

Internet Connectivity as an Institutional factor influencing Utilisation of Online Library Services by Distance Learners at the University of Nairobi, Kenya

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Abstract

The purpose of this study was to investigate the influence of demographic and institutional factors on utilisation of online library services by distance learners of the University of Nairobi. Specifically, the study aimed at achieving one objective: viz. examine the influence of Internet Connectivity on Utilisation of Online Library Services by Distance learners at the University of Nairobi. The study was anchored on the positivist research paradigm. Descriptive survey and correlation research designs were adopted for this study. Data were collected using self-administered questionnaires and interview schedules. The target population consisted of 1671 learners in the School of Open and Distance Learning and 14 librarians found in the University of Nairobi namely Kikuyu Campus, Chiromo Campus and the main library Campus (The Jomo Kenyatta Memorial Library). The sample size was 312 respondents. A pre-test study was conducted using 31 learners and 1 librarian. This constituted 10% of the study sample. The researcher tested for the inter-item reliability of the instruments using Cronbach's Alpha and results ranged from 52.5%-95.8% for learners' questionnaires while that of librarians recorded 69.8%. Data analysis were done using frequency counts, the mean and standard deviation while hypothesis was tested using multiple linear regression analysis; One Way Analysis of Variance (ANOVA) was at 0.05 level of significance. The finding indicated that there is a significant relationship between internet connectivity and Utilization of online library services at the University of Nairobi. The results showed a coefficient of correlation $r = 0.309$, which suggests a positive relationship between variables; $R^2 = 0.137$, which implies a positive linear correlation. The significance of change also referred to as the p -value is $p = 0.019$. This value is pegged on the study putting the limit of 0.5 or 95 percent degree of the confidence interval. Since p -value $0.019 < 0.05$, the investigator rejected the null hypothesis and accepted the alternative that there was a significance relationship between Internet connectivity and utilisation of online library services at the University of Nairobi. The study recommends that all distance learners irrespective of their gender and age should be enlightened to use online library services provided by the University of Nairobi. In order to create awareness, there is need to engage distance learners in activities that give practice and require them to demonstrate their competence in evaluating the quality of information they use. The outcome of this study may act as basis for policy formulation for both the University of Nairobi and the government of Kenya regarding Distance Learning Programmes. Further research may be carried out to ensure that these demographic and institutional factors are tested in other study samples found in other public universities in Kenya.

Keywords: Internet connectivity, Institutional Factors, Distance Students, Utilization Online Library Services

INTRODUCTION

Distance learning has gained popularity in the recent times among universities in the world. This is due to the fact that universities are able to control the number of learners enrolling for the regular programmes (Farahani, 2003). Effective implementation of distance learning programme calls for utilisation of library resources and services, audio-visual media and application of information communication technology (Naidu, 2006). These resources and services are important because they can be used to communicate to learners in distance locations and at the same time enhancing effective coordination of sessions with groups or individual learners. Similarly, learners have the opportunity of getting information from print media and online library services while out of session (Naidu, 2006). This is to ensure that distant learners are adequately equipped with the right course content and examination techniques. Distance learners are called upon to make maximum utilisation of study centres to enable them read and search for information online (Sacchanand, 2002).

The library is thus the focal point of any centre of learning because it facilitates reading, inquiry and independent study by providing relevant support services and resources for teaching and learning (Candela, Athanasopoulos, Castelli, El Raheb, Innocenti, Ioannidis & Katifori, 2011). The library usually contains information services in different forms such as print media, electronic media and the Internet hence these services are important in supporting distance learning programmes. Most researchers in distance learning point out that digital library is an important component of distance learning programmes (Caspers, Fritts & Gover, 2001).

In a related study by Ganiyu (2013) on influence of demographic factors on use of online library resources by undergraduate students in two private universities in Nigeria, the findings indicated that University learners patronise their university libraries to search and retrieve relevant and up-to-date information in electronic or online format for effective teaching, learning and research purposes. The study further describes university library patrons as; undergraduate learners, postgraduate learners, researchers, information professionals, staff and other users from outside the university who intend to use the university library. Distance learners are expected to read further beyond class instructions to collect and retrieve information for class work, assignments, seminars term papers, dissertations, theses and projects and this information could be retrieved from online library resources (Ganiyu, 2013).

