al., 2020) using the COPE Brief procedure and emotional response scale (Carver, 1997), it was noted that men showed less anxiety than women. Further, participants from the rural areas exhibited less anxiety and fear than participants from the urban settings. The prevalence of COVID-19 in the urban areas led to increased anxiety and anger among urban participants (Huang et al., 2020). For international students who lived alone, self-isolation negatively impacted their mental well-being (Brajkovic et al., 2020). In the higher education sector, the COVID-19 pandemic has brought about a number of mental health challenges to students resulting from the transfer of learning online. This increased anxiety as many students believed it would affect their academic performance and subsequent future employment (Chen & Lucock, 2022).

Adaptation of a Blend of Face-to-Face and Online Engagement of Students

Online learning entails an engaging learning method using the internet (OECD, 2020). Before the COVID-19 pandemic, online learning saw a gradual growth in enrollment in the twenty-first century when it increased from 30% to 50% between 2013 and 2018 (Kaplan & Haenlein, 2016). Since the onset of the pandemic, higher educational

institutions have had to embrace online learning to enable the engagement of students as well as the completion of the academic calendar. Research indicates that going fully online has its benefits and disadvantages. Some advantages include self-directed learning, decreased time spent in traffic (especially for students living in cities in developing countries), convenience and the capability to balance learning and domestic chores. Despite these benefits, online learning comes with its disadvantages including disruptions at home during class, internet bandwidth issues, inadequate technological skills, and lack of personal computers (Almahasees et. al., 2021; Zammit, 2021). In order to address some of these shortcomings, higher education institutions rolled out a blended form of teaching and learning where students will be engaged both face-to-face and online (Macharia, 2021; Tsevi, 2021). There has also been a renewed interest in classroom learning in the post-COVID-19 era, and a need for a blend of online learning and face-to-face engagement in some institutions. In some countries in Sub-Saharan Africa, students did not fully embrace online learning because of poor internet connectivity in the rural areas and lack of stable supply of electricity (Egielewa et. al., 2022). Other research recommended blended learning to replace online learning (Al-Fodeh et al., 2021; Almahasees et al., 2021; Paudel, 2021).

Expediting Higher Education Institutions' Digital Transformation

Higher education institutions' adoption of digitalization to aid the engagement, teaching and learning of students are challenged by the digital divide indicating knowledge inequalities in the society. It shows the gap between those who have access to ICT (information, communication and technology) and those who do not. The digital divide exists not only between developed and developing countries, but also between regions within the same country such as in Japan (Wong, 2002; Nishida et al., 2014).
Higher education institutions with the requisite ICT infrastructure will improve their education services delivery faster than those with poor ICT infrastructure. Therefore, the greater the digital divide, the wider the educational opportunity gaps. COVID-19 has accelerated digital transformation in the education sector (Zeleza & Okanda, 2021). Before the pandemic, digital transformation in the higher education sector happened at a slow pace in most institutions.

Revision of Academic Calendars of Many Higher Education Institutions

Globally, many higher education institutions had to revise their academic calendars. The academic calendar for Japan and other Asian countries for instance started in April. Now it begins in September because of the disruption of the COVID-19 pandemic (Ewing, 2021; Kang, 2021).

New Assessment Methods

As COVID-19 enabled online learning, faculty members had to devise rigorous ways of assessing students online since there was either limited or no face-to-face component because of the need for required social distancing. A study by Dhonncha and Murphy (2021) indicated innovative ways of online assessment for dermatology students in Irish

universities. The assessment methods included 30 multiple choice questions using the Canvas Learning Management System. Each question has a clinical image associated that students had to study to enable the answering of the questions within 30 minutes. The authors believed that the use of clinical images prevented the students from accessing information resources available to them in the home environment while taking the 30-minute assessment.

Conclusion

The COVID-19 pandemic has presented the education system with a renewed opportunity to embrace new technology and transition online. It has acted as a catalyst that has changed the outlook for online learning in the education sector generally and the higher education sector particularly by compelling institutions to adopt either the blended form of learning or go fully online. Higher education institutional leadership has had to develop the ability to be flexible and proactive in their response to the uncertain times during and after the peak of the pandemic. More attention must be focused on student mental health in the post-COVID era. In addition, regular digital training is required for faculty members, support staff and students to keep them abreast with technological innovations. This pandemic has had its advantages as well as disadvantages. Among the advantages include the ability of higher education institutions to leverage technological benefits to foster growth and expansion in their digitalization focus though there may be still issues about the digital divide among regions in the same country. One major disadvantage in Sub-Saharan African especially, is the extreme technological divide at all levels of the educational paradigm, higher educational sector included, which has greatly impacted the deployment of technological innovations. There is therefore the need for a collaborative partnership between the public and private higher education institutions particularly in the global south. Some private higher education institutions are struggling in terms of technological infrastructure and engaging students in online teaching and learning. This collaborative partnership will enable strategic capacity building for both the private and public higher education institutions.

