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COVID and E-Learning, Is It a Curse or a Blessing for Kenya's Education System? Evidence from Selected Public Universities in Kenya

Edith Naliaka

Lecturer, Department of Social Sciences, Kibabii University, Kenya

Abstract:

Emergence of COVID 19 could be a blessing as it has triggered much needed reforms of introduction of E-Learning in Kenya's higher education system as away promoting of access amidst budgetary constraints. However, COVID 19 could spell doom to Kenya's education sector if E-Learning programs are not effectively undertaken. This study aimed at evaluating effectiveness of E-Learning Program in Kenya's public universities. The study aimed evaluating administrative support, state of digital infrastructure and home environment and how they were impacting on effectiveness of E-Learning. The study was undertaken in 5 selected Public universities. The respondents were 80 lecturers, 400 students and 2 academic registrars. Data was captured using questionnaires and interview schedule. The study established that though E-Learning provided the greatest opportunity for promotion of continuity of Learning in higher institutions amidst COVID and opportunity to address the challenge of budgetary constraints and access, the reforms in implementation of the same was low coupled by inadequate digital infrastructure, ill prepared lecturers and learners and unsupportive home environment. The study concluded that there is need to hasten reforms by developing relevant digital infrastructure, enhancement of students and staff training and sensitization of various stakeholders on the need to embrace E-Learning failure to which may see E-Learning become a curse for Kenya's Higher education.

Keywords: E-Learning, Digital infrastructure, Budgetary Constraints, Home environment, Effectiveness of E-Learning

1. Background to the Study

Emergence of COVID 19 in early 2019 brought about historical disruption to globally, by bringing it to standstill with worst hit being educational institutions that majorly relied on Conventional classroom set up for teaching. According to the report of UNESCO (UNESCO, 2020), as of April, 2020, COVID 19 had caused disruption to education sector in over 175 countries as evidenced by closure of educational institutions, a situation that saw over 220 million post-secondary students being about 13 percent of the total number of students affected globally.

COVID-19 is an infectious disease mainly that emerged in 2019, a disease conveyed through precipitations spawned once an infected individual coughs, sneezes, or exhales and these droplets are too heavy to hang in the air, and quickly fall on floors or surfaces (WHO, 2020). According to the Centers for Disease Control and Prevention (2020), individuals may also become infected by coming into contact with adulterated surface and touching their face with its effect being, respiratory challenges with varying intensity from one individual to another depending on bodies' immune system that may vary based on one's medical conditions and age with over 60 years old being at a higher risk of increasing severe disease and death (UNPF, 2020)

As such closure stoppage of operations in various sectors of the society by different governments globally was taken as part of extraordinary dealings for containing the spread of the virus, ramping up health systems and constraining the movement of people (UNPF, 2020). This is the situation that saw many educational institutions closed. Given the importance of education, school closures have negative implications not only students, families and teachers, but have sweeping economic and social significances (Lindzon & UNESCO, 2020). According to Hout (2012), the 21st century higher education hold one of the most important roles in shaping the future of our society by establishing value beyond the private benefits that harden to individual citizens, promotes country's ability to compete in the global economy, creates a path to financial individual security, economic mobility, personal growth, professional development, leadership opportunities, and ones' a brighter tomorrow. Therefore, stoppage of higher education curtails the effort of the individuals and generally the society from reaping the benefits that could have accrued to the society in pursuance of the same.

This is what has informed many Countries Worldwide including Kenya to seek for intervention measures in promotion of Continuous learning in Higher institutions while simultaneously enforcing containment measures of COVID 19. This is where E-Learning has gained entry in many higher Institutions as the best intervention measure during COVID 19 putting in mind that the pandemic may be here to stay. Abbad, Morris, D, de Nahlik, (2009) define, E-learning as the use of Information and Communication Technologies (ICT) in promotion of access to online learning/teaching resources such as wireless and satellite. Rafaeli, Dan-Gur, and Barak, (2005) observe e-learning is online-distance learning as it promotes

attainment and usage of knowledge through electronic means. This is why E-Learning has been considered as a savior during this period of COVID 19 even in institutions that had initially shunned it such as Kenya's public Universities.

