Impact of Learning Management Systems on Distance Learners' Academic Progress in Kenya's Public Universities: A Descriptive Survey.

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ABSTRACT

On one hand, the usage and popularity of the distance learning mode accelerates worldwide. On the other hand, however, current empirical evidence increasingly shows that the distance learners across universities and other institutions are particularly hampered, in terms of progressing and completing their studies as their primary goal. This study specifically examined how learning management systems provided by public universities in Kenya, may influence learners' academic progress. The positivist paradigm, the Equivalence theory, and a mixed methods approach between quantitative and qualitative research, were used, in a descriptive survey design. A random 100 participants from 903 learners of the 2018/2020 cohort of distance learners in the B.Ed. (Arts) programmes was used, with the University of Nairobi and Kenyatta University purposively selected. A self-administered, question-blended questionnaire, supported by a document observation guide, aided data collection and analysis, where descriptive and inferential statistics based on a 77% response rate was done. The results of linear regression analysis (Adj. R^2 =.334, at a P-value .001), indicated a statistical, and significant relationship between LMS and academic progress of the distance learners, concluding that the LMSs used by the universities, accessibility wise, efficiency wise and reliability wise, towards supporting the learners, adversely impacted on their academic prospects, particularly with reference to excessive examination retake rates, dropout rates, and eventually low graduation rates. The study recommends that in addition to adhering to the relevant government and industry policy when implementing distance learning programmes, the universities should undertake LMS-specific training of faculty and learners, provide commensurate LMS-focused infrastructural learner support services, and institutionalize improvement-driven systematic evaluation and monitoring among other interventions. The findings of this study potentially add to the relevant and theoretical literature with respect to the distance learning environment, and more specifically, the the role of learning management systems as key components of the said environment.

Key Words: Learning Management Systems; Distance Learners; Academic Progress; Public Universities; Mode of Educational Transmission.

INTRODUCTION

The usage of distance learning as a mode of delivering educational content delivery continues to expand, driven by varying factors, including the advent of Covid 19 pandemic, whose aftermath in the education sector still lingers. However, even as the uptake of this learning mode increases, it has been increasingly evident that distance learners (students who mainly take their courses electronically, through mediated technological methods) have been hampered, in terms of successfully progressing and completing their courses on time. In this regard, the available relevant literature reveals increasing learner attrition, particularly excessive dropout rates. In turn, this has led to dwindling course completion rates as empirically evidenced.

In Europe, the United Kingdom, and Africa, for instance, some key distance learning-modelled education providers present good cases in this regard. For instance, the UK Open University, Athabasca University, and

University of South Africa (Simpson, 2012) stand out. In Nigeria, Olatunbosun (2020), established that there were declining enrolment rates, increasing dropout rates, and declining graduation rates in the National Open University of Nigeria. Similarly, student dropout rates at Open University of Tanzania were found to rise with the enrolment rates, mainly because of inadequate technology-related learner support services among other factors.

On the same note, Kisimbii, Gakuu and Kidombo (2019), pointed out that in spite of exerted efforts towards increasing the rates of retaining and graduating learners, the same had stayed comparatively low in the University of Nairobi in Kenya. Seeming to affirm this, Ndege, Ndiritu, Mwangi & Gatotoh (2023), asserted that distance learners in universities in Kenya continued to suffer high attrition rates, and low retention rates. Mbugua, Bowa, Gakuu, & Mboroki (2018), seem to cement the foregoing state of affairs, emphasizing that although distance learning delivery modalities had been practiced for over 40 years at the University of Nairobi, relatively few learners had completed their programmes through this mode, as compared to the conventional face to face mode.

However, and more specifically in line with the objective of this study, learning management systems (LMSs), are critical in online learning environments. This is because the LMSs essentially entail the use of certain technological components which constitute part of the software for enabling effective delivery of educational content. Arguably, one of the pivotal enablers of successful learning in the said environments consists of strategically chosen LMSs which facilitate the key activities involved in the teaching-learning process.

This is because the LMSs are supposed to seamlessly support the essential content organization and delivery, which in turn promotes effective communication between teachers and learners, when, and as required.

Indeed, as Bradley (2020) reiterated, a learner-fit LMS reinforces the basic classroom-based interactions by providing a supportive learning and teaching engagement. Hence, there is little doubt, if any that, as one of the key components utilized for effective transmission of educational content, the LMS is invaluable, in determining the level of achievement of learners' academic progress. Therefore, the extent to which all providers of learning through distance learning modalities strategically leverage, or otherwise, on a well thought out learning management system, duly becomes a critical factor calling for commensurate scrutiny. This is especially because, a well-designed, accessible and reliable learning management system enables both the learners and the teachers, not only to carry out their need-specific activities, but also to gain from a teaching-learning environment that motives everyone, towards the envisaged progress and success (Kasumu, 2022).

