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Availability of ICT Devices and Learner Participation in Bachelor of Education Programme by E-Learning at the University of Nairobi

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Abstract: ***Information communication technology (ICT) is unstoppable and is opening new pathways in the education sector. At the University of Nairobi, ODeL Campus is tasked to move some of the University programmes from purely traditional face to face teaching to digital platforms. For programmes to go online, there is mandatory infrastructure that must exist which include but not limited to internet connectivity, ICT devices and electricity. This study focused on the Bachelor of Education - Arts (B.Ed.) programme by e-learning at the University of Nairobi, with the objective of assessing the influence of ICT devices on learner participation in the programme. Since the introduction of LMS and particularly the Moodle LMS in the programme, there has been slow transition of B.Ed. students by distance learning to e-learning. To establish the cause of slow migration, data was collected on availability of ICT devices to the students from a random sample of 70 students out of 250 in their final year of study. The data was analysed and results showed that 66% of the respondents have ICT devices that are available for their use. There was also a moderate but significant correlation between availability of ICT user devices and learner participation in e-learning of p=0.00<0.05, suggesting that availability of ICT devices is an important factor in learner participation in the programme. Further examination by regression analysis showed that availability of ICT user devices account for 45.6% of the variance in learner participation on the e-learning platform. The coefficient of regression was also significant at p=0.000<0.05. It was concluded that ICT devices have a positive and significant influence on learner participation in e-learning. It was recommended that learners should be encouraged, assisted or required to have ICT devices to enhance participation. Secondly, the University should make it a requirement for students who wish to enrol in e-learning programme to have ICT devices. Further it was suggested that the university collaborate with industry payers to avail affordable devices to students that can be used for learning purposes.***

Keywords: Availability of ICT devices, learner participation, e-Learning

1. Introduction

Information communication technology has burst the bubble of traditional main stream systems of education. The world is at a stage where all one needs is an ICT device and availability ofbroadband fiber optic to learn anywhere any time.The world is at the forth industrial revolution spearheaded by technology. According to Schwab (2016), we should grasp the opportunity and power we have to shape the forth industrial revolution and direct it towards a future that reflects our common objectives and values. Schwab (2016) further notes that there has never been a time of greater promise or one of greater potential peril. The year 2020 did not only cement this assertion but opened the eyes of many institution managers to the need of adopting technology. Technology has not only influenced industrial economy but also impacted on education delivery in anunprecedented away.

Over the years, University of Nairobi has distinguished itself as a lead institution in distance education in the region. In 2016, distance learning made a milestone when the Unversity Council approved the creation of a Campus fully dedicated to Open, Distance and e-Learning (ODel). This move was a major milestone in the provision of education to online learners. With the creation of a learning management system (LMS) that is dedicated to administration, documentation, tracking, reporting and delivery of education courses, the multimedia platform has revolutionized the provision of education services to the learners in the programme. Like in many developing countries, University of Nairobi had relied heavily on print for many years as the major medium of learning content (Otieno,Keiyoro, Bowa and Mulwa, 2016). With rapid technological changes that have taken place worldwide, the University of Nairobi has embraced innovative ways of delivering e-learning content to the learners, including the use of e-class.

Studies done across the African content on e-learning by Mudasiru (2006), Gunga and Ricketts (2007), Yakubu and Dasiku (2019) and Adarkwah (2020) all cite the central importance of availability of ICT in distance learning. Indeed many developing countries that have adopted e-learning have faced challenges of technology and especially financial implications not only on the institutions but also governments.

Despite the investment made by theUniversity to move bachelor of education online, there has been a very slow move by the students to embrace the use of e-class. The study therefore sought to establish the cause of this slow response of learners by establishing how availability of ICT devices to learners influence learner participation in e-learning. Learner participation was defined as registering for course units on SMIS and reading learning content and accessing assignments on LMS and other learning courseware on the internet by the learner. ICT devices, on the other hand, includedsmart phones, lap top computers, desk top computers, iPhones, ipads and tablets.