Online library services have emerged as an important component of research process for distance learners (Owusu-Ansah & Bubuama, 2015). This is because once the learners have conducted basic research such as consulting lecturers or checking at references in their reading lists they turn to online literature to initiate their research process. Notably, online library resources and e-resources have become areas of interest in higher education. As a result of this development, university libraries worldwide have embraced regular application of Internet resources, search engines and use of e-mail services as part of their normal communication process (Kindilchie & Sammarine, 2008; Owusu-Ansah & Bubuama, 2015).

The use of online database is usually faster than searching for the information in the print format more so when looking for the information in the archives. Online library services are more direct especially when one wishes to apply combinations of words to search for several files at ago, a task that can be achieved more easily than when using printed materials (Candela, et al., 2011). Online resources can also be downloaded, printed and search outcomes saved for future reference and at the same time flexible and can be updated more often than printed tools. Distance learners have the opportunity of accessing online library services from their distant locations away from the university library through the dial-up access (Dadzie, 2005; Candela, et al., 2011; Owusu Ansah&Bubuam,2015).

The other advantages of employing online library resources and services consist of; regular accessibility to online resources, the users have got the opportunity of operating from any location, availability of information in one place, numerous resources can be provided and finally, it creates room for easy access to information (Candela, et al., 2011; Owusu-Ansah & Bubuama, 2015). Learners' usage of online library services is informed by the fact that these services enhance the quality of the research work by enabling them to take less time in doing research while taking more time in the writing of their research papers. An online library service also increases learner's ability to obtain more services, a diversity of services, and more current and up-to-date services (Mwatela, 2013).

The advent of online technology has made it possible for universities to come up with different ways of restructuring their collections and information services in order to embrace the new developments. In responding to the new developments, university libraries have adopted the use of online information services, Information and Communication Technology (ICT) to meet the various demands of library users. Distance learners in spite of their demographic characteristics such as age, gender and religion are encouraged to explore the use of online

library resources and services in order to supplement their academic activities (Islam, 2011; Ganiyu, 2013; Nkamnebe, Udem, & Nkamnebe, 2014; Owusu-Ansah & Bubuama, 2015).

Globally, people are increasingly facing higher competition than ever before. Different from any other times in human history, this global competition is intensively knowledge based. CT in education has made significant progress in China over the last two decades in higher education process and is highly applied in distance based education by the executing agencies, targeting learners and goals to be achieved. The ability of computer technologies to change university teaching and learning is becoming an acceptable norm by education technologists (Finger, 2007; Candela, et al., 2011).

The application of ICT in education is becoming a major contemplation as developing countries concentrate on improving the quality of education. In Africa, for example, Aiona (2008) conducted a study in four main institutions offering distance learning programmes namely, the Open University of Tanzania (OUT), University of Nairobi (UoN), University of South Africa (UNISA) as well as the University of Botswana (UoB). The purpose of the study was to find out the availability of library and information support services for distance learners in those institutions. The findings revealed that there were no library support services in the said universities except for UNISA, which had embraced the most current information technology in providing services to distance learners; thus, library collection could be readily accessed through the Internet (Aiona, 2008).

A little earlier, Kavulya (2004) examined library services provision for distance learning among selected universities in Kenya, including Kenyatta University (KU), Africa Virtual University (AVU) as well as the United States International University – Africa (USIU-A), all based in Nairobi, Kenya. The findings revealed that, the learning as well as information services available in the institutions' libraries were inadequate and limited; thus, could not be accessed easily by distance learners. However, at AVU, the use of modern technology had taken root since both the catalogue and digital library were available in the Internet to all learners and other library users. Notably, AVU provided digital library in the form of e-journals-books and above all, online archives. On its part, USIU-A, had also made available its 6,000 electronic journals with full text on the Internet to its users (Kavulya, 2004).

Demographics and institutional factors usually offer important clues as to what factors promote distance learners' utilisation of online library services. For example, Islam (2011) conducted research on effects of demographic factors on e-learning effectiveness in Malaysian institutions of higher learning and found that learners' gender and level of education are key elements of e-learning programmes in education. The findings further revealed that learners with broad educational backgrounds had wider knowledge on application of technology and its merits in realising excellent academic achievement because this category of learners are equipped with the latest technological innovations and are up to date with computer usage and applications. Similarly, learners ought to be more computer literate in order to enhance exploration of the Internet and update their level of understanding in information through e-learning (Islam, 2011).

