

The Availability of Infrastructure to Support Digital Learning in Public Universities During the Post COVID 19 Era in Uasin Gishu County, Kenya

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Abstract

Kenya supports lifelong learning to create a globally competitive and adaptable workforce to meet the needs of a rapidly industrializing economy, even during pandemics like Coronavirus disease (COVID-19), which led to the closure of several schools and colleges. The objective of the study was to determine the availability of infrastructure to support digital learning during the post COVID 19 Era in Uasin Gishu County, Kenya. The study was guided by Classical Liberal Theory of Equal Opportunities. The study targeted selected public universities in Kenya, unit of population being head of department, lecturers and students. The study adopted use of descriptive research design. The study used questionnaire and interview schedule as the tools for data collection. The researcher obtained sample size using Yamane formulae. Descriptive statistics were used to analyse the data with the aid of the Statistical Package for Social Sciences (SPSS) version 25. Descriptive statistics included percentages, frequencies, mean mode and standard deviation. Inferential statistic involved the use of correlation and regression analysis. The qualitative data were analyzed using thematic analysis. The study findings revealed that infrastructure has a positive and significant influence on digital learning in public universities during the post COVID 19 Era in Uasin Gishu County, Kenya ($\beta_1=0.236$, $p=0.000$). The study concluded that public universities in Uasin Gishu County are not only still faced with challenges on poor network access in some places poses a challenge to the learning process. Also, they still have less skilled personnel in the University hence low implementation of digital learning. The study recommends that Universities Management should train personnel in order to ensure proper and full implementation of digital learning. Further they should ensure that there is proper installation of network and internet to ensure proper digital learning.

Keywords: Infrastructure, digital, learning, universities, COVID-19

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Introduction

Background of the study

The Corona Virus Disease (COVID-19) pandemic has left education in an uncertain state, and institutions of higher learning have turned to digital learning as a means of preserving the educational experience (Peimani & Kamalipour, 2021). Student and educator perspectives on this rapid shift to digital and remote learning, including those of learning technologists, librarians, and publishers, can be found in the reflections of Higher Education (HE) practitioners. The COVID-19 crisis in 2020 increased the severity and urgency of the disruption caused by online education. Almost all teachers were obliged to teach from a distance, and online learning was the medium of choice. Teachers have to learn new things and develop fresh insights into different methods of teaching and learning during the event (Pan, 2020).

Students are increasingly turning to digital learning to study and access university amenities during the COVID-19 countrywide lockout of online learning services. Having a smartphone or laptop is now considered a must for all students who plan to participate in graduate or doctorate research programs at colleges and institutions (Ali, 2020). By using Information and communication technologies (ICT) tools and media, students can benefit from digital libraries and gain widespread world knowledge in their specialties. Students are encouraged to use online journals in addition to the library's collection of texts and references to stay up to date on the latest developments in their field. Student readiness and proficiency in the use of appropriate software and current technology on their devices, as well as familiarity with online resources, have been stressed repeatedly (Sasere & Makhasane, 2020).

In order for online learning to be a success, teachers and students must collaborate with each other in a way that is both cerebral and emotional in order to effectively communicate and practice their subjects (Schonert-Reichl, Kitil & Hanson-Peterson, 2017). It is possible for

online education to stand the test of time if the school administration and parents are kept up to date on the students' development and involvement. To ensure that the curriculum is properly planned, implemented, and executed, the administration of the institution must provide guidance and provisions as judged appropriate for the completion of courses delivered online. It is critical that teachers reply quickly to students' questions and communicate course requirements in order to maintain students' morale of education even in a virtual environment (Moşteanu, 2021; Hennessy, Kirkpatrick, Smith, & Border, 2016; Collins, & Halverson, 2018; Barbour, LaBonte, Hodges, Moore, Lockee, Trust & Kelly, 2020). Stakeholders' confidence in quick interconnection via the internet, email and WhatsApp messages is essential for the success of online education (Liu & Nesbit, 2020).

Africa's national governments and educational sectors responded differently to the challenge of ensuring access to quality education for everyone. However, private school entrepreneurs were granted more leeway in operating their remote-teaching programs despite most governments taking over physical courses and administering public primary and secondary schools (Gyamera & Burke, 2018). There was no additional intervention at this level of education outside the need that tertiary educational institutions cease face-to-face teaching. As a result, universities and colleges were able to establish their own strategies for retaining students. More than only lack of digital skills, lack of planning and preparedness for digital delivery, and inability to use online platforms inhibited many institutions' rapid transition to the virtual world (de Wit & Altbach, 2021).

