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ENHANCING ACADEMIC PROGRESS OF DISTANCE LEARNERS THROUGH ONLINE LEARNING COURSEWARE DESIGN IN PUBLIC UNIVERSITIES IN KENYA.

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ABSTRACT

Distance learning, as a mode of educational delivery, continues to gain popularity worldwide. However, at the same time, it has been increasingly evident that in many instances, distance learners in various institutions of learning are hampered in terms of progressing and completing their studies as scheduled. It is in this context that this study was undertaken. The objective of this study was to determine the extent to which online learning courseware provided by learning institutions may influence the academic progress of distance learners in public universities in Kenya. Guided by the positivist paradigm and the equivalence theory, this study used a mix of quantitative and qualitative research approaches in a descriptive survey research design. A sample of 100 learners was drawn from 903 learners of the 2018/2020 cohort of distance learners in the B.Ed. Arts programmes from the University of Nairobi, and Kenyatta University.

Data was collected using a self-administered questionnaire, and a document observation guide. Descriptive and inferential statistics were used to analyze the data. A response rate of 77% was achieved.

Linear regression analysis showed that learning courseware had a statistically significant influence on academic progress of distance learners in public universities in Kenya, with a fairly significant adjusted r^2 = .334, at a P-value .0001 (P value < 0.05). The study concluded that online learning courseware, with respect to availability, relevance, and sufficiency, positively and substantially influenced distance learners' academic progress.

It was recommended that public universities ought to revitalize the implementation of distance learning programmes, and, by so doing, strategically ensure that the relevant courseware are available, and sufficient towards adequately supporting the learners' academic prospects. The findings of this study potentially add to the relevant empirical and theoretical literature with respect to the distance learning environment, and more specifically the learning management system as a key component of this environment. The findings may potentially serve as a point of reference in policy formulation and decision making by all providers of educational programmes through distance learning, related government agencies, and researchers.

Further comparative research on the same variables, probably incorporating a larger sample of public and private universities is recommended.

Key words: Learning environment, online courseware, academic progress, distance learners

INTRODUCTION

Distance learning as a mode of delivering educational content continues to increase in usage due to various factors, including the advent of Covid 19 pandemic. However, even as the uptake of distance learning as a mode increases, the extent to which learners in distance learning platforms are able to progress and complete their courses has been found to be variously troubled and challenged.

For instance, there evident increasing dropout rates, and hence, dwindling graduation rates in distance learning-oriented programmes, in Europe, the United Kingdom, and Africa, ranging from UK Open University, Athabasca, and University of South Africa (Simpson, 2012). Likewise, student dropout rate at Open University of Tanzania was said to rise with the enrolment rate, mainly because of several factors, including, inadequate technology-related learner support services. Similarly, 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.

The empirical literature seems to firm up the foregoing evidence. For instance, Situma (2015), underscored that there was insufficient investment in ICT infrastructure, no Government policy guiding distance learning as envisaged in the Sessional Paper 1 of 2005, high levels of ignorance on the part of consumers and distance learning provider institutions concerning distance learning as a mode of learning. Furthermore, according to Tarus, Gichoya and Muumbo (2015), poor ICT infrastructure as well as inexistent operating policy framework for delivering distance learning were hindrances to the delivery of online learning in public universities in Kenya. Indeed, as Mbugua, Bowa, Gakuu, & Mboroki (2018), asserted, although distance learning mode had been on in Kenya for over 40 years at the University of Nairobi, relatively few learners had completed their programmes through this mode.

More specifically for this current study, Abas, Osman, Kumar & Thangapragasam (2015), established that learning interface-oriented mediating courseware aided the achievement of learning goals and practically supporting distance learners in performing learning tasks which are essential in grasping concepts taught in distance learning environments.

This is because, as evidenced in theoretical and empirical literature, there are certain components which should be availed to learners, especially distance learners, to enable them successfully to undertake and complete their courses. In this regard, this study considered online courseware to be key, among other elements of the infrastructural facilities of which are needed by all distance learners.