Similarly, Okiki and Asina (2011) assessed factors influencing use of electronic information sources among postgraduate learners in six Nigerian universities, including University of Ibadan, University of Lagos, Onabisi Onabanjo University, gun State; Federal University of Technology, Akure University of Agriculture and Lagos State University, the findings showed a positive correlation between utilisation of electronic information and the key concepts, which included learners' background characteristics and institutional factors (Okiki & Asina, 2011).

Various studies have examined the influence of institutional factors on the utilisation of online library and information sources among learners in institutions of higher learning, including distance learners. For instance, Alisona, Kiyngib and Baziraake (2012) reported a significant correlation between utilisation of medical e-resources and poor Internet connectivity; while Owusu-Ansah & Bubuama (2015) identified slow access to

Internet facilities as a key institutional factor constraining utilisation of online library services by distance learners at the University of Ghana. Other institutional factors influencing utilisation of online library services include inadequate number of functional computers in relation to the number of learners (Alisona, et al., 2012); as well as inadequacy of ICT infrastructural facilities included shortage of computers, lack of affordable online access by learners, as well as absence of in-depth ICT skills and information searching skills among library staff (Watts & Ibegbulam, 2006). The utilisation of online information sources is also affected by frequent power outages, inadequate assistance by library staff, lack of user support systems, as well as lack of subscriptions to some databases (Molefi, 2008; Alisona, et al., 2012).

In Kenya, the ICT Sector Policy Guidelines notes that “inadequate implementation of ICT policies, regulatory intensions to support rapid development, deployment of ICT infrastructure, limited support for research and inadequate support to ICT support are some of the key challenges facing ICT in Kenya” (Republic of Kenya, 2013). Still in Kenya, a study conducted by Githinji(2014) on factors influencing University of Nairobi Master of Education degree learners’ access and utilisation of ICT facilities, reported a low utilisation of scholarly electronic publications among postgraduate learners, particularly due to inadequate awareness about the availability of e-resources.

Despite enormous efforts made by various institutions to place information and communication as a key component of university teaching and learning, it emerges that both learners and faculty members are unable to make use of online resources and services. While this is usually attributed to diversity of operational deficits on the part of learners, faculty and universities, Githinji (2014) underscores the need for more research aimed at unearthing underlying factors that contribute to this kind scenario in Kenyan institutions of higher learning. It was in this context that the current study was an attempt to critically analyse the influence of demographic and institutional factors on utilisation of online library services by learners enrolled in the distance learning programme of the University of Nairobi.

1.2 Statement of the problem

Distance learners just like on-campus learners are entitled to information in all formats other than paper or print media (Nyambogo, Ongondo and Ongus, 2004). The study further reiterates that despite this position, some distance learners lack exposure to computers while others possess poor attitude towards Information Communication Technology. The records and statistics available at the University of Nairobi library reference section at the time of conducting this study indicated that, only about 22% of distance learners had visited the online library sites while majority of them 78% relied on print based materials in the other library section (JKML,2015). This could probably explain complaints raised by lecturers, that during presentation of their term papers and assignments, majority of distance learners do not use electronic resources to support their academic work despite the fact that the University of Nairobi library subscribe to a number of these services (Githinji,2014).

The University of Nairobi established an infrastructural ICT Centre in March 2002 which was tasked with responsibility of offering quality and cost effective Communication Technology that meet the changing learning, teaching and research and management requirements of the University. Currently, the registration of courses and selection of degrees, journals and books as well as abstracts from the University are all online (Lumbano, 2004, Githinji, 2014). Despite this positive move, the University is faced with serious challenges that ranges from ; lack of online courses, some basic facilities like computers are lacking in the Extra-Mural centres and still, some of the staff and learners who are supposed to use to use ICT and online library services have limited knowledge of accessing these facilities and services.

This implies that about the 3,406 learners who were enrolled in the School of Open and Distance Learning during the April Intake for the 2013/2014 academic year were disadvantaged in accessing ICT facilities and online library services provided by the University thus hampering their effective utilisation of these services for learning purposes (Mwatela, 2013). Demographic and Institutional factors are often critical in giving clues as to

what factors constitute to learners failure to embrace the use of ICT infrastructure and online library services (Mwatela, 2013, Githinji, 2014).It is in this context that this study set out to investigate the influence of demographic and institutional factors on utilisation of online library services at the University of Nairobi.