Though E-Learning appears to be gaining popularity after emergence of COVID 19, E-Learning had been embraced in several institutions of higher learning globally. Such institutions embraced E-Learning due to advantages that accrue to any education institution that embraces it in its learning process. Among the benefits of E-Learning is its ability to contain the cost education and promotion in flexibility in the learning process, a situation that may be both advantageous to the institutions and the students. Repman, Zinskie, and Downs, (2010) while writing on importance of E-Learning observes that the adoption of E-Learning offers the institutions and their students' flexibility of time and place of delivery or receipt of information in the learning process and it is also cost effective as it offers opportunities for learning to maximum number of learners with minimal physical infrastructures such as buildings. Learning resources such as e-books are also cheaper and can be accessed simultaneously by a large number of students during E-Learning. Munna and Mazumdar (2021) contend that in recent decades, a technological revolution has emerged and moved from a society branded by the living conditions of industrialism to the current information society where inventiveness and creativity arouses and drives the humanity.

He writes: *'a knowledge society is really a learning society...knowledge societies process information and knowledge in ways that maximize learning, stimulate ingenuity and invention, and develop the capacity to initiate and cope with change.'*

The scarcity of resources is a concern as ability to finance the needs of higher educational institution to promote access and quality is wanting with worst hit being developing countries. For instance, Chiroma (2019) observes that Africa is the least developed continent in terms of higher education institutions and enrolments by international standards. This situation is traced to desertion due to scarcity of resources in most of the countries and competing claims from other sectors of the economy rapid growing population which has triggered higher demand for higher education. As a result, African higher education has suffered from underfunding, deterioration of academic and research infrastructure and unsatisfactory service conditions for staff.

Olelewe, and Okwor (2017) who found out that poor power supply, poor internet connectivity and lack of technical support staff are major barriers facing the use of electronic facilities for teaching and learning. It is also in agreement with Colovic-Markovic (2019) who states that developed economies possess adequate facilities for online teaching than undeveloped economies. Therefore, one would have expected many developing countries such as Kenya to have embraced E-Learning programs long before the coming of COVID has a part of the alternative of containing cost of education and enhancing access to higher learning in view of ability of E-Learning to promote the same.

However, Kumar, Kumar, Palvia, and Verma (2017) observable that in e-teaching, trainers/teachers are expected to take control convergence of digital learning. Effective building of e-teaching requires competencies for effective planning of e-teaching, facilities and equipment for implementing e-teaching, operational skills or competencies for preparing lecturers for using e-teaching facilities, skills in troubleshooting e-teaching system and attitude management skills. Olelewe, Osinem, and Rose-Keziah (2020) observe that the benefits that accrue may accrue from E-Learning are likely to be eroded if barriers in provision of digital infrastructure for promotion of its effectiveness are not addressed. Building e-teaching capacity of lecturers is key in effective undertaking of E-Learning.

Could emergence of COVID be a blessing to Kenya's higher educational institutions by being an eye opener for promotion access in view of her budgetary constraints or a curse? The answer lies in evaluation of preparedness of Kenya's higher institution to size and turn challenges presented by emergence of COVID to promote E-Learning. This what this study endeavored to establish

1.1. Research Questions

The study was guided by the following questions

- How is management of Public Universities supporting the adoption of E-Learning in Public Universities in Kenya?
 - What is the state of E-Learning infrastructural facilities at Public Universities in Kenya?
 - To what extent has home environment supported E-Learning of students in Public Universities in Kenya?
- Further to the above, the study aimed at evaluating the following hypothesis;
- Ho: There is no significant difference between E-Learning environment and Effective learning among students in Public Universities in Kenya

2. Theoretical Framework

Technology Acceptance Model (TAM) was the comprehensive hypothetical paradigm that guided this study. The TAM theory as advanced by Joo, Park, and Lim, (2018) state that effectiveness and performance of a new program such as technological changes can only be successful with acceptance of the users. The theory advances that the acceptance of any innovation particularly that which is based on information technology, calls for the acquisition of computer-based instruments that may enhance the making of decisions as well as planning communication. Nonetheless, there are risks with such systems. As such, it is extremely important that the new systems meet specifications derived from organizational preference and reasoning. It also makes sense to recognize that individuals may not be open to technological shifting. There should be an attempt to explain why individuals object to change and the viable methods for overcoming their concerns. The correct organizational culture ought to be instilled, with the intended shift being implemented gradually and supported by communication.