Lack of electricity and poor connectivity in Kenya's rural areas contributed to the digital alienation of rural Kenyan students, despite the government of Kenya's private-public collaboration with telecom service providers (Parsitau & Jepkemei 2020). In addition, interoperability and compatibility become a major issue in these groups. It takes a lot of skill

to negotiate internet access. Many students lack access to smartphones and other technology. There will be fewer or no educational resources available to some youngsters as a result of the smartphone war. Children's unsupervised internet access is a concern in households where adults have cell phones. There is also a prohibitive cost to the Internet if electricity and technology are available. When it comes to national exams, rural students find themselves in a vulnerable position (Ravi, 2019).

Statement of the problem

A rapidly industrializing economy requires an internationally competitive and adaptable workforce, and Kenya is dedicated to lifelong training and education to satisfy these needs. The Kenyan government's computer supply initiative, which involved assembling computers in local facilities, was unsuccessful. The difficulties arose as a result of a lack of necessary infrastructure, such as electricity and internet access. As a public health issue of worldwide significance, the World Health Organization (WHO) declared COVID 19 a pandemic in March 2020, which was confirmed by the Center for Disease Control and Prevention (CDC). Several schools and institutions were forced to close due to the COVID-19 outbreak. Numerous institutions, colleges, and universities have phased out face-to-face instruction. Social distance is critical at this level in education and this will have an adverse effect. Educators are looking for new strategies to deal with this challenging situation.

It was recently shown in a study by Aristovnik and colleagues (2017) that a large cross-national sample of 30,383 students from 62 countries were satisfied with both the online teaching experience and the guidance they received from their professors. On the negative side, students complained about their lack of digital proficiency and the increased workload they felt they were experiencing. In addition, the survey found that students with lower socioeconomic status and those studying part-time or in the applied sciences were the most impacted by the changes brought on by COVID-

19 (that is, students that can only afford their educational costs with the help of a scholarship and also part-time students that lost their jobs as a consequence of the pandemic).

Research objective

To determine the availability of infrastructure to support digital learning in public universities during the post COVID 19 Era in Uasin Gishu County, Kenya.

Hypothesis

H₀₁: There is no significant relationship between availability of infrastructure and digital learning in public universities during the post COVID 19 Era in Uasin Gishu County, Kenya

Theoretical framework

The study was guided by Classical Liberal Theory of Equal opportunities. Sherman and wood, advocates of the Classical Liberal Theory of Equal Opportunities were highlighted by Njeru and Orodho (2003), who promote their perspective of the necessity for educational equity for all students. The classical liberal theory of equal opportunities states that each student is born with a certain amount of innate potential. Therefore, schools and other educational institutions should be designed such that able-bodied students from disadvantaged backgrounds can fully benefit from their inherent abilities and rapidly advance in social status.

In this study, the Classical Liberal Theory is relevant since equal educational opportunities would encourage social mobility. For this theory to work, educational systems and institutions must take into account the dynamics of the institutions themselves, as well as the inherent talents of the students they serve in order to eliminate any obstacles or challenges that might stand in the way of their success, whether they be social, cultural, economic, or environmental in nature. Education is a powerful equalizer, which is why it is important to reach out to students who are underserved and underrepresented in society.

Access to quality digital learning resources is essential for students in public universities. The COVID-19 pandemic has highlighted the need for a reliable and accessible digital infrastructure that can support remote learning. However, not all students have equal access to these resources. This is where classical liberal theory of equal opportunities comes into play. By applying this theory, the institution can help ensure that all students in Uasin Gishu County have access to quality digital learning resources (Nyangweso, 2022). Classical liberal theory emphasizes individualism and equality of opportunity as fundamental principles for achieving social justice. In education, this means providing every student with an equal chance to succeed regardless of their background or circumstances. By ensuring that each student has access to quality digital learning resources, institution level the playing field and enable them to compete on an equal footing.

Methodology

Research design

The research design is the strategy for gathering and analyzing data that will yield reliable results. The research design used for this study was descriptive.

Study location

The study was carried out in Moi University main campus and The University of Eldoret.

Target population

This study targeted 3583 respondents comprising of 21 deans, 20 Heads of Department, 151 Lecturers and 3410 students.