Internet Connectivity and Utilisation of Online Library Services

The concept of institutional factors is broad and may be addressed from the financial, human resource, support mechanisms as well as physical facilities and ICT infrastructural prisms. Notably, utilisation of online library services by learners can be influenced by all the four broad categories of factors. This study examined the influence of ICT infrastructural facilities and support systems factors on the access and utilisation of online library services by distance learners at the University of Nairobi.

A number of studies have established that there is a relationship between utilisation of online library services and multiple aspects of Internet connectivity .For instance, a study conducted by Dilek-Kayaoglu (2008) on use of electronic journals by faculty at Istanbul University in Turkey. The findings revealed that low bandwidth was one of the factors constraining utilisation of e-resources. Whereas the previous study was done in Turkey, the present study was done in Kenya at the University of Nairobi hence the knowledge gap that it filled.

In Similar study by Shukla and Mishra (2011) on use of e-resources by research scholars of Institute of Technology in Banaras University in India, the results showed that majority of research scholars have singled out low Internet connectivity and low connectivity speed as the major infrastructural problems in accessing e-resources by university learners in developing countries. The previous research was done in India while the current study was conducted in Kenya. Similar findings were mentioned by Madhusudhan (2010). In the latter study, respondents noted that it took too long to view or download pages and they found it difficult to get relevant information. Delay in downloads and inaccessibility of some websites were also identified by Obuh (2009) in a study that was conducted in Nigeria.

In a study by Watts and Ibeghulam (2006) on barriers to the use of online or electronic library resources available at the Medical Library College of Medicine, University of Nigeria at Nsukka. Among other findings, the study revealed that utilisation of online library services was constrained by inadequate ICT infrastructural facilities, including low internet connectivity and high cost of Internet access, through cybercafés. While the previous study was carried out in Nigeria at the Medical Library of Medicine, the present study was done at the University of Nairobi in Kenya hence the gap in Knowledge that the study filled.

In related study by Ondari-Okemwa (2004) on impediments to promoting access to global knowledge in Sub-Saharan Africa in Nigeria. The study identified prohibitive cost accessing Internet through cybercafé as a key factor preventing utilisation of online information resources in developing countries. While the previous study focused on provision of internet through cybercafé, the present study focused on the availability internet infrastructure at the University of Nairobi to support students enrolled in the Open and Distance Learning programme.

In Uganda, Alisona, Kiyigib and Baziraake (2012) examined factors affecting utilisation of medical e-resources in Ugandan public universities offering medical education. Among other findings, the study reported a significant correlation between utilisation of medical e-resources and poor Internet connectivity. Notably though, library users had no control over how many Internet access points the libraries could have. Ideally, they should be as many as the number of users but this was not the case in the institutions involved in the study. With limited bandwidth and lack of Internet in some offices, it became difficult for learners to readily access Internet, leading to poor usage of the resources. Whereas the previous study was done in Uganda among the public Universities offering medical education, the present research was done at one public University in Kenya targeting distance learning students as respondents thus the knowledge gap that the current study bridged.

The influence of slow access to the Internet facilities was also reported by the study conducted by Owusu-Ansah & Bubuama (2015). The authors pointed out that bandwidth limitations of the internet constrained access to relevant online resources by distance learners. Still in relation to Internet access, Alisona, et al. (2012) noted that utilisation of medical e-resources by learners was also affected by long and complicated access passwords for databases such as HINARI and SAGE. Consequently, learners who forgot passwords were less likely to utilise databases. The application of complicated passwords frustrated medical e-resource users. The previous study were done in Uganda while the present research was conducted at the University of Nairobi in Kenya.

In another study by Okongo (2014) on access and utilisation of digital information services at the University of Nairobi library, the findings revealed a significant relationship between Internet connectivity and utilisation of digital information resources and services in the library. Even though 42 (66.7%) respondents indicated that Internet connectivity in the University Library was reliable, about one-fifth (19.0%) believed that Internet connectivity was unreliable. While several studies have been done on access and utilisation of digital information services by students, this area has not been adequately studied in Kenya and more significantly among the distance learning students. It was therefore against this premise that the present study set out to investigate the influence of internet connectivity on utilization of online library services by distance learners at the University of Nairobi, Kenya.