According to Kamel (2014), applicants should be well-informed on their roles in the change process and supported in order to handle their parts well. Two hypotheses form the basis of the concept of technology acceptance: The model introduces the understanding that the willingness to accept and apply emerging technology is dependent on the feelings of the user regarding the system in relation to its supposed benefits. The theory informs the study by addressing the staff training variable. Some individual will accept the adoption of innovation if they believe that it will improve their job performance thus performance expectancy. On the other hand, employees will easily accept the adoption of innovation if they believe that the introduction of the system will reduce their effort in performing the required duties.

3. Methodology

The study embraced correlation research design. According to Saunders; Lewis and Thornhill (2007) Correlation research design are appropriate for studies where it is not possible to subject autonomous variables to random transfer of subjects, action and devious control. This design enabled the researcher to determine the association between independent study variables (supportive digital variables) and independent study variable (effectiveness in adoption of E-Learning). The study was involved a survey that involved 400 Students proportionally spread across five Public Universities Kenya, 80 Lecturers and 2 academic registrars making total respondents to be 482 respondents. Data was collected using questionnaires and interview schedule. Questionnaire was used to collect data from students and trainers while interview schedule was used to collect data from academic. Analysis of quantitative data was done with assistance of Statistical Package of Social Sciences (SPSS) Version 23 Software while qualitative data was analyzed thematically data using inferential statistic. This involved running of Correlation and Regression in order to test the relationship between and among variables.

4. Results

This section presents results to the following three study research questions that were under investigation. However, before seeking results for various study variables, the study first sought to establish whether indeed it was true that the variables(independent) have any influence on dependent variable (Effectiveness in implementation of E-Learning). Positive statements relating to the above variables were given to lecturers' respondents and scored. Data obtained generated was used to undertake regression analysis whose results are presented in Table 1

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.729	.422		6.471	.000
	Managerial support is critical in effective implementation of E-Learning	-.570	.141	-.387	-4.027	.000
	Effective undertaking of E-Learning calls for adequate digital infrastructure	.373	.115	.320	3.253	.002
	Supportive Home environment is critical for promotion of effective e-learning	-.226	.103	-.201	-2.197	.031

Table 1: Regression Analysis Showing the Relationship among Study Variables

a. Dependent Variable: E-Learning If Successfully Implemented Can Promote Access And Quality Education

The findings in Table 1 reveal that all independent study variables have influence on effectiveness of E-Learning as all independent variables had P values ≤ 0.05 .

Further to regression equation, regression model was developed. This was aimed at establishing on overall the composition of independent variables in dependent variable

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.637 ^a	.406	.383	.64470
a. Predictors: (Constant), Supportive Home environment is critical for promotion of effective e-learning, Managerial support is critical in effective implementation of E-Learning, Effective undertaking of E-Learning calls for adequate preparation of Lecturers in the same				

Table 2: Model Summary Regression

Table 2 show that he adjusted R Square from the table is 0. 383.This implies that 38.3 percent of effectiveness of E-Learning can be attributed to independent study variables.

- Research Question One: How has Management Public Universities supported the adoption of E-Learning in Public Universities in Kenya?

Data to address the objective was captured from lecturers' responses on positive statement relating to various aspects of managerial support that may go a long way in influencing effective E-Learning designed on Likert scale. The study sought information on budgetary allocation, training of both lecturers and students, acceptance of E-Learning program and administrative monitoring of the program. The findings are given in Table 2-5.

		Frequency	Percent	Valid Percent	Cumulative Percent
	SA	12	14.5	15.0	15.0
	A	33	39.8	41.3	56.3
	UD	12	14.5	15.0	71.3
	D	19	22.9	23.8	95.0
	SD	4	4.8	5.0	100.0
	Total	80	96.4	100.0	

Table 3: Universities Have Increased Budgetary Allocation for Digital Infrastructures

Findings in Table 3 show that majority of lecturer respondents (over 55%) agreed or strongly agreed that budgetary allocation towards digital infrastructure in have been increased. This situation may be attributed to need to actualize E-Learning programs due to disruptions in education system occasioned by outbreak in COVID 19. This is a positive step since availability of digital infrastructure depends upon budgetary provision of the same.