However, in spite of the evident importance of the distance learning environment, and in particular, the needful online learning courseware, this study was concerned, and particularly addressed the discrepancy that, on one hand, the popularity and usage of distance learning as a mode of delivering educational content continues to grow, while, on the other, the consistency with distance learners' challenges and problems continue to hamper their academic progress as empirically evidenced should be a matter of great concern of for all stakeholders, especially the current and future distance learners.

Yet, the current empirical literature does not seem to specifically nor directly address the extent to which the courseware-specific learning environment among the other possible elements of the wider distance learning environment, may be partly responsible for the many challenges and problems which have, and continue to adversely affect distance learners' capacity to progress and complete their pursuits successfully.

LITERATURE REVIEW

The Equivalence Theory of Distance Learning was considered most relevant to this study. This theory posits that **t**here is a marked difference between technology mediated learning, as is the case with the distance learning form of instruction in comparison with the conventional face to face form of instruction, where the latter does not necessarily involve the use sophisticated and or innovative technologies, if any. In this context, the equivalence theory suggests the need for a unique and deliberate preparation, which would strategically ensure that regardless of mode of learning used, whether the traditional mode, or the remote mode, the learners' needs are catered for equally (Simonson, 1999). This proposition was earlier affirmed by Keegan's (1995) study, which proposed that teaching through online methods could enable virtual classrooms where it was possible to connect teachers to learners at varying locations.

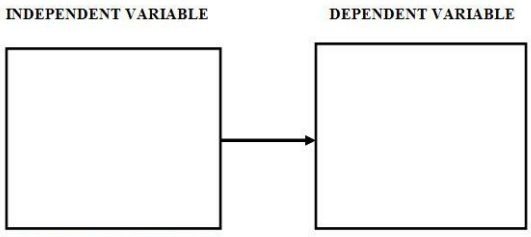
According to this theory, learning through distance mode ought to contextualize learning in terms of providing equivalent learner interventions, in such a way that the higher the equivalence of the learning interventions for the remote learners is in comparison to those of the traditional learners, so would be the common good for

both. Hence, there ought to be a deliberate provision of equal interventions for both categories of learners, even where there may be a need to address their respective unique needs. It is in this respect, that this study considered this theory relevant because the provision of potent distance learning environment, as conceptualized in this study, with emphasis on online learning courseware, is essentially such that equivalence is realized, to the greatest possible extent.

This is especially likely to be so especially where a blended approach to the delivery of learning, as is the case in almost all universities today. Both categories of learners, that is, distance learners (especially those on e-learning and mainly off-campus) as well as those mainly on-campus for practical oriented courses, are catered for equivalently.

One of the fundamental principles of the equivalence theory is that the mode of instruction, whether face to face or the mediated distance learning mode, ought not to influence the quality of students' learning experiences, This study strongly identifies with the equivalency theory by proposing that the learning environment of distance learning ought to be equivalent to that of face-to-face learning.

Hence, the mediating technologies which facilitate and enable distance learning, including the learning courseware used, ought to be provided for, bearing in mind this need for equivalency, towards serving the distance learners equivalently. The successful completion of this study may, therefore, significantly add to the credence of the equivalency theory. The conceptual framework of the study is illustrated below.



Source: Research Concept (2013)

Conceptual Framework

Source: Research Concept (2013)

Conceptual Framework

The empirical review for this study revealed that educational courses and programmes of study represent packaged courseware, a composite term combining "course" with "software". The term courseware, therefore, refers to any software built with materials to educate and or materials to transmit teaching strategies (Alessi & Trollip, (2001). Online learning courseware may, therefore include downloadable documents, instructional Video files, quizzes, and various forms of interactive tailor-made discussions which facilitate student-student, as well as student-teacher interaction.

Courseware has been traditionally applied in describing additional teaching requirements to aid facilitators, which was normally put together to be used with or alongside a computer system. Today, new learning technologies have been applied for developing multimedia-based instructional design techniques.