The case for the centrality of LMSs in distance learning, as compared to conventional face to face learning, is perhaps most appropriately illustrated by the comparative advantages and disadvantages of both. For instance, it has been pointed out that the main disadvantage of distance learning is the inherent absence of direct face-to-face interacting between learners, as well as between the instructors and the learners, which often results in a degree of isolation, diminished motivation, and possible poor performance for both (Ustun, Karaoglan & Yilmaz, 2021).

It is in this contextual circumstances that LMSs become critically value full for distance learners because, LMSs facilitate availability and access to the courses content, and in the process, provide the amenities by which the instructors as well as the providing institutions promote, energize, and motivate learners towards engagement and participation. Similarly, LMSs enabling the essential collaboration, and continued evaluation of academic progress, (Bradley, 2020. Arguably, therefore, LMSs enhance the essential equivalence in delivery, where the distance learners, as enabled by LMSs, are able to equally, if not better, interact with their instructors, and the providing institutions, just like their counterparts in face to face learning mode.

Yet, relevant empirical literature addressing the usage of LMSs in distance learning appears limited. This is in spite of the increasingly myriad of challenges and drawbacks, which have been found to compromise distance learners, particularly with regard to high attrition rates. Indeed, no study appears to address this in the context of LMSs in distance learning, as practices by public universities in Kenya. The outcome of this study potentially presents an opportunity for documenting useful empirical findings, which may aid decision makers, policy formulators, practitioners, and most importantly, distance learners, as the consumers of distance learning programmes, not only in Kenya, but also worldwide.

LITERATURE REVIEW

The Equivalence Theory of Distance Learning posits that there is a marked difference between technologies mediated learning, and face to face learning (Keegan, (1995). The latter, according to Keegan (1995), does not necessarily involve the use sophisticated, and, or innovative technologies, if any. In this context, the equivalence theory suggests the need for strategic preparation, to ensure equivalence, regardless of mode of learning used (Simonson, 1999). Epitomizing the need to strategically cater for distance learners according to their unique needs, this theory resonates with this study.

This is because, by providing suitable LMSs, distance learning courses providers are able to cater for the many aspects which are called for, in catering for effective learning for the distance learners, equivalent to similar aspects for the face-to-face learners. Therefore, this study's outcomes potentially render credence to the Equivalence Theory. As conceptualized in this study, the relevant literature review variously revealed the importance of the learning management system in catering for distance learners' academic progress. Garcia, Abaratigue, & Alcantara (2021), used a pretest-posttest quasi-experimental normative survey design, in a Technology College in Philippines. They found that the use of LMSs generated optimistic learner attitudes towards learning, and teaching, thereby affecting their academic performance. The current study investigated the same, using a descriptive survey, in a mixed qualitative-quantitative mixed approach. Moonsamy & Govender (2018), using a descriptive survey, studied the use of Blackboard Learning management system, at a South African university, and established that a supportive learning management system, caused a marked inclination towards using such environments by learners, who were, therefore, able to enhance their academic progress.

However, Moonsamy & Govender (2018), concentrated on BlackBoard LMS. The current study investigated a list of seven LMSs, including BlackBoard. Similarly, Chigozie-Okwum, Ezeanyeji & Odii (2018), using a descriptive survey design, studied the adoption of learning management systems in Nigerian tertiary institutions. They found that low and slow adaptation to the learning management systems, difficulties in mainstreaming relevant courseware onto the learning management system erratic or unreliable electricity flow, and that there was low willingness or enthusiasm to adopt to the learning management infrastructure by faculty and learners, all of which do hampered learners' academic progress. Notably, Chigozie- Okwum et. al. (2018), seem to focus on attitudes towards adoption, while the current study focused on the extent to which the implemented LMSs were accessible, efficient, and reliable.
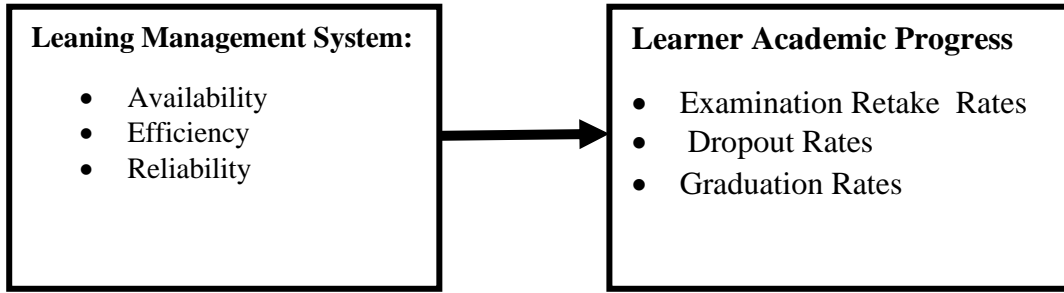
In Kenya, Araka, Maina, Gitonga, Oboko & Kihoro (2021), studied university students' perception on the usefulness of learning management system towards promoting their own learning. They used a structured survey design and found that not only did the learners fail to adequately utilize the tools accorded by the learning management system, but also that the leaners faced serious hindrances which obstructed them from being actively engaged in digital learning, thereby compromising their progress. Although Araka, Maina, Gitonga, Oboko & Kihoro (2021) measured related aspects of LMS as in the current study, the later assessed the use of LMSs in general, rather than the seven typical LSMs examined in the current study.