METHODOLOGY

The research paradigm employed in this study is the positivist approach. Positivism emerged as a paradigm in the 19th Century with Auguste Comte’s rejection of metaphysics and assertion that only scientific knowledge can reveal the truth about reality. The positivist paradigm asserts that real events can be observed empirically and explained with logical analysis. The study adopted descriptive survey design. Orodho (2003) defines descriptive survey as a method of collecting information by interviewing or administering questionnaire to sample of individuals.

The study targeted learners enrolled for Bachelor of Education Arts (B.Ed. Arts) and Bachelor of Education Science (B.Ed. Science), in the School of Open and Distance Learning (ODL) of the University of Nairobi. Learners who were in their third year of study during the April intake of 2013/2014 academic year were selected for the study. This group level was chosen owing to the length of time they had taken at the University thus would provide the relevant and necessary information required by the researcher. Records from the two programmes indicated that B.Ed. Arts had a total of 1,578 learners out of which 848 were males and 730 were females. The programme of B.Ed. Science had 93 learners, which included 58 males and 35 females.

Table. 1: Population of third year learners (April intake 2013/2014) and librarians

Category	Male	Female	Total
B.Ed. (Arts)	848	730	1578
B.Ed. (Science)	58	35	93
Librarians	09	05	14
Total	915	770	1685

The sample size for this study was determined by using the formula, which was developed and advanced by Krejcie and Morgan (1970), as cited in Isaac and Michael (1981).

$$S = \frac{\chi^2 NP (1 - P)}{d^2 (N - 1) + \chi^2 P (1 - P)}$$

Table.2: Sample size of third year learners (April intake 2013/2014) and librarians

Category	Male	Female	Total
B.Ed. Arts	121	103	224
B.Ed. Science	47	27	74
Librarians	09	05	14
Total	177	135	312

Source: ODL (2014)

The researcher used two set of questionnaires to collect data from the respondents. One set of questionnaire was developed for learners while another set of questionnaire was developed for librarians. The researcher gave preference to use of questionnaire because it eliminates bias on the side of the researcher and the respondents while the interview schedule was used to corroborate responses received from questionnaires (Kombo & Tromp, 2006).

Face validity, according to Kalai (2009) refers to subjective judgement that the test appear to cover the relevant content. It also refers to subjective judgement of assessors about what the instrument appears to be measuring on the face value. The researcher applied expert judgement to arrive at the face value of the instruments. Finally, in order to determine the validity of the whole document, a Kaiser Meyer Olkin (KMO) formula test of validity was applied. A KMO test of validity provided a figure of 0.806. This implied that the sampled data was highly valid since the threshold is normally 0.5. The researcher applied expert knowledge in selecting essential questions to be included in the interview schedule.

The reliability of the full instrument was obtained using Cronbach's Alpha coefficient. This refers to a measure of internal consistency of set items in a group. It is thus considered to be a measure of skilled reliability of an instrument. Cronbach's Alpha Coefficient was used to measure inter-item reliability of the questionnaires. Each item of the questionnaire, measuring the same characteristics was treated as a mini instrument on its own. The questionnaire for learners was divided into seven sections and inter-item reliability was done for each section of the questionnaire. The result is shown in Table 3.

Table 3.3: Inter-item reliability test

Questionnaire section	Cronbach's Alpha	Percentage	F	No. of items
B	0.523	52.3	35.609	7
C	0.749	74.9	15.809	7
D	0.865	86.5	1.080	7
E	0.958	95.8	2.960	7
F	0.923	92.3	17.923	7
G	0.938	93.8	8.836	7
H	0.830	83.0	16.568	7

The results from Table 3 shows that Cronbach's Alpha for section B of the instrument was 0.523 (52.3 %) with an F-value of 35.609 out of the seven (7) items. In section C of the instrument Cronbach's Alpha was 0.749 (74.9%) while the F value was 15.809 out of the seven (7) items. Section D of the instrument recorded a Cronbach's Alpha of 0.865 (86.5 %) while the F value was 1.080 out of the seven (7) items. Section E of the instruments registered a Cronbach's Alpha of 0.958 (95.8 %) and an F value of 2.960 for the seven (7) items. Section F of the instrument indicated that the Cronbach's Alpha was 0.923 (92.3%) while F value was 17.923 for the seven (7) items. Section G of the instruments recorded a Cronbach's Alpha of 0.938 (93.8%) while the F

value was 8.836 out of the seven items. Finally section H of the instruments recorded Cronbach’s Alpha of 0.830 (83.0%) and F value of 16.568 out of the seven (7) items.