References

African Union (2020). Communique of the Bureau of the specialized technical committee on education science and technology of the African Union, pp. 1–3.

Almahasees Z., Mohsen K., & Amin M. O. (2021). Faculty's and students' perceptions of online learning during COVID-19. *Frontiers in Education, 6*, 1–10. https://doi.org/10.3389/feduc.2021.638470

Al-Fodeh, R. S., Alwahadni, . M. S., Abu Alhaijia, E. S., Bani-Hani, T., Ali, K., Daher, S. O., & Daher, H, O. (2021). Quality, effectiveness and outcome of blended learning in dental education during the COVID pandemic: Prospects of a post-pandemic implementation. *Education Sciences, 11*(12), 810–810.

Ashour, S., El-Refae, G. A., & Zaitou E. A. (2021). Post-pandemic higher education: Perspectives from university leaders and educational experts in the United Arab Emirates. *Higher Education for the Future, 8*(2), 219–238.

Ates-Cobanoglu, A., & Cobanoglu, I. (2021). Do Turkish student teachers feel ready for online learning in Post-Covid Times? A study of online learning readiness. *Turkish Online Journal of Distance Education, 22*(3), 270–280.

Badat, S. (2020). Reproduction, transformation and public South African higher education during and beyond Covid-19. *Transformation: Critical Perspectives on Southern Africa, 104*, 24–42.

Brajkovic, L., Nikolaev, D., & Zavalina, P. (2020). Tertiary education and COVID-19: Impact and mitigation strategies in Europe and Central Asia. World Bank's Education Global Practice.

Carver, C. S. (1997). You want to measure coping but your protocol's too long: Consider the Brief COPE. *International Journal of Behavioral Medicine, 4*, 92–100.

Cao, W., Fang, Z., Hou, G.Han, M., Xu, X., Dong, J., & Zheng, J. (2020). The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry Research, 287*, 112934

Chen, T., & Lucock, M. (2022). The mental health of university students during the COVID-19 pandemic: An online survey in the UK. *PLoS ONE*, *17*(1): e0262562. https://doi.org/10.1371/journal.pone.02622562

Daniel, S. J., (2020). Education and the COVID-19 pandemic. *Prospects, 49*, 91–96, https://doi.org/10.1007/s11125-020-09464-3

DeVaney, J., Shimshon, G., Rascoff, M., & Maggioncalda, J. (2020, May). Higher Ed needs a long-term plan for virtual learning. *Harvard Business Review.* https://hbr.org/2020/05/higher-edneeds-a-long-term-plan-for-virtual-learning.

Dhonncha, E. N., & Murphy, M. (2021). Learning new ways of teaching and assessment: The impact of COVID-19 on undergraduate dermatology education. *Clinical and Experimental Dermatology, 46*, 170–171.

Egielewa, P., Idogho, P. O., Iyalomhe, F. O., & Cirella, G. T. (2022). COVID-19 and digitized education: Analysis of online learning in Nigerian higher education: *E-Learning and Digital Media, 19*(1), 19–35.

Ewing, L. (2021). Rethinking higher education post COVID-19. In J. Lee, & S.H. Han (Eds.), *The ICT and evolution of work: The future of service post-COVID-19 pandemic,* (Vol. 1, pp. 37–54). Springer.

Holmes, E. A., O'Connor, R. C., Perry, V. H., Tracey, I., Wessely, S., Arsenault, L., … Bullmore, E. (2020). Multidisciplinary research priorities for the COVID-19 pandemic: A call for action for mental health science. *The Lancet Psychiatry, 7*(6), 547–560.