 From the foregoing empirical literature review, one is easily persuaded that increasingly, it is evident that learning management systems are essential in distance learning, especially where technology-aided distance learning is the main mode of transmitting learning programmes. However, the degree to which universities in Kenya, for instance, have been utilizing learning management systems to strategically address learners' needs does not appear to be adequately addressed. This is particularly with regard to the evidenced challenges facing distance learners, especially with regard the increasing attrition in for of dropout rates. As far as the current study is concerned, the current literature reflects a dearth, in terms of addressing the plight of distance learners, vis-a-vis the myriad of challenges they increasingly face, the challenges of which are substantially exacerbated by insufficiently available, inefficient, and unreliable LMSs, as investigated in this current study.

In this regard, no study seems to have addressed the use of LMSs, especially with respect to the extent to which the said systems may be responsible for hampering distance learners' academic progress in Kenya's public universities, and indeed, all other institutions transmitting educational content through online modalities. Figure 1 illustrates the conceptual framework of the study.

INDEPENDENT VARIABLE

DEPENDENT VARIABLE

Leaning Management System:	Learner Academic Progress
• Availability • Efficiency • Reliability	• Examination Retake Rates • Dropout Rates • Graduation Rates

Source: Research Concept (2023)

Figure 1: Conceptual framework

As illustrated in Figure 1, literature reviewed revealed that online educational courses and programmes ought to be strategically packaged and delivered through learner-sensitive learning management systems. The LMSs enable learners to access, and use the systems at their convenience. In general, typical LMSs in use by providers include; ATutor, Blackboard, Moodle, Schoology, Edmodo, Tovuti LMS, and Canvas. In the light of the substantial empirical evidence pointing to increasing attrition rates in distance learning programmes, on the one hand, and the dearth of relevant literature addressing the potential critical function of learning management systems in enabling learners' academic progress the other, this study arose. The study evaluated the extent to which these learning management systems were sufficiently availed, sufficient, and reliable, in supporting learners taking their courses in the public universities in Kenya. Hence, the extent to which the LMSs, (the independent variable), influenced academic progress of distance learners (the dependent variable), as indicated by examination retake rates, dropout rates and graduation rates was examined.

RESEARCH METHODOLOGY

This study was guided by the Pragmatic paradigm, which, according to Kaushik & Walsh (2019), proposes that researching as an undertaking is better conceptualized through considering the fact that, there may exist singular as well as multiple realities for empirical investigation (Creswell, 2011). A descriptive survey design enabled focused collection of data from the population, describing the variables as they were (Mugenda and Mugenda, 1999). Eight public universities were purposively selected, based on empirical evidence that, by 2016, very few public universities provided programmes on distance learning using special open, distance and e-learning (ODeL) centers, which uniquely presented distance learning-fit infrastructure (Nyerere, 2016). This population amounted to approximately 17,488 distance learners. Table 1 illustrates.

Table 1: Target Population

UNIVERSITY	TOTAL LEARNER ENROLMENT (2016)
University of Nairobi	10000
Kenyatta University	3998
Jomo Kenyatta University of Agriculture & Technology	500
Masinde Muliro University	540
Maseno University	200
Multimedia University of Kenya	400
Karatina University	200
Moi University	400
TOTAL	**17488**

Note; table 1 sourced from Nyerere (2016), Open and Distance Learning in Kenya, A Baseline Survey Report Commissioned by The Commonwealth of Learning page 26-46 https://oasis.col.org/server/api/core/bitstreams/e8f3e16d-dd4c-4c41-8f52-60d2be9a0902/

Hence, a combination of purposive and quota sampling approaches was considered appropriate in this study, to allow deliberate choice of the units of observation that would enable study-specific determinable traits according to the objectives of the study (Ogula, 2005).

Therefore, from the 17488 distance learners of the eight public universities targeted, the top two on the list depicted on the above table, were purposively selected.

