

PART II

MENA REGION, AFRICA
AND EUROPE

CHAPTER 6

UNIVERSITY PREPAREDNESS FOR ONLINE TEACHING AND LEARNING AMID COVID-19 IN KENYA

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ABSTRACT

Globally, the COVID-19 pandemic took institutions of learning and the work-places by surprise. Offering online learning was an alternative for institutions of higher learning. Were the Kenyan institutions adequately prepared for this? The present study had three specific objectives: (a) to establish the status of policy preparedness of online teaching and learning in Kenyan universities; (b) to explore the infrastructural preparedness of the universities; and (c) to find out the level of competency preparedness of lecturers and students in embracing the facilities for online teaching and learning. The study had an embedded mixed method research design. Data were gathered using an online questionnaire, from 112 lecturers and 372 students, who were conveniently sampled, representing 34 universities and university colleges. Findings suggest that almost all represented institutions have a policy on online teaching and learning, though 50% of participants' report that the policy did not exist prior to the onset of COVID-19. On the level of infrastructural preparedness, the personal ownership of digital devices among participants is very impressive, though 50% of institutions do not provide any device. Thirdly, the level of competency in the use of the three sets of online platforms for teaching and learning is far below the expected average, but this is improving since the onset of

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COVID-19. Lecturers have statistically more perceived competence than students ($p < 0.01$). The implication of these results is discussed. And we conclude that the period of forced online teaching and learning need not be considered as a stop-gap measure during COVID-19, but as a way forward for improved self-learning and lifelong learning.

INTRODUCTION

The first case of COVID-19 infection was reported in Kenya on March 13, 2020. To curb the spread of the disease, stringent measures, which included lockdowns and social distancing, were to be implemented. An order was also issued by the government to shut down all learning institutions. Kenya's learners became part of the 1.6 billion learners in more than 190 countries whose academic calendar was disrupted by the pandemic (De Giusti, 2020). For most institutions of higher learning in Kenya, this was well into the second semester of the academic year. Institutions had to strategize on how to conclude the remaining part of the semester, and to continue with teaching and learning in the subsequent semesters. The continuation of operations also had crucial impact on the financial and human resources stability of the institutions.

Offering online learning was the alternative mode for the universities to keep the operations going. As Martinez (2020) observes, the rapid spread of the virus left institutions of higher learning with no option but to adopt new methodologies in teaching and learning. In this case online teaching was the only option. In Kenya, some universities that offered online or blended courses handled the transition better. There were other universities, mostly private ones, that had already integrated learning management systems (LMS) to their normal teaching and learning, to offer an experience of a flipped classroom (Gilboy, Heinerichs, & Pazzaglia, 2015) to their learners. These might have handled the transition with even more ease. What was the general situation across Kenyan educational institutions?

In order to ensure minimal interruption to learning, the Government of Kenya (2020) developed and implemented the "Kenya Basic Education COVID-19 Emergency Response Plan." The plan targeted school-level learning. It encouraged institutions to provide online learning material, and to offer professional development and psychosocial support to teachers and learner. However, as Moyi (2020) points out, this plan received very skeptical response from stakeholders in the education sector. Was the skeptical response on account of the lack of previous preparedness of educational institutions for such a task? This situation refers to primary and secondary schools, but what about tertiary level institutions?

The Commission for University Education in Kenya elicited a report from public and private universities describing the specific steps that they had taken to enable continuity of learning. In the report, the universities were required to provide details of courses that were being offered, the platforms that were being used to deliver the courses, and the level of accessibility of students, among

other elements. It is likely that there was a smooth transition and continuation of remote teaching and learning for institutions which had systems in place either before the onset of COVID-19, or at least during it. But this may not have been the case for some of the universities. Generally, amid the online teaching and learning option, universities were left to deal with challenges such as absence of policy on online teaching and learning, inadequate information and communications technology (ICT) infrastructure, and lack of competency preparedness of faculty and students in the use of online platforms. Economic disparity and lack of digital literacy among students and faculty compounded the imminent challenges. The manifestation of these challenges has raised the question of the overall preparedness of Kenyan universities in the integration of online facilities for remote or blended learning. The study being reported here was carried out to assess the preparedness of universities and university colleges in Kenya in delivering online teaching and learning amid COVID-19.

According to the World Bank, as of 2019, 22.6% of the population of Kenya had access to the internet. However, as of January 2021, this number has risen to 40% (Kemp, 2021). Corresponding to the national uptake, the institutions of higher education have been investing on digital infrastructural development since the early 2000s (Macharia & Nyakwende, 2009). This may not be proportionately reflected in the development of competency and the actual use of internet for education among lecturers and students. Previous studies (Kamonde, 2003; Waithaka, 2013) suggest that university students in Kenya generally have a good level of competency in the basic use of computer and internet. However, they tend to use them more for entertainment and social interaction as compared to research and self-learning because they lack advanced skills. This could be attributed to the lack of training in digital information skills to both lecturers and students. Have the disruptions caused by COVID-19 in face-to-face teaching and learning made any difference in the use of internet for higher education? That is the subject of our study.