Groff (2013) observes that any program cannot succeed without clear administrative ownership, sufficient resources and sturdy stakeholder support. Such support is evidenced adoption in study region as evidenced by budgetary allocations.

SA	4	4.8	5.0	5.0
A	23	27.7	28.7	33.8
UD	8	9.6	10.0	43.8
D	16	19.3	20.0	63.7
SD	29	34.9	36.3	100.0
Total	80	96.4	100.0	

Table 4: All Lecturers and Students Have Been Adequately Trained on How to Use E-Learning Platform

Findings from Table 4 reveal that majority of lecturers respondents (over 65) were in agreement that both lecturers and students have not been adequately prepared on how to effectively use E-Learning Platform as only 33 percent of the respondents were in agreement with the affirmative statement. This situation is likely to compromise effectiveness of E-Learning program in study institutions.

Writing on the need for training, Clarke and Zagarell (2012) contend that teaching and learning in the regime of digital development, climatic variability and knowledge society has presented paradigm change in skill demand and practices. They observe that there is rapid movement in technological development is presenting short life cycle of technologies that have already been invented. Increasing improvement and advancement have led to continuous technological inventions, making it hard to retain skills so far invented. This means lecturer and students need to be continuously supported to acquire relevant skills such as E-Learning skills.

		Frequency	Percent	Valid Percent	Cumulative Percent
	A	6	7.2	7.5	7.5
	UD	3	3.6	3.8	11.3
	D	46	55.4	57.5	68.8
	SD	25	30.1	31.3	100.0
	Total	80	96.4	100.0	

Table 5: As A Result of Training, All Students and Lecturers Have Positively Embraced E-Learning Program

Table 5 reveals that majority of lecturers respondents' (over 85%) affirmed that both lecturers and students had not embraced positively E-Learning program. This situation is likely to be traced to inadequate training that had been given.

Supporting the position of existence of reluctance in adoption of E-Learning by both lecturers and students, through interview one academic registrar had this to say;

-----any new program will always be resisted more so if such program comes with new demands. Forinstance, majority of lecturers have been used to conventional face to face teaching with some even rarely taking time to undertake any preparation since they may have taught same content repeatedly making them to master such content

as it is taught repeatedly-Learning therefore comes with new demand of curriculum delivery with worst hit being the aged who may be technological averse. For students, E-Learning has meant that they have to learn from home, such program brings about the loss of pride that comes with one being at the university. Therefore, resistance has to be there but these parties will soon find it normal.

Langat (2015) observe that negative dispositions induce tendencies of fear, anxiety and stress where one resorts to other nonproductive practices which finally prevents them from experiencing the richness that accrue from learning and many alternative ways that could be used to enhance competencies in the subject. Consequently, one ends up exhibiting low motivation, decreased level of participation, boredom and behavior problems including lesson avoidance

SA	7	8.4	8.8	8.8
A	16	19.3	20.0	28.7
D	20	24.1	25.0	53.8
SD	37	44.6	46.3	100.0
Total	80	96.4	100.0	

Table 6: E-Learning Program Is Effectively Monitored by Management to Ensure That Learning Is Effectively Undertaken

The results in Table 6 reveal that minority of lecturer respondents were in agreement that E-Learning Program was effectively monitored by management. Failure to effectively monitor E-Learning program is likely to compromise ability management to identify challenges encountered in implementation of E-Learning programs for intervention measures.

Ngure (2013) states that monitoring is critical element of any program implementation as it promotes the understanding of constraints that may need to be overcome in order to promote of the program such as E-Learning for this case.

- Research Question Two: What is the state of E-Learning infrastructural facilities in Public Universities in Kenya?