This was based on the fact that, the eight enrolled the largest number of distance learners were purposively selected. This was determined to constitute a manageable sampling frame of 13998 distance learners from the two universities, that is, the University of Nairobi and Kenyatta.

At a confidence level of .05, a margin of error of 0.05 and a population proportion of 0.7%, the sample size calculator gave a value of 98, rounded off to approximately 100, which meets an acceptable standard threshold (Taherdoost, 2016). Eventually, a relatively high student-populous undergraduate course in each of the two universities, in this regard, the B.Ed. (Arts) cohort 2018/2019 academic year in both universities were selected to be the respondents.

Two quotas were determined in the sample of 100 B.Ed. (Arts) distance learners; one for each of the University of Nairobi and Kenyatta University respectively.

The number of respondents in each quota was determined proportionately, based on the total of enrolled distance learners in the two universities. Therefore, for University of Nairobi, which enrolled 381, and Kenyatta University which enrolled 522 learners, each quota had ((381/903)) % = 42); and ((522/903)) % = 57), respectively. Table 2 illustrates.

Table 2: Sample Distribution

University	Total B.Ed. (Arts) Enrolment (2018/2019)	Percentage Proportion
UON	381	42
KU	522	58
TOTAL	**903**	**100**

Source: Research Design (2023)

Consequently, a mixed method approach constituting quantitative as well as qualitative data was used, where self-administered questionnaire was designed for collecting quantitative and qualitative data. A document analysis and observation guide was used as a means of enabling triangulation, and hence enable the study to delve deeper into the phenomenon at hand.

Piloting of the instruments enabled a keen checking by supervisors, content experts and supervisors. For this purpose, a separate random sample of 38 (10% of actual sample size) enabled achievement of the basic normal distribution theorem threshold (Lyon, 2013).

Cronbach's (1951) formula was used, aiming to achieve a test-retest reliability coefficient alpha of at least a threshold of 0.75 between T1 and T2 for each individual score in the sample. Collected data was grouped and analyzed using descriptive statistics and inferential statistics, at a significance level of 0.05, for the rejection or

otherwise of the null hypothesis. The model used for this analysis was $Y = \beta_0 + \beta_1 X_1 + e$, where Y = learners academic progress, β_0 = constant, β_1 = Beta coefficient, X_1 = learning management system, and e = error term.

Table 3: Responses on Availability of LMS

LMS Type	Frequency	Percent	Valid Percent	Cumulative Percent
Tutor	12	15.6	15.6	15.6
Moodle	37	48.1	48.1	63.6
Schoology	2	2.6	2.6	66.2
Edmodo	0	0	0	66.2
Tovuti	1	1.3	1.3	67.5
None of the above	7	9.1	9.1	76.6
not sure	18	23.4	23.4	100
Total	**77**	**100**	**100**	

RESEARCH FINDINGS AND DISCUSSION

Various diagnostic tests were undertaken to test for the assumptions of inferential statistics and regression towards ensuring that the collected data was fit for analysis and the subsequent findings: The Cronbach Alpha Coefficients (Ehlers and Clerk (2000) for the independent variable, online learning management system, showed coefficient of .82, which was above 0. 6, implying that the instrument was sufficiently reliable for further analysis. A Linearity test using Pearson Correlation Coefficient showed that the independent variable and dependent variable were largely linear, with a $P > .05$ in each case (Field, 2009). A Multicollinearity test (Kothari, 2009), showed that both the independent and the dependent variables had tolerance values above the acceptable minimum limit of 0.1 (Senaviratna & Cooray, 2019). Likewise, a Kaiser-Meyer-Olkin (KMO test (Field, 2009), indicted 0.723, higher than the 0.6, but less than 1, indicating a good threshold as recommended by Field (2009).

Descriptive Statistics Results on LMS and Learners' Academic Progress

The objective of this study was to determine the influence of learning management system on academic progress of distance learners in public universities in Kenya. Based on the two indicators used to examine LMS; availability, and efficiency/reliability, the responses on the two   questions posed to the respondents respectively are presented herewith:

Q1: Availability of LMS

The respondents were asked to indicate on a dropdown list of typical learning management systems used in distance learning environments, the LMS available in their university. Table 3 illustrates the responses.

Source: Research Data Analysis (2023)

As depicted on Table 3, a majority of respondents (48%), indicated that Moodle was available in their universities. Interestingly, Edmodo, one of the popular LMSs seemed not exist, with TOVUTI available to only one respondent, which was interesting because any of the respondents is in a university with others, not alone. It was also interesting that 23% of the total respondents were unsure of any of the LMSs, not to point out the 9% who indicated none of the LMS listed existed! Therefore, and based on these responses, one may conclude that there is uncertainly, bordering on confusion, regarding the usage, availability, and most likely accessibility and reliability of learning management systems in the public universities. This is because, even Moodle LMS, which, based on observational anecdotal evidence, is the most commonly used in the public universities as asserted by Mwangi, Imonje and Kalai (2023), had only 48% acknowledging its existence!