For purposes of this study, we define “online teaching and learning” as a process in which lecturers and students interact with the course content and communicate with each other using internet-based online technologies (Curran, 2008). Generally, if over 80% of the course content is offered via internet, then the course is considered to be online (Simonson, Zvacek, & Smaldino, 2019). We consistently focus on “teaching and learning” as two distinct but not always as separate entities. Learning can take place independent of teaching. In fact, teaching should be seen only as a tentative scaffolding process (Vygotsky, 1987). However, as long as someone is registered as a student in an educational institution, it is only relevant to talk about “teaching and learning” as co-existing. Within this context, with the advent of LMS independent learning has been highly facilitated.

On another plane, some studies have pointed out the difficulty in breaking down variables related to integration of ICT in education (Tondeur, Van Keer, Van Braak, & Valcke, 2008). However, based on literature, in this study, we operationalized “the preparedness of universities for online teaching and learning” in terms of three examinable dimensions as listed below.

- (a) Presence of online teaching and learning policy at the institution, and the level of awareness of the same among lecturers and students. We were particularly interested in knowing if the policy existed before COVID-19 and if the educative community, which, for the purposes of this study includes lecturers and students, was aware of the existence of the policy and its dimensions. According to Kennewell, Parkinson, and Tanner (2002), presence of policies at the school level could, to a large extent, reflect the dynamics in the actual teaching and learning. If the teachers are able to share the values captured in the policy, then it is likely that they are making an effort to practice it (see also Tondeur et al., 2008).

Based on literature (Holt & Challis, 2007; Wallace, 2007; Waterhouse, 2004), we focused on the following components of online teaching and learning policy: modes of instruction, curricular control, intellectual property, enrollment and attendance, academic integrity, evaluations and assessments, faculty support, and student support.

- (b) The presence of ICT infrastructure and the level of accessibility of the same to lecturers and students could be another indicator of the preparedness for online teaching and learning.

We operationalized general variable of “the presence of ICT infrastructure,” in terms of the following elements: the device that lecturers and students own, the device that they most use, the device that lecturers and students are offered to use or to own from their institution of teaching and learning, and the accessibility to internet.

- (c) Finally, “the computer experience” (Williams, Coles, Wilson, Richardson, & Tuson, 2000) in terms of the conversancy in the use of the standard platforms for online teaching and learning among lecturers and learners could be another indicator of preparedness for online teaching and learning. Again here, we intended to know how much of familiarity was gathered during COVID-19. Furthermore, for purposes of the present study, online teaching and learning platforms are grouped into three categories:

- (i) *LMS*: These include those software platforms that facilitate communication between the lecturer and the learners in sharing learning resources, posting, and submission of announcements and assessments, grading, and plagiarism check, among other related functions. In this category fall online platforms such as Moodle, Google Classroom, BlackBoard, Canvas, and M-Elimu – which is a local platform.
- (ii) *Participation facilitation technology*: These are online tools that facilitate participatory teaching and learning. These web-based tools comprise those used to elicit participation of learners during face-to-face or online sessions. These include Menti, Socrative, Kahoot.it, PollEveryWhere, NearPod, and the like.
- (iii) *Remote video conferencing*: These refer to online facilities that provide possibility for videotelephony and chat services. Under this category fall services such as Zoom, Google Meet, Microsoft Teams, Cisco Webex, etc.

Against the above parameters, the present study aimed to examine the level of preparedness of Kenyan universities in offering online education during

restrictions necessitated by COVID-19. More specifically, the study focused on the following research objectives:

1. To establish the status of policy preparedness of online teaching and learning in Kenyan universities.
2. To explore the infrastructural preparedness in Kenyan universities in order to adopt online teaching and learning.
3. To find out the level of competency preparedness of lecturers and students in Kenyan universities in embracing the facilities for online teaching and learning.

METHOD OF STUDY

Study design

The study had an embedded mixed method research design, largely using quantitative data and a little qualitative data. On the one hand, the qualitative data were used to provide a supportive but secondary role to the quantitative data (Creswell & Clark, 2017). The quantitative design played an important role because the study was meant to be a survey of the situation involving a relatively large sample. The quantitative data helped in arriving at some significant conclusions, and to test interaction between different variables. On the other hand, qualitative data helped in describing the interaction of the numbers. It gave voice to the perception and experience of the participants (Selvam, 2017) in handling the transition in teaching and learning during COVID-19.