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2. Methodology

The study applied cross-sectional survey research on a random sample of 70 Bachelor of Education (Arts) students

selected from a target population of 1,200 students in the programme at the University of Nairobi. Data was collected by questionnaires and the response rate was 55 students. The responses included opinions on the extent of agreement by informants with statements about the indicators of the variables in the study and measurements were made on a five point Likert Scale, ranging from 1 to 5, where 1 is strongly disagree, 2 disagree, 3 neutral, 4 agree and 5 strongly agree. Informants were also asked to rate variable indicators on Visual Analogue scale of 1 to 10, where 1 is the lowest score and 10 is the highest score. In data analysis, summary statistics was used to show the overall distribution of responses around the mean for every variable in the study.. This was followed by correlation analysis which was used to show the strength and direction of association between independent and dependent variables. Finally, regression analysis was used to test the research hypotheses and to show the explanatory power of the independent variable (availability of ICT devices) on the changes in the dependent variable (participation in e-learning). The level of significance for acceptance or rejection of the null hypotheses was set at p=0.05.

3. Analysis of Findings

The objective of the study was t**o a**ssess the influence of availability of ICT devices on learner participation in theBachelor of Education – Arts - . programme bye-learning at the University of Nairobi. Table 1 shows the responses that were obtained from learners in the programme concerning availability of ICT devices for their use. Thirty four per cent of the respondents strongly disagreed, disagreed or were neutral while 66 per cent either agreed or strongly agreed that ICT devices were available for their use. The responses indicated that the ICT devices were available for use to a majority of learners with a mean of M=3.65 and a standard deviation of SD=1.092 as indicated in Table 1.

Table 1: Descriptive statistics on availability of ICT devices for use

Responses		Frequency	Percent	Cumulative Percent
Valid	Strongly disagree	2	3.6	3.6
	Disagree	8	14.5	18.2
	Neutral	9	16.4	34.5
	Agree	24	43.6	78.2
	Strongly Agree	12	21.8	100.0
	Total	55	100.0	

Minimum 1, Maximum 5, Mean 3.65, Std Deviation 1.092.

Further examination using correlation analysis showed a moderate correlation of r = 0.65 between availability of ICT devices for use and learner participation in the B.Ed. programme offered by e-learning (Table 2).

Table 2: Correlation between availability of ICT devices for use and learner participation in B.Ed. programme by e-Learning

		ICT devices and Internet Service are available for my use	Learning Platforms enable me to study/ participate in the programme
ICT devices and Internet Service are available for my use	Pearson Correlation	1	.675**
	Sig. (2-tailed)		.000
	N	55	55
Learning Platforms enable me to study/ participate in the programme	Pearson Correlation	.675**	1
	Sig. (2-tailed)	.000	
	N	55	55

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation coefficient was found to be significant at p=0.00 < 0.05. This suggested that availability of ICT devices for use by learners could have an influence on learner participation in the B.Ed. programme offered by e-learning.

Linear regression analysis was then used to test the null hypothesis, H_o: Availability of ICT user devices do not significantly influence learner participation in the B.Ed.programmes by e-Learning at the University of Nairobi. A summary of the results is shown on Table 3.

Table 3: Model summary for regression of availability of ICT user devices on learner participation in B.Ed. programme by e-Learning

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.675[a]	.456	.445	2.119

a. Predictors: (Constant), ICT devices and Internet Service are available for my use

The regression coefficient obtained was R=0.675, with a coefficient of determination of R^2=0.456. Thus, 45.6 percent of the variance in participation of learners in e-learning could be explained by availability of ICT devices for accessing the e-learning platforms.

Analysis of variance (ANOVA) was further used to assess the goodness of fit of the regression model for the data analysed (Bryman, 2012). Results in Table 4 show that the F-calculated (F=44.66) was greater than F-critical (4.06), with p=0.00< 0.05. This means that the model is a good fit for the data analysed and may be used in predicting learner participation in programmes by e-learning using "availability of ICT user devices for learners".