Q2: Efficiency and reliability of LMS

Responses were asked to indicate yes or no with respect to the extent to which they perceived that the LMSs in use at the respective universities were efficiently and, therefore, reliably serving them appropriately towards enabling them to progress through their courses. Table 4 summarizes the responses

Table 4: Efficiency of LMS

Responses	Frequency	Percent	Valid Percent	Cumulative Percent
yes	32	41.6	41.6	41.6
no	45	58.4	58.4	100
Total	**77**	**100**	**100**	**100**

Source: Data Analysis (2023)

As illustrated in Table 4 almost a similar number 42%, versus 58% did perceive the LMS in use as efficient. It would appear, based on this finding, that the LMSs in use at the two universities, and most likely, all the other public universities were not as value-adding as expected, with regard to aiding distance learners efficiently and reliably progress through their programmes. Importantly, however, a majority 58%, did not perceive that the LMS in use was efficient. This finding seemed to be supported by empirical literature, for instance, Chigozie-Okwum, Ezeanyeji & Odii, (2018), who found that there were many challenges with the use of LMS, including power flow consistency, affecting uploading of courseware, which caused inefficiencies, thereby making the LMSs unreliable in supporting effective learning.

Q3: Qualitative Responses on Contribution of LMS on Academic Progress

This indicator was designed to be a means of comparing the results of the quantitative data analysis obtained under Q1 and 2 above, to enable the needful triangulation between the quantitative analysis and the qualitative analysis**.** In this respect, an open-ended question to the respondents, asking them to state, in their opinion, the extent to which the LMSs in their university had been useful in helping them progress through their courses. Table 5 presents a sample of the responses.

Table 5: Qualitative Responses on Contribution of LMSs to Academic Progress

does not really work
50 50
may be sometimes
not sure
It has been useful
Yes
It has been useful with the help of the lecturers
Yes. the LMS enabled interactive lessons without necessarily moving . this save on cost of movement and accommodation hence education is more affordable
Not really.
It is fair.
Yes very helpful
Yes

Source: Data Analysis (2023)

From Table 5. Showing the extracted sample of responses, it was evident that whereas many respondents indicated to the affirmative, ranging from yes, quite useful, and so on. However, a comparatively larger majority (55%) indicated to the contrary, mainly indicating no, not as helpful, needs drastic improvement, and so on. From this analysis, this finding seems to affirm the earlier quantitative descriptive findings in Q1 and Q2.

Descriptive Statistics on Learners' Academic Progress

The independent variable, learners' academic progress, consisted of constructs which were conceptualized as representative of appropriate indicators which may help respondents provide relevant data.   These indicators were; examination retake rate, student dropout rate, and student graduation rate. Three questions were posed, and the results are presented and discussed respectively..In the first question, the respondents were asked, using two statements, to indicate their perception on the extent to which they felt supported academically. Table 6 presents the results

Table 6: Descriptive Statistics on Extent of Support for Academic Progress

Indicator Statement		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Learning has generally been smooth and mainly trouble-free, with good progression since the start.	22	28.5	28.5	28.5
	I have found my progress full of hurdles, and, so far, I am not making much, if any progress at all	55	71,4	71.5	100.0
	Total	77	100.0	100.0	

Source: Research Data (2023)

From Table 6, approximately 29% of the respondents indicated that learning had been smooth and mainly trouble-free, with good progression since they started. However, on the same statement, a majority of approximately 71%, indicated to the contrary.

They indicated that they had found their progress full of hurdles, and had not made much, if any progress at all. The finding was, therefore, that the majority of the respondents were troubled, as far as their academic progress was concerned. The second question asked the respondents to rate the number of examinations retakes they had taken, using a scale made up of very many, many, just a few, very few, and non. The results are presented on Table 7.

Table 7: Descriptive Statistics on Examination Retake

Indicator		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	very many	35	45.5	45.5	45.5
	many	4	5.2	5.2	50.6
	just a few	15	19.5	19.5	70.1
	very few	15	19.5	19.5	89.6
	none	8	10.4	10.4	100.0
	Total	77	100.0	100.0	

Source: Research Data (2023)

From Table 7, approximately 46% had taken very many retakes, 5% had retaken many, approximately 20% very few, and a similar number as well, had retaken just a few. 10%, had not retaken any examination. Based on these findings, except for the 10% of the respondent learners, who had not had to retake any examination, all the rest

92%, had had to do so. Hence, the possibility that these majority, were hampered in terms of progressing in their courses was evidently real.