The general impression of the above results is that the inter-item reliability was over 50 percent for all the sections for the entire learners’ questionnaire instrument. Similarly, inter-item reliability test was inducted for the questionnaire for the librarians. The result indicated a Cronbach’s Alpha of 0.698(69.8%) while the F-value was 16.915 out of the (7) items.

Authority to conduct research was obtained from National Commission for Science, Technology and Innovation (NACOSTI) before setting out for data collection. The researcher also reported to the Director of Open, Distance and eLearning (ODEL) Campus for clearance. The researcher obtained permission from the Dean, ODL to conduct research. Simple random sampling was used to gather information from respondents. In this regard, the researcher used pieces of papers written “Yes” for the number of learners required for the study sample and “No” for the remaining portion. These papers were thoroughly mixed and shuffled in a container for learners to pick to ensure that each learner had an equal chance of being selected.

First, questionnaires were personally administered to learners and librarians. Direct contacts with respondents provided the researcher with an opportunity to interact and instruct the respondents on how to complete the questionnaires and assure them of the confidentiality of their responses. Personal involvement was an important factor in motivating the participants to respond more readily than if the questionnaires had been mailed to them. An opening note was addressed to all the respondents to confirm this commitment.

RERSULTS AND DISCUSSIONS

Internet connectivity and utilisation of online library services

This objective was to investigate the extent to which internet connectivity influence distance learners use of online library services at the University of Nairobi. Respondents were therefore asked to indicate the extent to which Internet connectivity influenced utilisation of online library services. The 7 items containing statements regarding online library service scores were scored on a five-point rating scale which included, not at all, less extent, not sure, great extent and very great extent. Respondents were asked to indicate their views on the utilisation of the 7 online library services, based on the domains of the rating scale. Details are presented in the preceding sections. **Internet connectivity and utilisation of online digital repository**

The study sought to determine the influence of Internet connectivity on utilisation of online library services at the University of Nairobi. In this regard, respondents were required to indicate their views regarding the extent to which Internet connectivity influenced utilisation of online digital repository. The results are shown in Table 4.

Table 4. Internet connectivity and utilisation of digital repository

Internet connectivity determines use of online digital repository	Frequency (f)	Percentage %	Cumulative percent
Not at all	176	68.0	68.0
Less extent	17	6.6	74.5
Not sure	9	3.5	78.0
great extent	33	12.7	90.7
To a very great extent	24	9.3	100.0
Total	259	100.0	
Mean	2.34		

The results in Table 4 shows that most respondents 176 (68.0%) and 17 (6.6%) did not agree with the statement that Internet connectivity influenced utilisation of online digital repository. This is followed by 33 (12.7%) who acknowledged that Internet connectivity influenced utilisation of digital repository to a great extent while by 24 (9.3%) respondents indicated that Internet connectivity influence utilisation of online digital repository to a very

great extent. The implication of this result is that Internet connectivity has little influence on utilisation of online digital repository. The mean score obtained was 2.34.

Internet connectivity and utilisation of online newspapers

The study also examined the influence of Internet connectivity on utilisation of online newspapers. In this regard, respondents were also asked to indicate the extent to which Internet connectivity influenced utilisation of online newspapers. The results are contained in Table 5.

Table 5: Internet connectivity and utilisation of online newspapers

Internet connectivity determines use of online newspapers	Frequency (f)	Percentage %	Cumulative percent
Not at all	175	67.6	67.6
Less extent	25	9.7	77.2
Not sure	7	2.7	79.9
great extent	40	15.4	95.4
Very great Extent	12	4.6	100.0
Total	259	100.0	
Mean	1.92		

The results in Table 5 show that majority 175 (67.6%) respondents did not agree with the statement that Internet connectivity influenced utilisation of online newspapers by scoring in for not at all. This was followed by 25 (9.7%) who scored in the less extent level while 40 (15.4%) held the contrary view that Internet connectivity influenced utilisation of online newspapers by scoring in the great extent level. Notably, 12 (4.6%) indicated that utilisation of online newspapers was very great extent while about 7 (2.7%) were not sure. The implication of this result is that Internet connectivity had less influence on utilisation of online newspapers. The mean score calculated was 1.92.