Table 1: Target population

	Category	Target Population
Education arts	Dean	1
	Head of Department	12
	Lectures	89
	Year 4	1205
	Year 3	1632
	Postgraduate	177
	Sub totals	3116
Agricultural science	Dean	1
	Head of Department	8
	Lectures	62
	Year 4	136
	Year 3	129
	Postgraduate	131
	Sub totals	467
Total	3583	

Sample size

The researcher used Yamane's formulas (1967) to determine the appropriate sample size.

$$n = \frac{N}{1 + N(e)^2}$$

Where n is the sample size required

N is the population size =3583

e is the level of precision =0.05

$$n = \frac{3583}{1 + 3583(0.05)^2}$$

$$n = 360$$

Sampling technique

The research included a combination of purposive and random sampling strategies to identify university administrators, faculty, and students. To ensure that study items are selected with equal probability for representative learning and replication of lessons and methods to aid industry, simple random sampling is used.

Research instruments

Questionnaires and interview schedules were used in the study.

Validity and reliability of the research instruments

To test the validity of the research instruments, the researcher availed the questionnaires too supervisors and was checked for face validity, content validity, and construct validity.

The internal consistency of the responses was used to determine the research instrument's reliability in this study. Cronbach's Alpha was utilized to quantify the internal consistency, where alpha values run from 0 to 1, with higher alphas indicating greater reliability. Cronbach's Alpha values greater than 0.7 were considered reliable in this analysis. The reliability results are presented in table 2 below

Table 2: Reliability test results

Constructs	Lectures		Students		Deduction
	Items	Cronbach alpha	items	Cronbach alpha	
Infrastructure	4	.918	4	.716	Reliable
Digital learning	4	.869	4	.761	Reliable

Data analysis

The data was cleaned and sorted to get rid of any duplications, mistakes, or other problems that might arise during analysis. In order to better understand the data, SPSS version 25 was utilized to run descriptive statistics on it. Percentages, frequencies, means, medians, and standard deviations were all examples of descriptive statistics. The study used inferential statistics such as regression and correlation analysis.

Results and discussion

Lecturers' response on availability of infrastructure to support digital learning

Table 3 displays the results of a Likert-scale survey given to lecturers, in which they were asked to rate their level of agreement with four statements about the availability of technological resources for online education.

The study results in Table 3 showed that the majority, 9(69.2%) of the respondents, agreed that the University has adequate computers and

students can easily access the internet. On the contrary, 3(23.1%) of the respondents disagreed that the University has adequate computers and students can easily access the internet. Further, the study results also showed, in terms of mean and standard deviation, that the respondents agreed with the statement that the University has adequate computers and students can easily access the internet (Mean=3.69, Standard deviation=1.33).The study findings agreed with The National Center for Education and Statistics (2019) reports that public and private 4-year colleges and universities had computer labs on campus in. Additionally, institutions had wireless internet access available to students. The Pew Research Center (2022) reports that college students have a laptop computer, and have a smartphone. Additionally, 93% of college students use the internet for academic purposes. A study by the Babson Survey Research Group (2022) found that college students believe that having access to technology is important for their success in college. This implies that most universities have adequate computers and students can easily access the internet. However,

it is important to note that there may be some variation in the level of access and resources available across different institutions. For example, some institutions may have more computer labs or faster internet speeds than

others. Additionally, some students may have their own personal computers or smartphones, while others may rely on the resources available on campus.

Table 3: Lecturers response on availability of infrastructure to support digital learning

Statements		SD	D	N	A	SA	Total	Mean	Std
1. Our university has adequate computers and students can easily access the internet	F %	2 15.4	1 7.7	1 7.7	7 53.8	2 15.4	13 100	3.69	1.65
2. The university operates with an updated system to facilitate an online learning management system	F %	2 15.4	1 7.7	2 15.4	7 53.8	1 7.7	13 100	3.92	1.44
3. Both remotely and within the institution, all learners are access to electricity.	F %	5 38.5	1 7.7	2 15.4	3 23.1	2 15.3	13 100	2.92	1.50
4. The University has modern classrooms and lecture halls to support digital learning	F %	1 7.7	1 7.7	2 15.4	7 53.8	2 15.4	13	3.85	1.57

According to the results, 264 (84.9% of the sample) of the respondents agreed with the statement that the University operates with an updated information digital system to facilitate online learning, while 45 (14.4%) of the sample disagreed. Further, the study results also showed, in terms of mean and standard deviation, that the respondents agreed the University operates with an updated information digital system to facilitate online learning (Mean=3.92, standard deviation=1.44). The study findings agreed with the American Council on Education (2022) reports that colleges and universities offer some form of online learning. Additionally, these institutions offer at least one fully online degree program. The Babson Survey Research Group (2022) found that college students have taken at least one online course. Additionally, college students have taken at least one fully online course. A study by the Sloan Consortium (2021) found that online learning can be as effective as traditional face- to-face instruction. Additionally, the study found that

online learning can be more convenient and flexible for students.