Participants of the Study

There are 74 accredited universities and university colleges in Kenya, of these 38 of them are public (51.5%) and 36 are private (48.5%). At least 34 universities and university colleges were represented in the data of the study being reported here, amounting to about 46% of the total number of approved universities and university colleges. The data were not collected from certificate and diploma colleges. As for the sampling of lecturers and students from within these institutions, convenience sampling had to be used due to the pressure of time and the restriction of movements during COVID-19. In the present data gathered from a total 484 participants, 23% were lecturers and 77% were students, as shown in Table 1. Of this, 22% of the participants claimed to be hailing from public universities or campuses, about 77% claimed to be at a private university or college, others were not sure of the ownership of their institution. A higher number of participants in the study came from private universities probably because the public universities were less accessible to the online questionnaire.

As regards the gender of the participants, including lecturers and students, nearly 60% were female. The mean age of the lecturers was 43.49 (SD=11.16), and mean age of students was 34.55 (SD=10.18). In the whole sample, the youngest participant was 18, and the oldest person was 67 years old. The average age of students being higher than expected could indicate that a lot of older people

Table 1. Description of Participants.

	Ownership of Institution ^a		Gender ^a		Total
	Private	Public	Male	Female	
Lecturers	73	39	57	54	112 (23%)
Students	300	63	133	235	372 (77%)
Total	373	102	190	289	484 (100%)

^aTotal in the categories does not tally, because nine participants were not sure of the ownership of their institution, and five participants did not declare their gender.

are returning to higher education in Kenya, and since our survey was conducted online older students might have had better access to devices and internet. As for their educational level, as it could be assumed in the Kenyan context, 50% of lecturers had completed master's degrees and others were PhD holders; however, among student participants, majority of them (74%) were undergraduates.

Data Collection

The quantitative data were collected using an online questionnaire. There were two different versions of the questionnaire for lecturers and students. The two versions examined the same variables, with the difference only in the phrasing of the items. Hence, the data from the two versions could be comparable, and at times totaled up, for analysis. The questionnaire had four sections. The first section focused on some demographic details about the participants and their institutions. The second section pertained to the presence and awareness of the institutional policy on online teaching and learning. The third section had items regarding the situation of ICT infrastructure in the learning institutions. And finally, the fourth part explored the experience and competencies of the lecturers and students in their use of the three categories of online teaching and learning platforms. We also included an open-ended question for the participants to express anything not foreseen in the questionnaire. This was the only item eliciting qualitative data. The question itself was phrased thus: "Add any other comment about how COVID-19 has affected your teaching and/or learning."

Data Analysis

Quantitative data were analyzed using descriptive and inferential statistics. While descriptive statistics was used to present summaries of data collected, inferential statistics was used to establish if the interaction between variables was statistically significant, particularly examining the difference between lecturers and students in their quantified perception and experience of the dimensions of preparedness of universities for online teaching and learning. The data collected from the qualitative item amounted to nearly 8,000 words (16 pages). Content analysis was carried out to pick up the patterns in qualitative data emerging from the single open-ended item. They were grouped according to their relevance to the three objectives of the study and reported accordingly.

Ethical Considerations

As per standard practices in Kenya, the research project was first approved by the Research Committee of the affiliate institution of the authors, and then it was officially approved by one of the accredited Institutional Ethics Review Committees in Kenya, and finally the permit to collect data was obtained from the National Commission for Science, Technology, and Innovation. Data were collected from those who had completed 18 years of age. And the participants were required to tick an item expressing their informed consent before the online platform opened up the rest of the questionnaire for them to respond to. The participation in the study was voluntary. No individual details of students, lecturers, or universities are mentioned in the report, all conclusions of the study are based on the summary of the data.

FINDINGS

The findings of the study are reported here in three sections corresponding to the three specific objectives of the study. For each section, we present the findings emerging from the quantitative data and add a few additional expressions from participants' reply to the single open-ended question, if the replies add support and further explanation to the quantitative data (Creswell & Clark, 2017).

Policy Preparedness for Online Teaching and Learning

The existence of an institutional online teaching and learning policy is seen as one of the indicators of the preparedness of the institution (Kennewell et al., 2002). Moreover, the awareness of members of the institution about its existence and contents could be an additional indication. Therefore, one of the items in the questionnaire asked participants if in their knowledge a policy existed in their respective institution. An overwhelming 88.8% of all lecturers and students in the study answered it in the affirmative (Table 2). However, when asked if the policy existed before the onset of COVID-19, only 41.5% offer an affirmative answer, and over 15% of them are not sure. The difference the perceived existence of the policy before and after COVID-19 was confirmed to be statistically significant by the results emerging from McNemar–Boker test, $\chi^2 = 224.831$, $p < 0.001$. This suggests one of two possible scenarios: (a) that institutions had to work on an online teaching and learning policy in response to the need necessitated by COVID-19, or (b) that the lecturers and students were just not aware of its existence prior to COVID-19. In any case, 65.5% of the participants of the study claim that they have been trained in the contents of the policy. It could be assumed that this took place in the context of COVID-19 given the difference in the awareness of the existence of the policy before and after COVID-19.