This objective was aimed at establishing the state of digital infrastructure at study institutions. Various Positive statements relating to infrastructure and E-Learning and designed on Likert Scale were given to lecturer's respondents and scored. The findings are presented in Table 6-

		Frequency	Percent	Valid Percent	Cumulative Percent
	SA	5	6.0	6.3	6.3
	A	17	20.5	21.3	27.5
	UD	7	8.4	8.8	36.3
	D	31	37.3	38.8	75.0
	SD	20	24.1	25.0	100.0
	Total	80	96.4	100.0	

Table 7: My Institution Has Well Developed Website Which Promotes Administration Of Examination Without Any Challenge

Table 7 shows that less than 30 percent of respondents were in agreement that website in their institutions was well developed enough to promote administration examination without a challenge. This is likely to imply that many institutions were experiencing challenges in promoting E-Learning. The administration of online examination maybe is cost-effective but it also brings its own technicalities of handling dispersed examination through multiple locations. The greatest puzzling fragment of undertaking a remote online exam is its invigilation (<https://blog.epravesh.com/top-4-challenges-manage-online-exam-process/>)

		Frequency	Percent	Valid Percent	Cumulative Percent
	SA	12	14.5	15.0	15.0
	A	21	25.3	26.3	41.3
	UD	2	2.4	2.5	43.8
	D	29	34.9	36.3	80.0
	SD	16	19.3	20.0	100.0

Table 8: My Institution Has a Well-Established E-Library Which Enables Our Students to Access Any Information They May Need for Their Studies

Table 8 shows that majority of lecturers respondent (over 55%) affirmed that their institutions did not have well established libraries to enhance E-Learning. This is likely to imply that majority of students were experiencing challenges accessing necessary materials during E-Learning.

One academic registrar had this to say;

-----yes it may be true that we may not be having well developed e-library. However you have to put in mind that COVID 19 is what has triggered some of the reforms that we are currently undertaking and I belief that even when

COVID is wiped out we may look back and see that indeed the coming of COVID was a blessing because it has triggered reforms that are promoting e-learning, an area that we never taught about exploiting despite the potential opportunities it presents both to all stakeholders in the learning process such as containment of cost of education provision.

		Frequency	Percent	Valid Percent	Cumulative Percent
	SA	14	16.9	17.5	17.5
	A	15	18.1	18.8	36.3
	D	39	47.0	48.8	85.0
	SD	12	14.5	15.0	100.0
	Total	80	96.4	100.0	

Table 9: My Institution Always Gives Bundles to All Students Attending Online Classes Regularly in Order to Ensure That All Our Students Do Not Out on Lesson Attendance

The findings on support given by institutions to enhance e-learning in Table 9 reveals that only 36 percent of lecturers' respondents acknowledged that the institutions facilitated their students to access online learning through of provision of bundles. The study established that two study institutions facilitated their students with 30 GB bundles delivered on every first day of the Month. This is a positive step as it minimizes the challenges that students are likely to face in accessing e-learning due to cost implication.

		Frequency	Percent	Valid Percent	Cumulative Percent
	SA	5	6.0	6.3	6.3
	A	17	20.5	21.3	27.5
	UD	7	8.4	8.8	36.3
	D	31	37.3	38.8	75.0
	SD	20	24.1	25.0	100.0
	Total	80	96.4	100.0	

Table 10: My Institution Has Well Developed E-Learning Platforms Which Promotes E-Learning without Any Challenge

The findings in that less than 30 percent of respondents were in agreement that has well developed e-learning platforms for promotion of E-learning. This implied that majority of institutions did not have well developed E-Learning platforms, an indicator that majority of institutions were likely to be experiencing challenges in promotion of e-learning.

- Research Question Three: To what extent has Home environment supported E-Learning of students in Public Universities in Kenya?

Data to address this objective was captured from 400 students' respondents proportionally spread across 5 public Universities. Positive statements relating to student's home environment designed on Likert scale were put to students' respondents. Data captured was used to generate descriptive statistics presented in Table 11

	N	Minimum	Maximum	Mean	Std. Deviation
My Home environment is contusive for e-learning as there is limited disturbance during e-learning	400	1.00	5.00	3.6750	1.14488
I have supportive economic backing that has enabled me acquire digital resources, a situation that has seen me access comfortably e-learning	400	1.00	5.00	3.4125	1.44690
My home area has adequate of network coverage which enabled me to access e-learning without any problem	400	1.00	5.00	2.3500	1.15944
Our home is adequately supplied with adequate and uninterrupted power which enabled me access e-learning without any challenge	400	1.00	5.00	3.3375	1.41371
Valid N (listwise)	400				