This implies that the universities are increasingly using technology to facilitate online learning. This is likely due to the growing demand for online courses and the increasing availability of technology. Online learning can be a valuable tool for students who are unable to attend traditional classes or who prefer to learn at their own pace. The study further revealed that 278(89.4%) of the participants agreed that all learners are access to electricity both remotely and within the institution. On the contrary,25(8%) of the respondents disagreed that both remotely and within the institution, all learners are access to electricity. Further, the study results also showed, in terms of mean and standard deviation, that the respondents disagreed with the statement that both remotely and within the institution, all learners are access to electricity. (Mean=2.92, standard deviation=1.50). However, these findings agree with Teo, Kim and Jiang, (2020) that digital learning has the potential to transform public education. According to Rizvi

and Nabi, (2021) is that the public universities need persistent access to high-speed Internet in and out of school, access to devices that connect learners and educators to the vast resources of the internet and facilitate collaboration and finally digital learning content and tools that can be used to design and deliver engaging and relevant learning experiences.

Finally, the study showed that 237(35.4%) participants agreed that the University has modern classrooms and lecture halls to support digital learning. Contrary to those findings, 60(19.3%) respondents disagreed that the University has modern classrooms and lecture halls to support digital learning. Further, the study results also showed, in terms of mean and standard deviation, that the respondents agreed the University has modern classrooms

and lecture halls to support digital learning (Mean=3.85, standard deviation=1.57). These findings concur with Simamora (2020) that during the COVID 19 pandemic forced education systems worldwide to find alternatives to face-to-face instruction. As a result, online teaching and learning have been used by lecturers and student's on an unprecedented scale to facilitate continuous learning progress.

Students' response on availability of infrastructure to support digital learning

A total of 4 statements were used to determine the students' response on infrastructure to support digital learning and the responses elicited on a 5-point Likert scale are shown in Table 4.

Table 4: Students Response on Availability of Infrastructure to Support Digital Learning

Statements		SD	D	N	A	SA	Total	Mean	Std
1. Our university has enough computers and students can easily access the internet	F %	27 8.7	55 17.7	19 6.1	106 34.1	104 33.4	311 100.0	3.66	1.33
2. The University operates with an updated system to facilitate an online learning management system	F %	6 1.9	39 12.5	2 .6	116 37.3	148 47.6	311 100.0	4.16	1.07
3. Both remotely and within the institution, all learners are access to electricity.	F %	14 4.5	11 3.5	8 2.6	159 51.1	119 38.3	311 100.0	4.15	0.97
4. The University has modern classrooms and lecture halls to support digital learning	F %	7 2.3	53 17.0	14 4.5	96 30.9	141 45.3	311 100.0	4.00	1.18

The study results in Table 4 showed that the majority, 210(67.5%) of the respondents, agreed that the University has enough computers and students can easily access the internet. On the contrary, 82(26.4%) of the respondents disagreed that the University has enough computers and that students can easily access the internet. Further, the study results also showed, in terms of mean and standard deviation, that the respondents agreed with the statement that the University has enough

computers and students can easily access the internet (Mean=3.66, standard deviation=1.33). The study findings agreed with the Commission for University Education (2020) reports that all public universities in Kenya have computer labs with computers for students. Additionally, CUE reports that all public universities have wireless internet access available to students. A study by the Kenya Institute of Education (2022) found that college students in Kenya use computers for academic purposes. This implies that most Kenyan universities have adequate computers

and students can easily access the internet. However, it is important to note that there may be some variation in the level of access and resources available across different institutions. For example, some institutions may have more computer labs or faster internet speeds than others. Additionally, some students may have their own personal computers or smartphones, while others may rely on the resources available on campus.