Table 4: ANOVA[a] for regression of availability of ICT user devices and internet service on learner participation in B.Ed. programmes by e-Learning

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	199.257	1	199.257	44.356	.000[b]
	Residual	238.089	53	4.492		
	Total	437.345	54			

a. Dependent Variable: Learning Platform enable me to study/participate in the programme
b. Predictors: (Constant), ICT device and Internet Service are available for my use

Further analysis was done by examining the regression coefficients presented in Table 5. The results indicated that availability of ICT user devices has a positive and significant influence on learner participation in the B.Ed. programme by e-learning, with β=0.729 (t=6.66, p=0.000<0.05). Thus, the null hypothesis was rejected and the alternative accepted that availability of ICT user devices has a significant influence on learner participation in the programme by e-learning at the University of Nairobi. Learner participation in the programme by e-learning 'Y' can be predicted, in part, by availability of ICT user devises 'X' using the model, Y= 0.907 + 0.729 X.

Table 5: Coefficients[a] of regression of availability of ICT user devices and internet service on learner participation in B.Ed programme by e-Learning

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.907	.638		1.421	.161
	ICT device and Internet Service are available for my use	.729	.109	.675	6.660	.000

a. Dependent Variable: Learning Platforms enable me to study/participate in the programme

4. Discussion of Findings

Since its inception, distance learning, in all forms, has relied on technology. ICT has been the driving tool behind the delivery of learning content and e-learning is no exception. In this study, the significance of availability of ICT devices to learners has brought to the fore the need to interrogate the preparedness of learning institutions to offer learning through technology. From the findings of the study, the greater the access to ICT devices, the greater the participation in e-learning. This is supported by Seema and Vipin (2021) who found out in their study that technology mediated teaching-learning process creates the need to adjust, adopt and use technology. Nevertheless, results of this study also suggest that even when technology is available, other factors influencing participation in e-learning also come into play. This can explain why only 45.6 per cent of the variance in participation in e-learning could be explained by availability of ICT devices. For the B.Ed. programme of the University of Nairobi that has been conducted through study modules in print form, students have come to rely heavily on these pre-prepared study units to the extent that even when the same materials were uploaded in e-class which is a re-modeled Moodle platform, some students were not willing to use them on the platform.. There is need therefore for adjustment on the side of learners so that they can adopt technology use for learning purposes. The slow migration to e-class by some B.Ed. students of the University of Nairobi also confirms the Technology Acceptance Theories by Alaa and Shadi (2017) that when users perceive technology as important to the goals of work and the consequences of using the system as useful, they will easily adopt it and that behavioral intentions are imperative in regard to technology.

Results of the study also indicate that 34 percent of the respondents do not have adequate access to ICT devices that they need for e-learning. In order for e-learning adoption to move fast, ICT devices should be available to learners. A study by Ghavikekr and Rosdy (2015) in Pakistan showed that ICT infrastructure is not even sufficiently available for institutions, leave alone individual learners. This poses a major challenge to e-learning as students have either to borrow devices or learn in turn. As noted by UNESCO (2020), students without ICT devices risk being left behind especially as a number of countries adopt online learning during COVID- 19 pandemic. The concerns of academics on the efficacy of e-learning in the absence of ICT devices is indeed summed up by Adarkwah (2020) who questioned the post COVID-19 adoption of e-learning and those who may not participate due to lack of necessary devices.

From the discourse, it is clear that for learners to participate effectively in e-learning, they must have access to ICT devices. This will also facilitate technology adoption among students who are yet to embrace e-learning and prevent the formation of a digital divide between learners.

5. Conclusion and Recommendations

The purpose of the study was to assess the influence of availability of ICT devices on learner participation in the Bachelor of Education (Arts) programme by e-learning at the University of Nairobi. The findings based on data analysis showed that majority of the respondents have ICT devices that they can use to participate in e-learning. Further analysis show that availability of ICT user devices has a positive and significant influence on learner participation in the programme. From the study, there is also a significant number of students who do not have necessary devices that they can use to participate in e-learning. Lack of these devices limit their participation in learning. This means that when ICT devices are available to learners, their level of participation in the programme increases. In view of the foregoing it is recommended that the University of Nairobi should make it a requirement for learners who wish to enroll in programmes offered by e-learning to have ICT devices that they can use in the course. Secondly, learners who possess the devices should be encouraged and inducted to use them to access e-class for learning purposes. Finally, the University should collaborate with relevant players in the ICT industry to procure subsidized devices for students so as to enhance their participation in e-learning.

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