These mainly involve the analysis, design, development, implementation and evaluation by courseware designers and or educators ((Sözcü & İpek, 2015) citing (Lee & Owens, 2005). New instructional applications have emerged, with new instructional technologies and computers. For instance, systems enabling teaching, presentation of data by combining other systems with learner focused aids, like computerization, whiteboards and projecting devices to create interrelating systems. With regard to courseware application currently, there are several distance education tools in use including e-learning and other technologies to replace the traditional instructor and chalkboard (İpek & Sözcü, 2012). This new courseware enables learners to handle activities requiring presentation.

Most pertinently for this study, research regarding online courseware's effect upon the learners' prospects, specifically in terms of academic progression, does not appear to feature much, if at all, in the current empirical literature, except indirectly.

For instance, Abas, Osman, Kumar & Thangapragasam (2015), established interface-oriented mediating software as being able to remarkably aid the achievement of learning goals and practically supporting other media in use in distance learning environments.

As much as the software in use in a learning management system is a major component in aiding distance learning, it is only as useful as the online course components provided in the course of delivering content to distance learners. Yet, in Kenya, as an example, it was established that courseware development for distance learners was hampered by many challenges associated with insufficient internet connectivity, lack of computers, insufficient laboratories, limited instructional ICT skills (Makokha & Mutisya, 2016).

They recommended the universities ought to invest appropriately in the development of e-learning content among other elements. This would enhance the plight of learners towards effective learning and due advancement in their studies. From the foregoing, it is evident that courseware is essential in distance learning, especially as a tool towards promoting effective learning for smooth progression in their studies.

The empirical literature reviewed in this study, though relevant and very useful and informing and guiding this study, did not directly address online learning courseware, especially as contextualized in this study. For instance, Mutisya & Makokha, (2016), found that insufficiency in internet connection, lack of computers and related facilities, limitation in ICT oriented skills, and insufficient time allocation for online interaction with studies were key in hampering distance learning. However, although Mutisya & Makokha's (2016) study implied online learning courseware, they did not specifically address it. Likewise, Abas, Osman, Kumar & Thangapragasam (2015), established that interface-oriented mediating software was key in enabling achievement of learning goals and practically supporting other media in use in distance learning environments, they did not address the matter of online learning courseware, in terms of its availability and sufficiency as contextualized in this current study.

The increasing usage of innovative technology-driven educational methodologies, as well as the advent of Covid 19 Pandemic, have increasingly added to the popularity and usage of distance learning (Maheshwari, 2021). However, distance learners seem to be a troubled lot, experiencing many challenges and problems, as evidenced by slowed progression, as well as increasing dropout rates (Duman, 2023). Simpson (2014). Moreover, Musingafi, Mapuranga, Chiwanza & Zebron (2015), established that distance learners experienced a myriad of challenges, in the course of studying, ranging from insufficient study time, limitations in accessing and using technology, and insufficiency of studying materials. Mkwizu & Ngaruko (2020), established that many distance learners in Tanzania abandon their studies midway, adding that dropout rate at the Open University of Tanzania, for instance, was found to rise with the enrolment rate, mainly due to technology-oriented support services. Likewise, Kisimbii, Gakuu and Kidombo (2019), established that in spite of exerted efforts towards increasing the rates of retaining and graduating learners at the University of Nairobi, the graduation rates among the distance learners remained low.

However, of particular concern for this current study, is that the empirical literature reviewed does not seem to address or point to the relevance of the distance learning environment, as conceptualized in this current study, particularly with respect to online learning courseware in addressing the challenges, and the eventualities of compromised academic progress, including delayed completion, and excessive dropout rates.

Indeed, the extent to which the availability, the relevance and the sufficiency of appropriate online learning courseware, including downloadable documents, instructional Video files, quizzes, and various forms of interactive tailor-made discussions does not seem to have been addressed by any of the studies reviewed. This current study, therefore, is potentially useful in providing new insights, as well as new information which may aid stakeholders with regard to successful implementation of distance learning.