Also, the study findings noted that 264(84.9%) of the respondents agreed and 45(14.4%) disagreed that the University operates with an updated system to facilitate online learning. Further, the study results also showed, in terms of mean and standard deviation, that the respondents agreed the University operates with an updated system to facilitate online learning (Mean=4.16, standard deviation=1.07). The study findings concurred with Babson Survey Research Group (2022) who found that college students have taken at least one online course. A study by the Sloan Consortium (2021) found that online learning can be as effective as traditional face-to-face instruction. Additionally, the study found that online learning can be more convenient and flexible for students. This implies that online learning can be a valuable tool for students. However, it is important to note that not all online courses are created equal. Some online courses are well-designed and effective, while others are not. It is important for students to do their research and choose online courses that are offered by reputable institutions and that are taught by qualified instructors.

The study further revealed that 278(89.4%) of the participants agreed that all learners are access to electricity both remotely and within the institution. On the contrary, 25(8%) of the respondents disagreed that both remotely and within the institution, all learners are access to electricity. Further, the study results also showed, in terms of mean and standard deviation, that the respondents agreed that all learners are access to electricity both remotely and within the institution (Mean=4.15, standard deviation=0.97).

The study findings concurred with Sovacool and Vera (2014) who noted that access to electricity is crucial for learners both remotely and within the institution. Lack of access to electricity is a barrier to availability of digital devices and broadband for learners and their families/caregivers. School electrification programs provide access to schools, but rarely to households, meaning students' and teachers' homes remain without access. Electricity in schools can be used for educational purposes such as computer classes and night classes, which can be helpful in areas with a shortage of classrooms. This implies that access to electricity is essential for learners both remotely and within the institution, and lack of access can be a significant barrier to education. Efforts to increase access to electricity in schools and households can help to improve educational outcomes.

Finally, the study showed that 237(35.4%) participants agreed that the University has modern classrooms and lecture halls to support digital learning. Contrary to those findings, 60(19.3%) respondents disagreed that the University has modern classrooms and lecture halls to support digital learning. Further, the study results also showed, in terms of mean and standard deviation, that the respondents agreed the University has modern classrooms and lecture halls to support digital learning (Mean=4.00, standard deviation=1.18).

From the findings of the study, it was evident that responses to the 4 statement used to explain the students' response on the infrastructure to support digital learning had an overall mean of 3.9 and a standard deviation of 1.1. This shows that majority of the respondents agreed on the statements of infrastructure to support digital learning in public universities in Uasin-Gishu County. These findings agree with Al-Azawei, Parslow and Lundqvist, (2016) who states that The rapid growth of Information and Communication Technologies (ICTs) in the last decades has reshaped the forms of teaching and learning in Higher Education and although many forms of ICT innovations have been used for

educational purposes comprising “computers, the Internet, broadcasting technologies.

Hypothesis testing

In order to test hypothesis H_{01} : There is no significant relationship between availability infrastructure and digital learning in public

universities during the post COVID 19 Era in Uasin Gishu County, Kenya simple linear regression was used. The linear regression analysis models the relationship between the dependent variable digital learning and independent variable infrastructure. The results are shown below.

Table 5: Model summary of infrastructure to support digital learning

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.354 ^a	.125	.122	.66189

a. Predictors: (Constant), Infrastructure.

The coefficient of determination (R^2) and correlation coefficient (R) shows the degree of association between infrastructure and digital learning in public universities. The results of the linear regression in Table 5 indicate that $R^2 = 0.125$ and $R = 0.354$. R value indicates that there is a strong linear relationship between infrastructure and digital learning in public universities. The R^2 indicates that explanatory power of the independent variables is 0.125.

Adjusted R^2 is a modified version of R^2 that has been adjusted for the number of predictors in the model by less than chance, the adjusted R^2 of 0.122 which is slightly lower than the R^2 value is an exact indicator of the relationship between the independent and the dependent variable because it is sensitive to the

addition of irrelevant variables. The adjusted R^2 indicates that 12.2% of the changes in strategy implementation are explained by the model while 87.8% is not explained by the model.

This implies that infrastructures had an effect on digital learning in public universities. These results are consistent with the findings by Hadullo, Oboko and Omwenga (2017) who noted a model for evaluating e-learning systems quality in higher education in developing countries. On contrary to this maintenance of a good infrastructure provides a room for better digital learning.

The study used Analysis of variance to check whether the model could forecast the result better than the mean, as seen in Table 6.