Comparing private and public universities in their policy preparedness, there was no significant difference between them in terms of policy existence, $F(1)=2.566$, $p=0.078$, and in terms of policy training, $F(1)=1.771$, $p=0.171$.

Table 2. Difference between Opinion of Lecturers and Students on Policy.^a

		Lecturer (%) (n1 = 112)	Students (%) (n2 = 372)	χ^2 (df = 2), <i>p</i>
Policy existence	Yes	92.0	87.9	1.480, <i>p</i> = 0.477
	No	4.5	7.3	
	Not Sure	3.6	4.8	
Policy before COVID-19	Yes	47.3	39.8	2.394, <i>p</i> = 0.302
	No	36.6	44.4	
	Not Sure	16.1	15.9	
Training on policy	Yes	75.0	62.6	11.968, <i>p</i> = 0.003
	No	17.9	33.9	
	Not Sure	7.1	3.5	

^a % within category of lecturers and students separately considered.

Comparing the opinion of lecturers and students on policy on online teaching and learning, as Table 2 suggests, teachers seem to be better informed about the existence of the policy and better trained on it. Going by the descriptive data, across three elements, the lecturers offer a more optimistic answer as compared to the students. However, this difference is statistically significant only in the training dimension as confirmed by a chi-square test, $\chi^2(2) = 11.968, p=0.003$. More lecturers as compared to the students acknowledge that they have been trained on the policy.

As regards the contents of the policy (Fig. 1), the most remembered element by lecturers and students is the dimension of evaluations and assessments. This is followed by enrollment and attendance, and modes of instruction. Issues regarding curricular control and intellectual property are the least scored. On the part of the students, the most recalled element is enrollment and attendance. This could be due to selective memory of the participants according to relevance of the elements for them. These elements also show that the participants are more focused on the practical dimensions of the policy than the theoretical dimension. The qualitative data add further support of this finding. Most students voiced the difficulty they encountered in end-of-term assessments that were held online. Since this was their first experience of writing exams online, they became overly anxious. And because the policy had not overseen all the possible snags that could occur such as inconsistent access to internet connectivity and collapsed server systems, the students felt that the “educational institutions were making the path as they walked.”

Finally, one item in the questionnaire assessed the level of satisfaction on the online teaching and learning policy. The item was scored on a 5-point Likert scale with scores ranging from 0 to 4. Table 3 presents the findings from this item, comparing the results of lecturers and students with the test for statistical significance using an independent samples Mann Whitney *U* test. The mean scores show that lecturers are more satisfied with the policy as compared to the students, this difference is statistically significant, $U = 17,089.50, p = 0.003$.

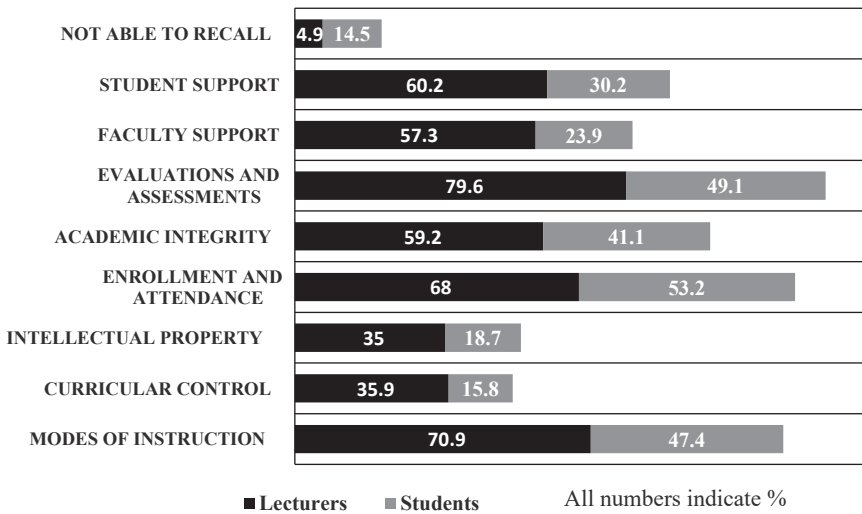


Fig. 1. Contents of Policy.

Infrastructural Preparedness in Adopting Online Teaching and Learning

The second objective of the study aimed at exploring the infrastructural preparedness in Kenyan universities in order to adopt online teaching and learning amid COVID-19. As said earlier, ICT preparedness was broken down in terms of the following variables: the device that lecturers and students own, the device that they most use, the device that lecturers and students are offered to use or to own from their institution of teaching and learning, and the accessibility to internet.

Regarding ownership of devices, as shown in Fig. 2, consistently lecturers own more devices than the students. This is not a surprise as lecturers have more access to resources. The most owned device is the laptop, and this is followed by smart phones. Only about 1% of the students do not own any of the devices, they might access a desktop provided by the institution of learning or might be sharing devices with someone else. Taken together, almost every participant in the study has access to at least one of the devices. However, a caveat is in place here: since the questionnaire for the study was online it is possible that those who do not own any device got naturally eliminated from the study. Therefore, these data only offer us an indicative trend and cannot be used to generalize for the whole country.