RESEARCH METHODOLOGY

As thresholds which have basic effect on research, paradigms are essential in determining the appropriate method to be applied in investigative engagements (Morgan, 2007). This study is predisposed towards the pragmatism paradigm, which, according to Kaushik & Walsh (2019), proposes that rather than be tied in the metaphysical concepts of truth and reality, researching may be better conceptualized in the sense that there may exist singular as well as multiple realities which may be available for empirical investigation, as asserted by Creswell and (2011), who pointed out that as much as there exists objective reality outside of human experience, such reality is often founded in the environment, is mostly encountered through such human experience.

This paradigm was considered most relevant for this study because, as opined by Gray and Webb (2013), it is not easy to conceptualized and understand individual behavior fully away from giving consideration to the varying interacting factors arising from their environmental factors. This study intends to investigate the learning environment, and, therefore, considers the pragmatic paradigm as one which presents the approach and contexts likely to be beneficial in promoting the realization of the pragmatic outcomes.

This study used a descriptive research design in a census approach. The study aimed at determining what existed according to the variables in question (Glass & Hopkins, 1984). As exemplified in the objective, and the hypothesis, the study made inferences beyond the data collected, to describe events and arrange them in logical themes. Not only did this enable the description of the existing phenomenon (Borg & Gall, 1989), but it also enabled the study to ontologically establish what needed to be known about the online learning courseware-academic progress interaction.

The effects of Covid 19 pandemic on educational offerings, meant that virtually all the universities in Kenya could be considered to be offering their respective programmes using some form of distance learning, or at least, using a blended approach where both modes of learning were used simultaneously. It is in this context that the target population of this study was determined. To enhance representativeness yet ensure that a manageable sample of the target population was selected.

Hence, eight public universities were selected, based on empirical evidence that, as of 2016, these universities were the few that provided programmes on distance learning, using special open, distance e-learning (ODeL) centers, which presented characteristic distance learning mode infrastructure (Nyerere, 2016).

This population amounted to approximately 17,488 distance learners. It was considered that these universities would present a close-to ideal environment, with features which would promote the extent to which there would be a more focused, thorough and relevant investigation of the phenomenon in question, in this case, a typical distance learning environment as conceptualized in this study. The following table illustrates the target population.

TARGET POPULATION.

NO.	UNIVERSITY	TOTAL LEARNER ENROLMENT (2016)
1	University of Nairobi	10000
2	Kenyatta University	3998
3	Jomo Kenyatta University of Agriculture And Technology	500
4	Masinde Muliro University of Science and Technology	1950
5	Maseno University	540
6	Multimedia University of Kenya	300
7	Karatina University	200
8	Moi University	400
	TOTAL	**17488**

Source: Nyerere (2016)

A combination of purposive and quota sampling approaches was considered appropriate in this study. This is because, the approach allowed for the deliberate choice of the units of observation that would enable respondents to be selected based on the determinable traits according to the objectives of the study (Ogula, 2005). This way, the eventual unit of analysis would adequately represent the larger population (Davis, 2005; Taherdoost, 2016).

Hence, from the 17488 distance learners of the 8 public universities targeted, the top two on the list depicted on the above table, which enrolled the largest number of distance learners were purposively selected and determined to constitute a manageable sampling frame of 13998 distance learners from the two universities, that is, the University of Nairobi and Kenyatta

University. Hence, 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). Further, to enhance focus and specificity as drawn from the objectives,, purposive sampling was used to select a common, and 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. This was so that the investigation can be confined to the critical mass of students where the variables being measured were likely to be rampant. Consequently, 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. The following table presents the sample size and how it was distributed in the two universities.

Sample Size Distribution.

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

Source: Researcher Data (2023)

Data from the respondents in research is collected using appropriate instruments to ensure adequacy and sufficiency (Kothari, 2004). This study used a questionnaire to collect both the quantitative as well as the qualitative data. A document review guide was also used to serve as a supportive, and confirmatory tool, to collaborate the data collected using the questionnaire, and hence, to an extent enhance the validity of the data collected as a result of enabling triangulation of the same.