Table 11: Descriptive Statistics of Positive Statements Relating to Home Environment and E-Learning

Table 12 shows means and S.D relating to variables that were under investigations on basis of student's responses. The results reveal that all variables had mean above 3.3 and S.D above 1.1 save for network coverage that had a mean of 2.35 and S.D of 1.15944. Affirming this position through interview one academic registrar had this to say;

----most students may be experiencing challenges in finding home environment conducive for E-Learning. Indeed, some parents may not be aware that a student may learn from home because they are used to conventional method of learning. Such parents may keep assigning domestic chores to such students. Similarly, students may interference as from visitors or disturbance from siblings preventing them from having a quite environment where they can concentrate on learning. This situation is worsened by the poor attitude of majority of learners themselves who have negative attitude towards E-Learning.

This situation shows that state of student's home environment was inclined towards unsupportive in view of demands for effective E-learning.

5. Inferential Statistics

On basis of study findings, based on lecturers' responses variables that had highest mean deviation were used to run correlation against responses on effective E-Learning. This was aimed validating the following hypothesis

- Ho: There is no significant difference between E-Learning environment and Effective learning among students in Public Universities in Kenya

The findings are presented in Table 12.

Variable Statement		X1	X2	X3	X4	X5	X6	X7
All lecturers and students have been adequately trained on how to use E-Learning Platform(X1)		1						
	80							
As a result of training, all students and lecturers have positively embraced E-Learning Program	.113	1						
	.319							
	80	80						
E-Learning program is effectively monitored by management to ensure that learning is effectively undertaken	.471**	.040	1					
	.000	.727						
	80	80	80					
My institution has well developed website which promotes E-Learning without any challenge	-.419**	.160	-.122	1				
	.000	.156	.281					
	80	80	80	80				
Our digital infrastructure is up to date and fully functional that when administering online examination, we are able to monitor all students as they undertake their examinations online	-.036	.189	-.550**	-.110	1			
	.751	.093	.000	.333				
	80	80	80	80	80			
My institution always gives bundles to all students attending online classes regularly in order to ensure that all our students do not out on lesson attendance	.713**	.401**	.293**	-.458**	.095	1		
	.000	.000	.008	.000	.402			
	80	80	80	80	80	80		
E-Learning if successfully implemented can promote access and quality education	-.594**	-.438**	-.601**	.264*	.120	-	1	
	.000	.000	.000	.018	.291	.665**		
	80	80	80	80	80	80	80	

Table 13: Correlation between Selected Study Variables and Effective E-Learning

** Correlation Is Significant at the 0.01 Level (2-Tailed)

* Correlation Is Significant at the 0.05 Level (2-Tailed)

The findings in Table 13 reveal that correlation between the variables weighed against successful E-Learning was very low ranging from .264 as the highest to .665 as the lowest. This meant that there was statistically significant difference between E-Learning environment and Effective learning among students in Public Universities in Kenya. As

such the hypothesis that postulated that there is no significant difference between E-Learning environment and Effective learning among students in Public Universities in Kenya was rejected.

Writing on importance of environment Kamuti (2015) in research on the influence of home environment on academic performance of students in established that Parents' economic status influences academic performance their children student since they will be able to meet cost associated to education in good time and provide other learning materials such as books which are critical in the learning process.

6. Conclusion

COVID 19 has provided opportunity for Kenya's higher education institutions to embark on e-learning, a belated program which could have been introduced long time ago as a way of addressing budgetary constraints and education provision. However-learning in is facing challenges ranging from adequacy of digital infrastructure, attitude of both staff and students and unsupportive home environment. If these challenges are not addressed urgently, the blessing to reform Kenya's education sector occasioned by COVID 19 may turn to be a curse since continued of education remains uncertain amidst COVID and quality of education remains at stake in view unconducive E-Learning prevailing environment

7. Recommendations

There is need to for learning institutions to address the challenge of baby pace reforms in E-Learning and address the challenges of digital infrastructure, training of both staff and students and all parties involved in learning process should be sensitized on the gains that are likely to accrue from E-Learning so that they may embrace it and play appropriate role to enhance its success.

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