Table 3. Level of Satisfaction Regarding Policy and Internet Accessibility.

	Lecturers (Mean, SD)	Students (Mean, SD)	U, p
Satisfaction on online teaching and learning policy	2.73 (1.04)	2.34 (1.15)	U = 17,089.50, p = 0.003
Satisfaction on internet accessibility	3.53 (1.23)	3.11 (1.10)	U = 16,386.50, p < 0.001

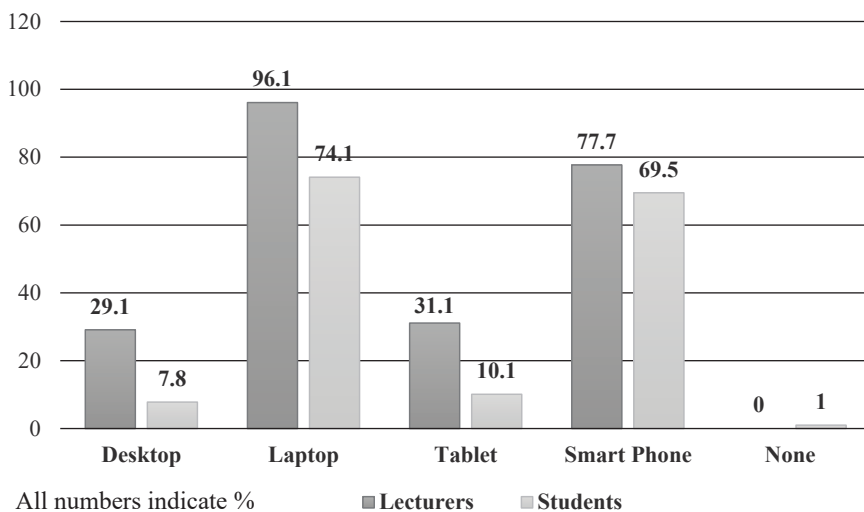


Fig. 2. Ownership of Devices.

Going beyond ownership to the *use* of the devices, there were some interesting findings. Among the use of the top two owned devices, students tend to use smart phones (65.5%) more than the laptops (60.1%), whereas lecturers tend to use laptops (84.5%) more than smart phones (63.1%). Across the categories of participants, the Tablet (such as I-Pad or Samsung Tab) is the least used device.

What devices are provided by the institution for use of the lecturers and students? The most accessible device is desktop and the least provided for use is smart phone (see Fig. 3). Again here, lecturers are better privileged than students. About 8.5% students and 3.5% of lecturers also claim that the device that they possess was given by the institution at a subsidized cost or purely as a gift. In this case, the students seem to be better privileged than the lecturers. The most surprising finding here, suggesting a low level of infrastructural preparedness for online teaching and learning, is that almost 50% of the participants (both lecturers and students) claim that the institution provides no device at all.

Finally, one item in the questionnaire assessed the level of satisfaction about internet accessibility in the campus. The item was scored on a 5-point Likert scale with scores ranging from 1 to 5, where 1 indicated “very low-quality connectivity” and 5 indicated “very high-quality connectivity.” Table 3 presents the findings from that item, comparing the results of lecturers and students with the test for statistical significance using an independent samples *t*-test. The mean scores show that lecturers are more satisfied with internet connectivity as compared to the students, this difference is again statistically significant, $U=16,386.50$, $p<0.001$. This situation was further explained by the qualitative data. Over 80% of the students profusely complained about the lack of

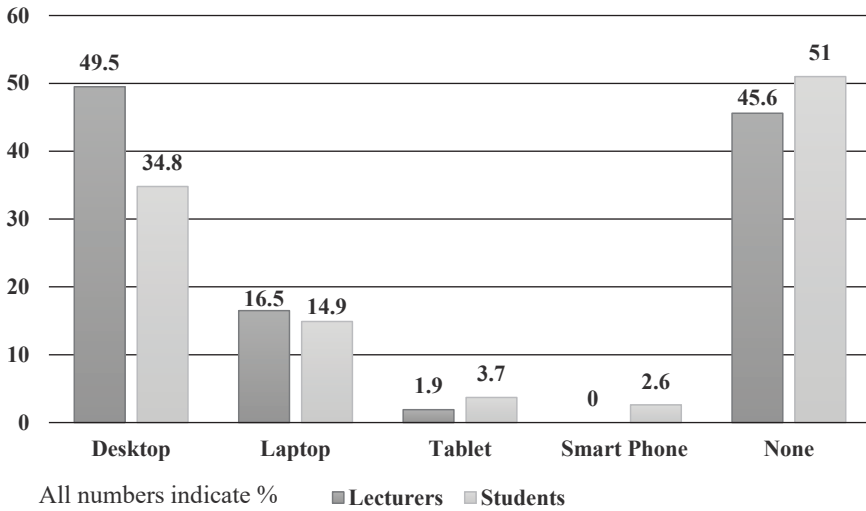


Fig. 3. Devices Provided for Use by the Learning Institutions.

consistent internet accessibility particularly in rural Kenya. The cost of buying internet data bundles was also not budgeted for many students. This made them not only miss classes or assessments, but also increased their anxiety levels challenging their learning process.