According to Malmqvist, Hellberg & Möllås (2019), it is crucially important that researcher's pilot as a means of ensuring that they are more knowledgeable, better prepared for eventual constraints and more assured in the instrumentation process as well as in the data gathering. This enhances the quality of the process as well as the results. For this purpose, one university outside of the sampled two, but within the initially targeted eight, was picked at random from the list.

After the pilot, the instruments were keenly checked by supervisors and content experts and the recommended adjustments made to ensure relevance of content as well as the appropriateness of the items within.

To ensure that the research instruments were reliable, they were tested using a random sample of 1% of the main sample in each university. This equals a total of 38 respondents, approximately 10 percent of the sample which was aimed at meeting the basic normal distribution theorem threshold (Lyon, 2013). This test sample questionnaire was administered on a group of learners in a different university other than the two, but within the list of eight targeted public universities. Using a simple random technique to pick the 38 learners, 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 into descriptive statistics and inferential statistics, upon which linear regression analysis was undertaken. This enabled findings to be made, based on the objective, as well as the hypothesis. For each variable, the corresponding P-value of beta coefficient of each was compared to the significance level of 0.05, such that, if P-value of the coefficient was less than 0.05, it was concluded that the independent variable was statistically significant, and hence the null hypothesis was rejected.

Leaning courseware, the independent variable was hypothesized to be so because, as conceptualized in this study, distance learners essentially needed certain course contents, which are strategically designed in such a way that the instructional messages meant for enabling learning would be delivered accordingly. Where such courseware was inadequate, in terms of sufficiency, availability, and relevance, this would adversely affect the extent to which the said learners progressed academically, as measured through in their learning, as measured using examination retake rates, dropout rates, and graduation rates. 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 courseware, and e = error term.

RESEARCH FINDINGS AND DISCUSSION

Four 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 were used to determine how items on the research instruments were related to each other (Ehlers and Clerk (2000).

The independent variable, online learning courseware, had a coefficient of .85, which was above 0. 6, implying that the instrument used to collect data to measure this variable was reliable, and provided sufficient level of reliability for further analysis purposes. To test for linearity, for the purposes of regression modelling, and, therefore, to determine how the linearity of the variables in this study was adequate, Pearson Correlation Coefficient analysis was used to enable the comparison of the p-values of all the variables, where if p-value < 0.05, linear relationship between independent and dependent variables was determined to exist (Field, 2009).

All the relationships between the constructs within the independent and dependent variables were linear, with a p-value of less than P<0.01 in each case. The implication of these results, a far as this study was concerned, was that the variables and the constructs within were suitable for regression analysis as intended in this study, and that the instrument of measurement closely corresponds to the reality of the constructs which were measured.

A Multicollinearity test was undertaken to test for any possible complexities regarding the relationships among the variables in the study (Kothari, 2009).

The tolerance values for online learning courseware and academic progress showed tolerance values above the acceptable minimum limit of 0.1 (Senaviratna & Cooray, 2019). Going by these results, therefore, it was considered that the data arising out of the variables was suited for further analysis in line with the objectives of the study. Likewise, to determine the extent to which the sample was adequate, and, therefore, suitable for inferential statistics analysis, the Kaiser-Meyer-Olkin (KMO) test was undertaken.

This was, such that an acceptable KMO DF statistic greater than 0.05, but between 0.6 and 1, per data set was considered adequate for statistical analysis (Field, 2009). Consequently, the KMO statistic for the sample as used in this study was 0.723, higher than the 0.6, considered a good threshold as recommended by Field (2009). Therefore, the data collected from the sample of this study was considered adequate for inferential statistical analysis, in line with the objectives of the study.

DESCRIPTIVE STATISTICS

The objective of this study was to determine the extent to which the online learning courseware provided may influence the academic progress of distance learners in public universities in Kenya. Using a questionnaire, and based on three indicators; availability, relevance, and sufficiency, as

depicted on the conceptual framework. The respondents were asked to give information concerning online learning courses in use as conceptualized in this study. Three questions were posed to the respondents. On the first question, the respondents were asked to indicate on a drop-down list of typical course materials commonly used by the distance teaching providers to deliver online learning content to learners. The results are presented in the following table.