On the third question, the respondents were yes or no to knowing a colleague who had since dropped out of the course or deferred? The results are presented on Table 8

Table 8: Descriptive Statistics on Dropout Rate

Response		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	51	79.2	79.2	79.2
	No	16	20.8	20.8	100.0
	Total	77	100.0	100.0	

Source: Research Data (2023)

As shown on Table 8, 79% indicated yes, while 21% indicated No. A majority, therefore, knew colleagues who had dropped out. On this finding, it can be evidently construed that dropout rate seems to hamper distance learners. The extent to which this dropout rate is brought about by the shortcomings in the learning environment, within which LMSs are key contributors in facilitating academic progress, is a matter of empirical concern in this study, and so far, and subject to the forthcoming regression analysis, it appears evident, going by this finding, that distance learners' academic progress is hampered, as indicated by the excessive dropout rate.

The last question, used a five level Liker type scale, to aid the respondents indicate, whether or not, they believed that they were on course for graduation, as planned. The results are presented on Table 9.

Table 9: Descriptive Statistics on Graduation Rates

Indicator	SA (%)	A (%)	NAND (%)	D (%)	SD (%)	Mean	SD
So far and as far as I know, I and my colleagues graduated/will graduate on time as planned	13	16	17	44	10	2.77	1.22

Source: Research Data (2023)

The results from Table 9 indicate that in total, 29% of the respondents agreed that they would graduate on time as planned. On the other hand, 71%, including those who neither agreed nor disagreed, disagreed, while the rest were not sure. Hence, a majority of respondents negatively perceived the final step in academic progression, seeming to confirm, as conceptualized, and hypothesized in this, study, that, the plight of distance learners, with regard to academic progress was indeed, troubled.

Descriptive Qualitative Analysis Responses on Learners' Academic Progress

Finally, under descriptive analysis, and to provide supplementary triangulation of the quantitative analysis for dependent variable; learners' academic progress, qualitative data was collected, and analyzed using a document analysis and observation guide, through which data on dropout and graduation rates during 2018/2019 academic year, was collected physically from the respective departments of the universities sampled. Table 10 presents the results.

Table 10: Physical Records of Dropout and Graduation Rates

University	Enrolment	Not Completed or Dropped Out	Graduated
UON	381	220	161
KU	631	219	412
TOTAL	**1012**	**439**	**573**

Source: Research Data (2023)

From Table 10, the data collected showed that, in both universities, the number of distance learners who graduated was drastically less than those who had enrolled during the 2018/2019 academic year. At the University of Nairobi. 220 learners, representing 42% were either still stuck with their programmes, or had possibly dropped out, now that they did not graduate by 2022. Likewise, At Kenyatta University, approximately 35% of the learners did not graduate as scheduled, and most likely, many of these may have actually dropped out. It is important to note that, getting the figures as recorded for the enrolment and graduation involved various offices and officers at both universities. In some cases, the figures given differed from office to another.

Secondly, the figure given as dropout for both universities may also have included those who had deferred or delayed graduating for one reason or the other. However, there is little doubt that the number of learners who graduated in each university, was markedly less than those who had enrolled. As far as this study was concerned, this finding references an impediment to learners' academic progress, and, therefore, qualitatively affirms the quantitative findings made under the dependent variable.

Inferential Statistics Results

The objective of this study was to determine the extent to which learning management system influences the academic progress of distance learners in public universities in Kenya.

To achieve this objective, a null hypothesis; learning management system does not influence distance learners' academic progress, was tested using simple linear regression analysis. The model which was used for linear regression was $Y = \beta_0 + \beta_1 X_1 + e$, where Y = learners' academic progress, β_0 = Constant, β_1 = coefficient of the independent variable (Courseware), X_1 = learning management system, and e = error term. The results of the regression analysis, based on the objective, and hypothesis, are presented on Table 11.

Table 11: Results of Regression Analysis of Influence of LMS on Learners' Academic Progress

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	
1	0.264	0.07	0.507	1.18801	
ANOVA:					

Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.939	1	7.939	5.625
	Residual	105.853	75	1.411	
	Total	113.792	76		
Coefficients:					

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta		
1	(Constant)	3.393	0.297		
	x1	-0.202	0.085	-0.264	

Source: Research Data Analysis (2023)

Deducing from Table 6, the adjusted R square was .507, implying that there was a fairly strong relationship, where learning management system seemed to account for approximately 51% of the change in the academic progress of distance learners in public universities in Kenya. The $F_{(1, 75)}$ statistics was 5.625 with a P-value .0001 (P value < 0.05). Likewise, the Beta coefficient for learning management system was -202, with P-value at .0201 (P-value < 0.05). This implied that the other 49% of the change in the dependent variable that is academic progress of distance learners was caused by other factors other than the learning management system.