Level of Competency Preparedness of Lecturers and Students

The third objective of the study sought to explore levels of competency preparedness of lecturers and students in Kenyan universities in embracing online teaching and learning. More precisely, we examined their level of competency across three groups of online facilities: LMS, participation facilitation technology, and teleconferencing platforms.

Two aspects stand out when all participants’ (lecturers and students) perceived level of competency preparedness was examined (Table 4). One, their level of mean scores before COVID-19 fall below the expected mean of 2.5. Two, there is a statistically significant improvement in the scores of perceived competencies across the three groupings of online platforms during COVID-19. This improvement could have happened as a result of just jumping into the task and learning by doing, or they underwent some form of training. When statistical significance was established by carrying out a paired-samples *t*-test, comparing the scores of before and during COVID-19, only in familiarity in the use of teleconferencing platforms their perceived competency had gone above the expected mean score. This is also the grouping that included the use of Zoom, or Google Meet, or Microsoft Teams that received highest scores. This is understandable given that the teleconferencing platform became indispensable

Table 4. Level of Competency in the Use of Online Platforms for All.

	Before COVID-19 <i>Mean (SD)</i>	During COVID-19 <i>Mean (SD)</i>	<i>t(df), p</i>
Familiarity with use of LMS	1.73 (1.53)	2.09 (1.64)	$t(410) = -6.452, p < 0.001$
Familiarity with use of facilitation technology	0.79 (1.24)	0.98 (1.35)	$t(379) = -4.212, p < 0.001$
Familiarity with use of teleconferencing	2.31 (1.60)	2.82 (1.54)	$t(427) = -8.007, p < 0.001$

Range of scoring: 0–5 and expected mean = 2.5.

for online teaching and learning, while the other two groups were important but not necessary platforms.

We compared the perceived competency levels of lecturers against that of the students, before and during COVID-19. As Table 5 indicates, lecturers scored more optimistic levels across the three groupings of technologies both before and during COVID-19. However, in the qualitative data, we found a number of students complaining about the lack of competency among lecturers that often disrupted or at times terminated particular sessions of online teaching.

We further explored if there would be any gender difference on their level of competency, and any correlation between age and competency preparedness for online teaching and learning. We assumed that younger participants may be more conversant with the online platforms. That is, there could be a negative correlation between age and level of competency preparedness in the use of LMS, participation facilitation technology, and teleconferencing platforms, before or during COVID-19. Pearson's test for correlation showed no significant level of correlation between any pair of variables against age. On the contrary, when we ran a one-way ANOVA using gender as the factor variable and the three groups of online platforms as dependent variables, some significant differences were noticed (see Table 6). Going by the mean scores alone female participants consistently scored lower than the other two gender groupings, except in the score

Table 5. Level of Competency – Comparison of Lecturers and Students.

	Lecturers <i>(Mean, SD)</i>	Students <i>(Mean, SD)</i>	<i>t(df), p</i>
Familiarity with LMS before COVID-19	2.24 (1.67)	1.53 (1.42)	$t(434) = 4.301, p < 0.001$
Familiarity with facilitation technology before COVID-19	1.03 (1.42)	0.68 (1.14)	$t(400) = 2.468, p = 0.014$
Familiarity with teleconferencing before COVID-19	2.75 (1.65)	2.11 (1.56)	$t(450) = 3.750, p < 0.001$
Familiarity with LMS during COVID-19	2.80 (1.71)	1.86 (1.57)	$t(419) = 5.161, p < 0.001$
Familiarity with facilitation technology during COVID-19	1.39 (1.57)	0.86 (1.24)	$t(384) = 3.364, p = 0.001$
Familiarity with teleconferencing during COVID-19	3.60 (1.57)	2.60 (1.54)	$t(439) = 5.832, p < 0.001$

Table 6. Gender Difference on Competency Preparedness.