	Courseware	*1) Frequency*	Percent	Valid Percent
Valid	downloadable document	*2) 33*	42.9	42.9
	instructional video files	*3) 4*	5.2	5.2
	Quizzes	*4) 1*	1.3	1.3
	interactive discussions	*5) 6*	7.8	7.8
	Assignments	*6) 31*	40.3	40.3
	none of these	*7) 1*	1.3	1.3
	not sure	*8) 1*	1.3	1.3
	Total	*9) 77*	100.0	100.0

Source: Research Data (2023)

As indicated on the table, 33 respondents (43%) indicated using downloadable documents, while almost an equal number 31 (40%), indicated assignments. 6 (8%) indicated interactive discussions, with 4 (5%) indicating instructional video files. 1 indicated quizzes, 1 indicated that none of the above, while another 1 indicated not sure. Therefore, the findings were that the majority indicated downloadable documents, closely followed by assignments. The implication of these findings, as far as the hypothetical proposition of the study was concerned, was that the traditional, document-oriented means of delivering courses was still the mainstay. One would expect that, in the current digital-oriented learning environment, the more supportive means of delivering courses would be more digital-oriented.

Hence, for instance, interactive online discussions, and instructional videos, which are more suited to learners who rarely attended classroom-based face to face tutorials were expected to be a common feature. The distance learners, in this scenario, are likely to be hampered, because, in this case, the detachment from tutors is not adequately compensated for, as asserted by Abas, Osman, Kumar & Thangapragasam (2015). They emphasized that there was a need for a strategic development of interactive multimedia courseware for ODL learners which called for customized designing to target learner unique needs to ensure relevance and adequate adequacy for learner academic achievement.

For the second question on the questionnaire, a five level Liker type scale, numbered 5, 4, 3,2 and 1, representing strongly agree, agree, neither agree nor disagree, disagree and strongly disagree respectively was used for data collection. The respondents were asked to indicate their perceptions on three statements: 8.1, 8.2 and, 8.3. The statements were designed to enable the respondents to judge the extent to which the courseware in use at their respective universities was instrumental in promoting their academic progress. The responses are illustrated on the table below.

Descriptive Responses on Perception of Availability of Courseware

	SA	A	NAND	D	SD	Mean	SD
8.1 The university has an online facility where we log in, enroll for learning materials, quizzes, assignments etc. from anywhere any time	3%	8%	40%	14%	35%	2.71	1.11
8.2 There is/was prompt feedback from lecturers online	4%	21%	29%	30%	16%	2.31	1.10
8.3 There is prompt offline and online interaction with lecturers and the learning materials	5%	25%	25%	25%	20%	2.31	1.21

Source: Research Data (2023)

As illustrated on the table, a considerably high number of respondents tended to indicate the middle score; neither agree nor disagree. For the purpose of analysis in this study, it was considered that those who indicated that they neither agreed nor disagreed, should not be considered neutral because, either they did not understand the concept courseware, or did not strongly feel supported (Truebner, 2019). Either way, this was taken to imply that as a result, they most likely lacked the capacity to make good use of the courseware as a facility towards effective academic progress.

Hence, a neither agree nor disagree response was taken to imply Disagree, given that the respondent was most likely not interacting with the courseware well enough to make any value out of it, and hence, as a learning environment tool. Therefore, the findings seemed to show that the respondents seemed to perceive, based on the respective indicator statements used, that the courseware in use, was insufficient in terms of providing a facilitative environment for learning.

With respect to easy logging in, and enrollment for learning materials (99%) disagreed, while (11%) agreed on prompt feedback from lecturers (75%) disagreed, while (25%) agreed, and on prompt offline and online interaction with lecturers and the uploaded learning materials (70%) disagreed,

while (30%) agreed. Hence, for each indicator statement, and including those who neither agreed nor disagreed, the majority seemed to disagree. This further supports the findings under Q1 above, and equally, the empirical evidence regarding the role of courseware, where, distance learners, were likely to be hampered, if and when there was detachment from tutors and online learning materials (Abas, Osman, Kumar & Thangapragasam, 2015).