The other implication was that the null hypothesis was rejected, and, therefore, the alternative hypothesis was accepted, finding that learning management system had a positive, statistically significant influence on the academic progress of distance learners in public universities in Kenya. This meant that any unit change in learning management system was likely to cause a corresponding 50% change in the learners' academic progress.

This finding is consistent with relevant empirical literature reviewed. For instance, Chigozie-Okwum, Ezeanyeji & Odii, (2018) found that low and slow adaptation to the learning management systems, difficulties in mainstreaming relevant courseware onto the learning management system, erratic or unreliable electricity flow adversely affected learning delivery. Likewise, Moonsamy & Govender (2018), established that there was a relationship between a supportive LMS-supported learning environment and increased inclination towards usage of LMS environments by distance learners. It is important to note, however, that Chigozie-Okum et. al. (2018), and Moonsamy & Govender (2018), were contextualized in Nigeria and South Africa respectively, rather than in Kenya, and hence the potential value in this study, which localized the context, and extended the same to the wider empirical literature perspective.

CONCLUSION

On the basis of the objective and hypothesis, and the respective findings of this study, it is concluded that the learning management system, as indicated by availability, efficiency and reliability, has a positive and statistically significant influence on the academic progress of distance learners in public universities in Kenya. Hence, all the providers of academic programmes using distance learning methodologies, as well as associated decision makers in the public and private education sector, need to take note, and strategically consider the possibility of leveraging on these findings. More importantly, the public universities in Kenya, which are providing programmes using distance learning mode, are, by virtue of these findings, called to action accordingly. This is mainly because, the universities' actions towards enhancing the learning environment in terms of availability, efficiency and reliability of the critical LMSs, would greatly enhance academic achievement of the distance learners' community.

RECOMMENDATIONS

This study recommends that the universities ought to be more strategic, and creative, in providing a learning environment which are need-specific for distance learners.

The policy makers, including the stakeholders and players in the education sector, the government and associated agencies need to either redesign, or if need be, formulate and drive the the implementation of new, distance-learning suited policy framework. This policy should address the provision of a technology-compliant infrastructure, encompassing relevant LMSs and the associated other amenities. Armed with such a policy, but non-the-less creatively and innovatively, public universities in Kenya, need to act in tandem.

The universities, and in deed, all other institutions across the world, offering educational programmes using online or distance learning oriented modalities, should ensure that the implementation of distance learning programmes is not only in tandem with government and stakeholder policy, but that distance learners` academic prospects are the driving concerns during such implementation. The public universities ought to be more strategic, therefore, and, as the essential providers, make the relevant interventions as a matter of urgency. For instance, the universities should undertake rigorous LMSs-oriented training of faculty as well as learners, including the all-important orientation of learners at the start. It would also help a great deal, to provide

systematic improvement-driven evaluation of the LMSs, to facilitate timely solutions of technological and other arising problems on-the-go. Needless to over-emphasize, these and more interventions would foundationally addresses the needs of distance learners, in terms of availability, efficiency and reliability of the LMSs, thereby sustainably enabling adequate support for the academic quest of distance learners.

Most importantly, this would promote the prospects of such learners, in terms of less, if not eliminated examination retake rates, lowered dropout rates and higher graduation rates. Furthermore, revitalized provision of learning and teaching LMSs would enhance the growth and flourishment of distance learning as a mode of educational transmission, alongside the traditional face to face learning. Ultimately, the users of all forms of online learning, who mainly constitute distance learners, should find the outcomes of this study useful, especially in terms of reducing, if not eliminating the deficiencies occasioned by compromised availability, inefficiency, and unreliable LMSs.

AREAS OF FURTHER STUDY

Further and confirmatory studies on the learning management system, and related topical themes, may help to affirm or otherwise, the results of this study. In addition, it would be interesting to compare the findings of another study using the same variables, but this time, to focus on private rather than public universities in Kenya.