	Male <i>Mean (SD)</i>	Female <i>Mean (SD)</i>	Gender N/A <i>Mean (SD)</i>	<i>F(df), p</i>
Familiarity with LMS before COVID-19	1.93 (1.46)	1.56 (1.53)	2.00 (1.00)	$F(2) = 3.251, p = 0.040$
Familiarity with facilitation technology before COVID-19	0.68 (1.07)	0.81 (1.31)	1.67 (1.53)	$F(2) = 1.355, p = 0.259$
Familiarity with teleconferencing platforms before COVID-19	2.49 (1.66)	2.10 (1.55)	2.60 (1.53)	$F(2) = 3.278, p = 0.039$
Familiarity with LMS after COVID-19	2.29 (1.67)	1.91 (1.60)	3.67 (1.53)	$F(2) = 4.099, p = 0.017$
Familiarity with facilitation technology before COVID-19	1.02 (1.38)	0.94 (1.30)	2.33 (2.52)	$F(2) = 1.681, p = 0.187$
Familiarity with teleconferencing platforms before COVID-19	2.91 (1.59)	2.76 (1.54)	3.40 (1.82)	$F(2) = 0.870, p = 0.420$

Range of scoring: 0–5 and expected mean = 2.5.

of familiarity with facilitation technology prior to COVID-19. The gender differences were statistically significant in the use of LMS before and during COVID-19, and familiarity with teleconferencing before COVID-19.

DISCUSSION

The present study set out with three objectives. In this section, we state each of these objectives and present the salient results emerging from the data and discuss the findings in the light of literature.

The first objective was to establish the status of policy preparedness of online teaching and learning in Kenyan universities. Almost all participants claim that a policy on online teaching and learning does exist in their institution. However, less than half of the participants, including lecturers and students, report that the policy did not exist prior to the onset of COVID-19. Thirdly, comparing the opinion of lecturers and students on online teaching and learning policy, as Table 2 suggests, teachers seem to be consistently optimistic and better informed about the existence of the policy and its components. The lecturers also claim to be better trained on the policy, and this difference is statistically significant. The level of satisfaction (Table 3) among participants as regards the online teaching and learning policy is above average, though again teachers are better satisfied than the students at statistically significant levels. As regards the components of the policy, we noted that the participants in the present study focus on the practical aspects of the policy. Wallace (2007) points out that there should be equal focus on issues around academic integrity, code of conduct, intellectual property, privacy issues, and lecturers' responsibilities. Another aspect that should feature in the policy is instructional strategies, because those learning activities and strategies that are used in face-to-face teaching cannot be used online. Online teaching requires another set of activities and strategies. This again calls for professional

development of lecturers and student trainings on the specific components of policy (Kebritchi, Lipschuetz, & Santiago, 2017).

The second objective was to explore the infrastructural preparedness in Kenyan universities in order to adopt online teaching and learning. The ownership of digital devices among lecturers and students is very impressive, since only a very negligible number (1% of students) do not own any of the digital devices. However, almost 50% of the participants claim that their institutions do not provide access to any digital device. The level of satisfaction (Table 3) among participants as regards access to internet is very high, though the teachers are better satisfied than the students at statistically significant levels.

In the qualitative data, most of the students have expressed practical difficulties in logging on to the online sessions due to inconsistent internet connection, power-outage, remoteness of location, and the cost of buying internet bundles. Similar findings have been reported by Dube (2020) in the South African context, namely, online teaching excludes many rural learners due to lack of resources to connect to internet. Dube (2020) goes on to argue that the rural learners are critical stakeholders even in the fight against COVID-19 in the rural areas, and they should not be left behind.

The third objective was to find out the level of competency preparedness of lecturers and students in Kenyan universities in embracing the facilities for online teaching and learning. Generally, the level of competency in the use of the three sets of online platforms for teaching and learning is far below the expected average. However, across all these three categories there is statistically significant growth in the perceived level of competency between the situation before and after the onset of COVID-19 (Table 3). Particularly in the use of teleconferencing technology, the competency levels went up beyond the expected average.

Given this improving situation in Kenya, we acclaim with Kamal et al. (2020) who state in reference to the situation of Malaysia, that online learning need not be a hindrance, but a blessing toward improved self-learning and lifelong learning even beyond COVID-19. As one female lecturer put it in our qualitative data, "Notwithstanding the negative effects of COVID-19, I have definitely become better at online searching, learning and teaching." Another postgraduate's student states,

It has broadened my knowledge on how vast and rich the internet is and how when utilized properly can change one's life. Everything is condensed together. Online study is possible.

On the flip side, many of the participants expressed difficulties in carrying out practicum, for instance, in counseling, and the lack of access to laboratory for science subjects. This surely needs some face-to-face contact hours. Also, most participants miss the physical, social interactions that is part of face-to-face classroom sessions. In this light, blended learning is likely to be the new normal, rather than 100% online learning. The mixed sentiments expressed by the participants in the present study are similar to those voiced in studies from elsewhere in the world. For instance, a study from the Sultanate of Oman (Slimi, 2020) points out that majority of the participants in that study claimed to have developed independent learning skills, problem solving skills, and competency in ICT-based

communication as a result of online teaching and learning during COVID-19 restrictions. It is also consoling to note that even in countries such as Oman there were challenges related to internet connectivity.