Table 6: ANOVA of Availability of infrastructure to support digital learning

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19.357	1	19.357	44.185	.000 ^b
	Residual	135.371	309	.438		
	Total	154.729	310			

a. Dependent Variable: digital learning

b. Predictors: (Constant), infrastructure

From Table 6 the f test provides an overall test of significance of the fitted regression model. THE F value indicates that all the variables in the equation are important hence the overall regression is significant. The F-statistics produced (F = 44.185.) was significant at $p=0.000$ thus confirming the fitness of the model and

therefore, there is statistically significant relationship between infrastructure and digital learning in public universities. The study therefore rejects the null hypothesis; H_{01} That, there is no significant relationship between infrastructure to support digital learning in public

universities during the post COVID-19 Era in Uasin Gishu County, Kenya.

Table 7 below shows the estimates of β -value and gives contribution of the predictor to the model.

Table 7: Availability of infrastructure to support digital learning

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients Beta		
1	(Constant)	2.910	.184		15.855	.000
	Availability Infrastructure	.300	.045	.354	6.647	.000

The Table 7 indicates there was positive linear relationship between infrastructure and digital learning. Infrastructure was significant ($p=0.000$) in digital learning contributing 30%. This implies that infrastructure has an influence in supporting digital learning in public universities.

Since the ($\beta_1=0.300$, $p<0.05$) the study rejected the null hypothesis (H_01) and concluded that availability of infrastructure support has significant effect on digital learning in public universities during the post COVID 19 Era in Uasin Gishu County, Kenya. This study is consistent with the findings by Marlena, Dwijayanti and Patrikha (2022) who noted that the availability of infrastructure support affects digital learning in public universities. If students do not have reliable internet access, they may not be able to access course materials or participate in online discussions. This can lead to missed learning opportunities and can make it difficult for students to keep up with the course. If students do not have adequate hardware and software, they may not be able to use the digital learning platform effectively. This can lead to frustration and can make it difficult for students to learn the material. If students do not have access to technical support, they may not be able to troubleshoot problems with the digital learning platform. This can lead to lost time and can make it difficult for students to learn the material. By addressing these infrastructure challenges, institutions can improve the effectiveness of digital learning.

Interview results

The study findings from interviews revealed that the COVID-19 pandemic has

drastically altered the traditional way of learning, forcing educational institutions to adopt remote learning practices. This shift has highlighted the importance of digital infrastructure in public universities in supporting online education. Online learning opportunities can improve the skills of lecturers and students in accessing the internet, proficient in using online learning media/applications such as zoom, google meet, classroom, proficient in using e-learning applications and other digital technologies. The ability to access reliable technology is crucial for students to participate actively and engage with course materials effectively. Furthermore, it is also essential for educators to be equipped with digital tools that enable them to deliver high-quality instruction remotely while maintaining student engagement.

Dean [2] indicated that:

"I recognize the importance of infrastructure to support digital learning in the post-COVID 19 era."

This implies that digital learning is most obtainable and is sustainable with a well-planned and well-maintained infrastructure of EdTech, tools, resources, and access to support teachers and students.

Dean [1] noted that:

"Availability of infrastructure for digital learning makes learning easier and convenient."

This implies that the availability of infrastructure for digital learning makes learning easier and convenient. Students can learn at their own pace and in their own time, regardless of their location. This can be especially beneficial for

students who have busy schedules or who live in rural areas. Students can access digital learning materials from anywhere with an internet connection. This means that they do not have to travel to a physical classroom, which can save them time and money.

Digital learning platforms often offer a wider range of educational resources than traditional classrooms. This can include videos, interactive exercises, and simulations. Digital learning platforms can facilitate collaboration between students and faculty. This can help students to learn from each other and to get feedback on their work. Digital learning can be more cost-effective for institutions than traditional classroom instruction. This is because institutions do not have to pay for the construction and maintenance of physical classrooms.

HOD [2] stated that:

"Infrastructure is a prerequisite to implementation of digital learning without which digital learning cannot be possible."

This implies that without these key infrastructure components, digital learning cannot be implemented effectively. The key infrastructure components that are needed for digital learning are: Internet access: Students and instructors need reliable internet access in order to access digital learning materials and to participate in online discussions and activities. Hardware: Students and instructors need computers or laptops with sufficient processing power and memory to run the required software. Software: Digital learning platforms and applications are needed to deliver content, facilitate communication, and track student progress. Support staff: Technical support staff are needed to troubleshoot problems and to provide training on how to use the digital learning platform and applications.