REFERENCES

1. Araka, E., & Maina, E., & Gitonga, R., & Oboko, R., & Kihoro, J. (2021). University students' perception on the usefulness of learning management system features in promoting self-tegulated learning in online learning. The International Journal of Education and Development using Information and Communication Technology. 17. 45-64. https://www.researchgate.net/publication/348962345
2. Bradley, V. M. (2020). Learning management system (LMS) use with online instruction. [IJTE]. International Journal of Technology in Education, 4(1), 68–92. https://doi.org/10.46328/ijte.36
3. Chigozie-Okwum, C., Peter, E., & Odii, J. (2018). Adoption of learning management systems in Nigerian tertiary institutions: Issues and challenges. International Journal of Computer Applications, 181, 5–. https://doi.org/10.5120/ijca20189181
4. Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. Psychometrika, 16(3), 297–334. doi:10.1007/bf02310555.
5. Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. behaviour research and therapy, 38(4), 319-345. doi: 10.1016/s0005-7967(99)00123-0. PMID: 10761279.
6. Field, A. P. (2009). Discovering Statistics using SPSS. 2nd Ed. London: Sage. Retrieved from: http://erepository.uonbi.ac.ke/bitstrea m/handle/11295/101968/
7. Garcia, R. E., Abaratigue, A. M., & Alcantara, N. V. (2021). Integration of learning management system as an aid in teaching: An assessment. European Journal of Educational Research, 10(4), 1907-1918. https://doi.org/10.12973/eu-jer.10.4.1907
8. Govender, I., & Govender, D. (2012). A constructivist approach to a programming course: Students' responses to the use of a Learning Management System. African Journal of Research in MST Education, 6(2), 238–https://doi.org/10.1080/10288457.2012.10740742
9. Kasumu, R. (2022). Learning management system in education: benefits and drawbacks. International Journal of Trendy Research In Engineering And Technology. 07. 17-23. 10.54473/IJTRET.2022.7103.
10. Kaushik, V., & Walsh, C. A. (2019). Pragmatism as a research paradigm and its implications for social work research. Social Sciences, 8(9), 255. https://doi.org/10.3390/socsci8090255readiness
11. Keegan, D. (1995). Teaching and learning by satellite in a European virtual classroom. In F. Lockwood (Ed.), Open and Distance Learning Today (pp. 108-117). London: Routledge
12. Kisimbii, Gakuu and Kidombo (2019). Technological support services and retention of online learners: A case of education programmes of the University of Nairobi. Journal of Research & Method in Education (IOSR-JRME) e-ISSN: 2320–1959.p-ISSN: 2320– 1940.
13. Kothari, C. R. (2004). Research methodology: methods and techniques (2nd Ed.). https://www.cusb.ac.in/images/ cusb- files/2020/el/cbs/MCCOM2003C0

14. Mbugua, J., Bowa, O., Gakuu, C., & Mboroki, G. (2018). Awareness as a determinant for education managers' support for distance learning mode of instructional delivery. The case of Western Region Kenya. 25-40. https://www.researchgate.net/publication/327043550

15. Moonsamy, D., & Govender, I. (2018). Use of Blackboard learning management system: An empirical study of staff behavior at a South African University. EURASIA Journal of Mathematics, Science and Technology Education, 2018, 14(7), 3069-3082 ISSN:1305-

16. Mugenda, O. M., & Mugenda, A. G. (1999). Research methods. Quantitative and qualitative approaches. ACTS Press. https://files.eric.ed.gov/fulltext/EJ941658.pdf

17. Mwange, E., G., Imonje, R., & Kalai J. (2023). Moodle satisfaction levels during online assessments in selected public universities in Kenya; International Journal of Science and Research (IJSR) ISSN: 2319-7064 SJIF (2022): 7.942.

18. Ndege, W, Ndiritu, A., Mwangi, A., & Gatotoh (2023). Learner academic support services and retention of students in open distance learning programmes: The case of selected universities in Kenya. 5. 122-139. https://www.researchgate.net/publication/375757865

19. Ngeze, Lucian. (2016). Learning management systems in higher learning institutions in Tanzania: Analysis of students' attitudes and challenges towards the use of UDOM LMS in teaching and learning at the University of Dodoma. International Journal of Computer Applications. 136. 9-12. 10.5120/ijca2016908560.

20. Ogula, P. A. (2005). Research methods. Catholic University of Eastern Africa Publications. https://www.academia.edu/25149760/

21. Olatunbosun, O. (2020). Influence of educational financing challenges on the enrollment, dropout and graduation ratios among students of distance learning education in National Open University Nigeria. International Journal of Academic and Applied Research (IJAAR) ISSN: 2643-9603 . 4, http://ijeais.org/wp-content/uploads/2020/8/IJAAR200811.pdf

22. Simonson, Michael. (1999). Equivalency theory and distance education. Techtrends. 43. 5-8. 10.1007/BF02818157.

23. Simpson, O. (2013). Supporting students for success in online and distance education' Routledge, NewYork. https://www.researchgate.net/publication/259384509/

24. Ustun, A. B., Karaoglan Y. F. G., & Yilmaz, R. (2021). Investigating the role of accepting learning management system on students' engagement and sense of community in blended learning. Education and Information Technologies, 26(4), 4751–4769. https://doi.org/10.1007/s10639-021-10500-8