Further, as illustrated in the table depicted above, the mean and the standard deviation for each indicator seemed to support the findings, with the means of under 3 in each case, seeming to affirm the majority disagreeing responses respectively. The mean and standard deviation captured respectively also seem to illustrate a normal distribution, with minimal variation among the scores in each case. This is because, the empirical rule of thumb asserts that in a normal distribution, approximately 68% of scores would be within 1 standard deviation from mean. Also, that almost 95% of the indicated scorings would deviate within 2 points from the mean, and that approximately 99.7% of the grades would tend to fall around 3 deviations from the mean (Jim, 2019).

The third question on the questionnaire intended to provide a qualitative analysis of the same theme and designed to be a means of comparing the results of the quantitative data analysis obtained under Q1 and Q2, as discussed above, with the results of the qualitative analysis of the results under Q3. This was meant to enable the needful triangulation between the quantitative analysis and the qualitative analysis**.** In this respect, Q3 presented to the respondents, an open-ended question to the respondents, as follows; please suggest how the university may improve on courseware to aid leaning better: The results showed that all the respondents, except one who pointed out that the materials are "ok:, all the others pointed out what they perceived as needful improvements. This finding, therefore, seemed to be supportive of the findings on Q1 and Q2 beforehand that the online courseware was mainly lacking, in terms of providing a supportive environment by which the learners may effectively progress academically.

A descriptive qualitative data analysis was undertaken using data collected via a document analysis guide. The observation analysis guide was designed to enable the collection of qualitative data, by way of providing a physical observation and documentation of the physical infrastructural existence, and service status of the learning courseware environment, as indicated by three indicators: Evidence of existence, to which the respondents were supposed to indicate yes or no; Status, to which they were supposed to indicate either good, fairly good or poor, and Comment, to which they

were supposed to comment on the learning courseware in use.

In this respect, the researcher physically visited and, as much as possible, talked to the academic registrars, and or administrators in the respective departments of the respective universities, noting and documenting their responses regarding the physical state of the online learning courseware in use. The results indicated that a relatively few of the informants at both universities did not seem to be familiar with online courseware, especially the suggested Chat Boards and Interactive Video Clips. Indeed, almost half of the informants hesitated in responding yes or no to evidence of existence, and as many were not sure of the status, preferring to comment, in which case the majority (60%) made comments pointing to uncertainty, evidence of the use of written modules and handouts, instead of the expected digital learning courseware.

Inferential Statistics Based on Regression Analysis

The objective of this study was to determine the extent to which learning courseware may influence the academic progress of distance learners in public universities in Kenya. To achieve this objective, the respondent B.Ed. (Arts) distance learners from a sample of two public universities in Kenya; University of Nairobi, and Kenyatta University were used for data collection. Based on the previous descriptive analysis, on the same objective, a hypothesis was extracted for regression analysis as follows; H0: Academic progress of distance learners in public universities in Kenya is not influenced by learning courseware.

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 = online courseware and e = error term. The results of the regression analysis, based on the objective, and hypothesis, are presented on the following table:

Regression Results on Online Courseware and Learners' Academic Progress

Model Summary

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
1	.585[a]	.344	.334	.99860

a Predictors (Constant) X1

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	39.002	1	39.002	39.111	.0001[a]
	Residual	74.791	175	.997		
	Total	113.792	176			

a. Predictors: (Constant), x1
b. Dependent Variable y

Coefficients

Model		Unstandardized Coefficients		Stand. Coeff.	t	Sig.
		B	Stand. Error	Beta		
1	Constant	.423	.392		1.081	.283
	X1	.680	.109	.585	6.254	.0001

Source: Research Data Analysis (2023)

From the table above, the influence of online courseware was significant at a significance level of P<0.05, given Adjusted R square = .334 and F = 39.111, and P = 0001, where the adjusted R value of approximately 33% suggests a moderately strong relationship. This implies that the variation in academic progress which may be explained by online courseware as an element of the learning environment. Furthermore, the rest of the academic progress impact (67%) variation may be caused by other factors other than online courseware. Both the t-value of 6.254, and the Beta Coefficient of .680 were positive and substantially significant at P=0001, given a P<0.05 level of confidence.