Another finding related to the third objective was the gender parity in competency preparedness. This is a great surprise emerging out of the present study. This situation raises several questions: is this on account of the lack of opportunities for the female lecturers and students, or is it their lack of interest and “aggressiveness” to make use of the opportunities, or is it their other commitments in the household especially if they carry out online learning and teaching from within the home, or is it something else? There is ample literature that discusses the gender dynamics in online learning (for instance, Anderson & Haddad, 2005; Kramarae, 2001; Latchem, 2014; Latchem, 2014). Literature presents a mixed picture of the situation of women in online teaching and learning. On the one hand, women especially from traditional societies find the online learning environment less intimidating due to reduced social, gender-based competition, hence they often perform better than men in online learning (Gunn, McSpornan, Macleod, & French, 2003). On the other hand, different domestic arrangements of space and time in being available online could influence their access to learning (Burke, 2001). A report by World Bank (2011) also confirmed that many women are not able to benefit from online opportunities because of lack of resources and basic technical skills that will enable their access to internet. Hence, they are also not able to participate equally in knowledge economy. This calls for an affirmative action on the part of educational institutions in collaboration with governments in engendering online teaching and learning.

CONCLUSION

In conclusion, in line with the findings of the study we provide some recommendation to educational institutions, government of Kenya, and to lecturers and students. We also offer a brief proposal for future research. Though these recommendations are within the context of Kenya, they are generalizable to any similar situation. Finally, while acknowledging some of the limitations of the study we also recognize the valuable contribution of this study.

Some clearly emerging conclusions from the present study include lack of sufficient effort on the part of the institutions of higher learning to provide the infrastructural support to the lecturers and students. Almost 50% of the participants claim that the institutions do not provide access to any digital device. Similarly, competency preparedness across the three sets of online platforms falls below the expected average. These situations throw a challenge to the institutions to be proactive in investing on infrastructure and training. Online teaching and learning are not just a stop-gap measure to deal with the restrictions arising from COVID-19, blended learning is the future of education (Bonk, Kim, & Zeng, 2005).

No one was prepared for the enormity of the COVID-19 pandemic in every detail, nor were the institutions of higher learning. The restrictions necessitated by the pandemic put enormous budgetary pressure on the institutions. While the

Government of Kenya, as most governments, pumped in extra-financial resources to save the jobs and to keep the economy going, only a little resource were offered to schools and public universities. Private institutions had to bear the brunt on their own. Therefore, it is not fair to expect them to put all the required measures in place to offer online teaching and learning. Given that online learning will be the norm of the future, the government should have played a greater role. At the least, Government of Kenya and governments elsewhere need to invest heavily on providing universal internet connectivity. After all, as UN (2020) recommends right to education today includes right to internet connectivity.

In the qualitative data, several lectures and students expressed the positive outcomes of the experience of the teaching and learning during COVID-19. Individual lecturers and students need to continue their optimistic perception of the possibilities that online teaching and learning offers. They need to familiarize themselves with the new environment. Even self-training is possible using the online resources on instructional strategies and the adaptation of curriculum contents as appropriate for online teaching.

The study being reported here focused on preparedness for online teaching and learning. More studies are needed in order to examine the experience of lectures and students during COVID-19 (see, for instance, Kathula, 2020). Future studies in this area could center more on developed competencies of lectures and students. In any case, more systematic studies are needed in taking stock of the outcome of the online teaching and learning, and their impact for the new normal.

One of the blatant limitations of the study is the sample size. Given that there are 74 accredited universities and university colleges in Kenya, and the student population of these institutions of higher learning is estimated to be about 500,000 (Statistica, 2020). Data gathered from mere 372 students are not meant to be a representative sample. The findings provide an indication of the situation of preparedness in offering online teaching and learning in the institutions of higher learning. The second limitation is that the data for this study were drawn from self-reported questionnaire that was circulated online. Being an online questionnaire, there is a great possibility for self-selection and bias in the selection of those who have online access already. Being a self-reported questionnaire, the competency preparedness of the participants was from their own self-perception, hence individuals could be more optimistic. This has been consistently acknowledged throughout the research report. Given the urgency of this study and the current restrictions of movement arising from the COVID-19, an online self-reported questionnaire was the most suitable means of gathering data.

Despite these limitations, the present study sheds some valuable light on the preparedness for online teaching and learning in the Kenyan institutions of higher learning. Since it is likely that online teaching and learning will become an aspect of the new-norm even after the end of COVID-19, the findings of this study have provided some valuable points on the way forward in improving the ICT situation in Kenyan educational institutions. What Kohnstamm (2020) says of work could be applied to teaching and learning too, that it goes without saying that the pandemic has upset study life in 2020. But rather than seeing this period

of forced online teaching and learning as a one-off by-product of COVID-19, it can be understood as an inflection point in a long-coming technology-driven reckoning on the nature of teaching and learning.

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