Dean [3] noted that:

"With proper infrastructure the learners and lecturers are in a position to get access to internet without fail."

This implies that by investing in a proper infrastructure, institutions can ensure that their

students and lecturers have the resources they need to succeed in a digital learning environment. This is essential for digital learning, as it allows students to access course materials, participate in online discussions, and collaborate with their peers. The key components of a proper infrastructure for digital learning: Reliable internet access: This is the most important component, as it allows students and lecturers to access course materials and participate in online activities. Sufficient bandwidth: This is important to ensure that students and lecturers can access the internet without experiencing lag or buffering. Secured network: This is important to protect the privacy of students and lecturers, as well as the integrity of the data. Adequate support staff: This is important to troubleshoot problems and provide technical support to students and lecturers.

The HOD [1] said:

"Lack of infrastructure affect the effectiveness of presentation and content coverage in the digit learning."

This implies that lack of infrastructure can affect the effectiveness of presentation and content coverage in digital learning. The ways in which this can happen are: Lack of reliable internet access: If students do not have reliable internet access, they may not be able to access course materials or participate in online discussions. This can lead to missed learning opportunities and can make it difficult for students to keep up with the course. Lack of adequate hardware and software: If students do not have adequate hardware and software, they may not be able to use the digital learning platform effectively. This can lead to frustration and can make it difficult for students to learn the material. Lack of technical support: If students do not have access to technical support, they may not be able to troubleshoot problems with the digital learning platform. This can lead to lost time and can make it difficult for students to learn the material.

The HOD [1] said:

"The COVID-19 pandemic has forced public universities to rapidly adopt digital learning"

platforms and technologies. While many institutions were able to make this transition successfully, others struggled to provide adequate support for their students."

Further, Dean [1] revealed that:

"One of the biggest challenges has been ensuring that all students have access to the necessary technology and infrastructure. Many students do not have reliable internet access at home, and some do not have computers or laptops that are powerful enough to run the required software. This has created a digital divide, with some students at a significant disadvantage compared to others."

This implies that there are a number of factors that have contributed to the challenges faced by public universities in providing digital learning. One factor is the lack of access to technology and infrastructure among students. Many students do not have reliable internet access at home, and some do not have computers or laptops that are powerful enough to run the required software. This has created a digital divide, with some students at a significant disadvantage compared to others.

Another factor that has contributed to the challenges faced by public universities is the lack of training for faculty and staff on how to use the new technologies. Many faculty members are not comfortable using technology in the classroom, and they may not have the time or resources to learn how to use new platforms and software. This has led to some students falling behind in their studies.

Despite these challenges, public universities have made significant progress in developing the infrastructure needed to support digital learning. Many institutions have invested in new technology, and they have developed training programs for faculty and staff. As a result, digital learning is now a viable option for many students.

In the post-COVID-19 era, digital learning will continue to play an important role in higher education. However, it is important to ensure that all students have access to the necessary technology and infrastructure. This will require

continued investment from public universities and policymakers.

Conclusions

The study findings showed that Infrastructure has a positive and significant influence on digital learning in public universities during the post COVID 19 Era in Uasin Gishu County, Kenya. The study results show that majority of both lecturers and students agreed that the University has enough computers and students can easily access the internet. Also, the study findings noted that University operates with an updated system to facilitate online. The study further revealed that majority of both lecturers and students disagreed with the statement that both remotely and within the institution, all learners are access to electricity. Finally, the study findings showed that majority of lecturers and agreed that the University has modern classrooms and lecture halls to support digital learning.

Recommendations

The study recommended that they increase the number of internet-connected devices: This includes laptops, tablets, and smartphones. Students should be able to access the internet from anywhere on campus, not just in the library or computer labs. Improve the quality of internet access: The internet connection should be fast and reliable enough to support online learning. Provide training on how to use digital learning tools: This includes training on how to use online learning platforms, such as as well as how to use software for video conferencing, such as Zoom and Google Meet. Create a dedicated space for digital learning: This could be a computer lab or a learning common. The space should be equipped with computers, internet access, and other digital learning tools. Provide support for students who do not have access to digital devices or internet access: This could include providing laptops or tablets to students who need them, or subsidizing internet access for students who cannot afford it. By taking these steps, public universities in Uasin Gishu County can ensure that all students have access to the digital

infrastructure they need to succeed in a post-COVID-19 world.

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