Internet connectivity and utilisation of online public access catalogue

The study sought to investigate the influence of Internet connectivity on utilisation of OPAC. Thus, respondents were asked to indicate the extent to which Internet connectivity influenced utilisation of OPAC. The results are summarised in Table 6.

Table 6: Internet connectivity and utilization of online public access catalogue

Internet connectivity determines use of online public access catalogue	Frequency (f)	Percentage %	Cumulative percent
Not at all	62	23.9	23.9
Less extent	28	10.8	34.7
Not sure	81	31.3	66.0
great extent	36	13.9	79.9
To a very great extent	52	20.1	100.0
Total	259	100.0	
Mean	3.14		

The results presented in Table 6, show that 62 (23.9%) and 28 (10.8%) respondents scored for not at all and less extent level respectively. Contrastingly, up to 36 (13.9%) and 52 (20.1%) agreed with the opinion that Internet connectivity influenced utilisation of OPAC. Notably, about one-third, 82 (31.7%) were not sure. The results imply that utilisation of OPAC was greatly influenced by Internet connectivity. Cumulatively results show that up to 88 (34.0%) respondents were in agreement that Internet connectivity influenced utilisation of OPAC; compared to 90 (34.8%) respondents who were of the contrary opinion.

Internet connectivity and utilisation of online electronic books

The study focused on establishing the influence of Internet connectivity on utilisation of online electronic books. In order to achieve this investigation, respondents were asked to indicate the extent to which Internet connectivity influenced utilisation of online electronic books. The results are shown in the Table 7.

Table 7. Internet connectivity and utilization of online electronic books

Internet connectivity determines use of electronic books	Frequency (f)	Percentage %	Cumulative percent
Not at all	114	44.0	44.0
Less extent	32	12.4	56.4
Not sure	42	16.2	72.6
Great extent	29	11.2	83.8
Nearly great extent	42	16.2	100.0
Total	259	100.0	
Mean	2.50		

Cumulative results in Table 7. Show that majority of the respondents 146 (56.4%) did not agree with view that Internet connectivity influenced utilisation of online electronic books while 42 (16.2%) were not sure. However, 71 (27.4%) were of the contrary opinion that Internet connectivity influenced utilisation of online electronic books services. The results imply that Internet connectivity had little influence on utilisation of online electronic books. The mean score was calculated at 2.50.

Internet connectivity and utilisation of electronic-journals

The study investigated the influence of Internet connectivity on utilisation of electronic journals. In this regard, respondents were requested to indicate their views regarding the extent to which Internet connectivity influenced utilisation of online electronic journals. The results are displayed in Table 8.

Table 8: Internet connectivity and utilization of online electronic journals

Internet connectivity determines use of electronic journals	Frequency (f)	Percentage %	Cumulative percent
Not at all	125	48.3	48.3
Less extent	17	6.6	54.8
Not sure	37	14.3	69.1
great extent	36	13.9	83.0
Very great extent	44	17.0	100.0
Total	259	100.0	
Mean	2.39		

The results from Table 8 shows that 125 (48.3%) respondents scored for not at all level, 17 (6.6%) respondents scored for less extent while 37 (14.3%) respondents indicated that they were not sure. Contrastingly, 36 (13.9%) and 44 (17.0%) respondents indicated great extent and very great extent, respectively. Cumulative results show that most respondents, 142 (54.8%) did not support the view that Internet connectivity influenced utilisation of online electronic journals, while only 80 (30.9%) agreed with statement that Internet connectivity influenced utilisation online electronic journals. The implication of this finding is that, Internet connectivity had less influence on utilisation of online electronic journals. The mean score computed was 2.39

Internet connectivity and utilisation of online database

The study was concerned with establishing the influence Internet connectivity on utilisation of online database. Consequently, respondents were required to indicate the extent to which Internet connectivity influenced utilisation of online database. The results are contained in Table 9.