This implied that for one unit change in online courseware, academic progress changed by approximately 33%. The null hypothesis, therefore, failed to be accepted and the alternative hypothesis was accepted.
This finding on academic progress is consistent with the reviewed empirical literature in this study. For instance, Abas, Osman, Kumar & Thangapragasam (2015), using an exploratory design, found The development of interactive multimedia courseware for ODL learners requires customized designing to target learner unique needs to ensure relevance and adequate adequacy for learner academic achievement.

Likewise, Mutisya and Makokha (2016), using a survey design to study the challenges affecting adoption of e-learning in public universities in Kenya, established that the majority of uploaded course modules were materials previouslyin handbooks and lacked interactivity.

This current study, therefore, seems to firm up the empirical literature, particularly referring to the two studies referenced above, which actually used exploratory and survey designs, as compared to the current study which used descriptive survey design. Consequently, this finding regarding online courseware, as an element of the distance learning environment provided potentially useful insights into the relevance of online courseware. This is that, if and when the public universities strategize on online courseware, there was a real possibility that the distance learners would be in an advantaged position regarding their all-important academic progress prospects, particularly regarding the availability, relevance and sufficiency of designated learning courseware, as provided by public universities.

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This study was premised on a hypothetical position that the challenges and setbacks to the academic progress of distance learners could be related to the learning environment, and especially in terms of the infrastructural digital or online learning courseware in use, in a given distance learning porogramme, in a given providing institution, in this study, university. This is because, as evidenced in theoretical and empirical literature, there are certain components which should be availed to learners, especially distance learners, to enable them successfully to undertake and complete their courses.

In this regard, this study considered, and undertook to study online learning courseware, a as key determinant of the extent to which distance learners were provided with adequate enabling online learning courseware, which would sustainably support the said learners towards their desired progression, and eventual completion of their academic pursuits. Hence, the objective of this study was to determine the extent to which the online learning courseware provided may influence the academic progress of distance learners in public universities in Kenya. The hypothesis which was extracted for regression analysis was that academic progress of distance learners in public universities in Kenya was not influenced by learning courseware, in terms of availability, relevance, and sufficiency.

On regression analysis, it was found that learning courseware had a positive statistically significant influence on academic progress of distance learners in public universities in Kenya.

CONCLUSION

On the basis of the objective, the hypotheses, and the findings herein, this study concluded that the online learning courseware, is a key component of the larger learning environment, as it was found to have a positive and statistically significant influence on the academic progress of distance learners in public universities in Kenya, as measured through examination retake rates, student dropout rates, and student graduation rates.

RECOMMENDATIONS

This study recommended that the universities ought to be more strategic, and creative, in providing a learning environment which addresses the needs of distance learners, including those that are directly and indirectly related to the infrastructural facilities.

This is with particular emphasis on the online learning courseware as conceptualized, examined and found in this study, to be significant in influencing academic progress of the learners.

In this regard, therefore, the universities ought to be more strategic, and creative, in providing appropriate learning courseware, which addresses the needs of distance learners, in terms of availability, relevance and sufficiency.

This would ensure that the provided learning courseware would adequately support the academic quest of distance learners, not only in public universities in Kenya, but also in any other learning institution which uses distance learning approaches. Ultimately, this would promote the prospects of such learners, as well as the providers of the said learning, in terms of reducing, if not eliminating examination retake rates and dropout rates, as well as achieving the highest possible levels of student completion for graduation rates.

AREAS OF FURTHER STUDY

Further and confirmatory studies on the same or related topic 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.

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