Huang, L., Lei, W., Xu, F., Liu, H., & Yu, L. (2020). Emotional responses and coping strategies in nurses and nursing students during Covid-19 outbreak: A comparative study. *PLOS ONE*;15, e0237303. https://doi.org/10.1371/journal.pone.0237303

Lola, N., Rano, A, Munira, U., Nozima,S., & Roziya, U. (2021). Basics of online teaching, usage and implementation process in the period of COVID 19. *Annals of Romanian Society for Cell Biology, 25*(1), 6457–6463.

Iansiti, M., & Richards, G. (2020). *Coronavirus is widening the corporate digital divide. Harvard Business Review*. Retrieved June, 2022, from https://hbr.org/2020/03/coronavirus-iswidening-the-corporate-digital-divide

Kajita, R. M., Nomngcoyiya, T., &Kang'ethe, S. M. (2020). The 'revolution' on teaching and learning: Implications of Covid-19 on social work education in institutions of higher learning in Africa. *African Journal of Social Work, 10*(3), 25–33.

Kang, B. (2021). How the COVID-19 pandemic is reshaping the education service. In J. Lee, J. & S.H. Han. (Eds.) *The ICT and evolution of work: the future of service post-COVID-19 pandemic*, (Vol. 1, pp. 15–36). Springer.

Kaplan, A. M., & Haenlein, M. (2016). Higher education and the digital revolution: About MOOCs, SPOCs, social media, and the Cookie Monster. *Business Horizons, 59*(4), 441–50.

Kaparounaki C. K., Patsali, M. E., Mousa, D. V., Papadopoulou, E. V. K., Papadopoulou, K. K. K., & Fountoulakis, K. N. (2020). University students' mental health amidst the COVID-19 quarantine in Greece. *Psychiatry Research, 290*, 113111.

Kitchenham, B., & Charters, S. (2007). *Guidelines for performing systematic literature reviews in software engineering*. Retrieved from https://userpages.uni-koblenz.de/~laemmel/esecourse/slides/slr.pdf

Macharia, J. K. N. (2021). The factors affecting the adoption of virtual learning environments (VLE) and learner management systems (LMS) by higher education students during and post-COVID-19 in Kenya. *Journal of Language, Technology & Entrepreneurship in Africa, 12*(2), 187–207.

Moghli, M., A., & Shuayb, M. (2020). Education under COVID-19 lockdown: Reflections from teachers, students & parents. Centre for Lebanese Studies.

Nawangwe, B. (2021). Re-thinking African higher education in the post-Covid-19 era. *In Higher Education's Response to the COVID-19 Pandemic: Building a More Sustainable and Democratic Future*, Council of Europe Higher Education Series, No. 25.

Nishida, T., Pick, J. B., & Sarkar, A. (2014). Japan's prefectural digital divide: A multivariate and spatial analysis. *Telecommunications Policy, 38*(11), 992–1010.

OECD. (2020). *The potential of online learning for adults: Early lessons from the COVID-19 crisis*. https://www.oecd.org/coronavirus/policy-responses/the-potential-of-online-learning-for-adults-earlylessons-from-the-covid-19-crisis-ee040002/.

Paudel, P. (2021). Online education: Benefits, challenges and strategies during and after COVID-19 in higher education. *International Journal on Studies in Education, 3*(2); 70–85.

Pragholapati, A. (2020). COVID-19 impact on students, pp. 1–6. https://edarxiv.org/895ed https://doi.org/10.17605/OSF.IO/NUYJ9

Tsevi, L. (2021). COVID-19 and higher education in Ghana: The case a public higher education institution. *International Journal of Multidisciplinary Perspectives in Higher Education*, *6*(1), 150–155.

United Nations. (2020). *Policy brief: Education during COVID-19 and beyond*.

Zammit, J. (2021). Adult learners' perceptions on online learning. *Asian Journal of Social Science and Management Technology, 3*(2), 84–100.

Zeleza, P. T., & Okanda, P. M. (2021). Enhancing the digital transformation of African universities: Covid-19 as accelerator. *Journal of Higher Education in Africa/ Revue de l'enseignement supérieur en Afrique, 19*(1), 1–28.

Zinyemba, L., Nhongo K., & Zinyemba, A. (2021). COVID-19 induced online learning: the Zimbabwean experience. *African Journal of Social Work, 11*(4), 223–230.

Zhong, X., Liu, X., Liu, X., Liu, J., & Zhong, X. (2020). Psychological state of college students during COVID-19 outbreak**.** *The Lancet Global Health*. Available at SSRN: https://ssrn.com/abstract=3552814 or http://dx.doi.org/10.2139/ssrn.3552814