Table 9: Internet connectivity and utilization of online database

Internet connectivity determines use of online database	Frequency (f)	Percentage %	Cumulative percent
Not at all	144	55.6	55.6
Less extent	18	6.9	62.5
Not sure	29	11.2	73.7
To a great extent	26	10.0	83.8
Very great extent	42	16.2	100.0
Total	259	100.0	
Mean	2.30		

Table 9 shows that 144 (55.6%) and 18 (6.9%) respondents scored for not at all and less extent, respectively. Another 29 (11.2%) respondents said they were not sure. However, 26 (10.0%) and 42 (16.2%) respondents scored for great extent and very great extent, respectively. Cumulatively, up to 162 (62.5%) did not agree with the statement that Internet connectivity influenced utilisation of online database while only 68 (26.3%) supported the opinion. The implication of this result is that Internet connectivity has little influence on utilisation of online database. The mean score registered was 2.30.

Internet connectivity and utilisation of online research papers

The study sought to determine the influence of Internet connectivity on utilisation of online research papers. To achieve this, respondents were asked to indicate the extent to which Internet connectivity influenced utilisation of online research papers. The results are shown in Table 10

Table 10: Internet connectivity and utilization of online research papers

Internet connectivity determines use of online research papers	Frequency (f)	Percentage %	Cumulative percent
Not at all	139	53.7	53.7
Less extent	13	5.0	58.7
Not sure	10	3.9	62.5
great extent	22	8.5	71.0
To a very great extent	75	29.0	100.0
Total	259	100.0	
Mean	2.48		

As indicated in Table 10, most respondent, 139 (53.7%) scored in the not at all level, 13 (5.0%) scored in the less extent category while 10 (3.7%) respondents were not sure. On the other side of the scale, 75 (29.0%) and 22 (8.5%) respondents scored in a very great extent and great extent, respectively. Cumulative results further show that up to 152 (58.7%) did not support the view that Internet connectivity influenced utilisation of online research newspapers while 97 (37.5%) respondents supported the test statement, which suggest that Internet connectivity influenced utilisation of online research papers. The results imply that Internet connectivity had less influence on utilisation of online research papers. The mean score recorded was 2.48.

Mean score on Internet connectivity and utilisation of online library services

The study further established mean scores on influence of Internet connectivity on utilisation of online library services. This was accomplished by computing and comparing scores of means of different online library services. The mean of means was also calculated to provide a basis for making conclusions. In this regard, the investigator assumed that any online library service that obtained a mean above the mean of means was rated high. Equally, any service that scored a mean that was lower than the mean of means was rated low. Table 11 presents the results.

Table 11: Internet connectivity and utilization of online library services

Online library services	Mean	Std. Dev.
Online digital repository	2.34	0.481
Online newspapers	1.92	0.530
Online research papers	2.48	0.223
Online public access (OPAC)	3.14	0.125
Online electronic books	2.50	0.104
Online electronic journals	2.39	0.114
Online electronic database	2.30	0.093
Total Mean	17.07	
Base Mean	2.44	

The results from Table 11 show that OPAC registered the highest mean of 3.14, followed by online electronic books recorded a mean of 2.50, online research papers with 2.48 and online electronic journals with 2.39. At the bottom of mean scores, were online digital repository had a mean of 2.34, followed by online database at 2.30 and online newspapers at 1.92. Based on the means or means, which was 2.44, that investigator concluded that Internet connectivity highly influenced the following services: online public access catalogue (3.14), online electronic books (2.50), and online research papers (2.48). On the other hand, Internet connectivity had a low influence on online electronic journals (2.39), online digital repository (2.34), electronic database (2.30), and online newspapers (1.92). The findings further reveal that the most factor that was highly influenced by Internet connectivity was online public access catalogue at 3.14. This finding is in agreement with the findings from the interview schedule. For example, when asked to comment on the influence of student Internet connectivity on utilisation of online library services, one of the librarians from Kikuyu campus commented as follows;

“Internet connectivity is a crucial factor that often influences utilisation of library service by all library users. Key aspects of Internet connectivity that matter here are bandwidth strength, consistency and search strength”

The relationship between Internet connectivity and utilisation of online library services (as measured by mean score) was investigated using multiple linear regression analysis. The null hypothesis stated as follows;

6. Ho: There is no significant relationship between Internet connectivity and utilisation of online library services at the University of Nairobi.

The results are contained in Table 12

Table 12: Regression analysis on Internet connectivity and utilization of online library services

Model	r	R ²	Ads R ²	Std error of estimate	R ² Change	F change	df1	df2	Sig change
1	0.309	0.137	0.079	0.735	0.137	2.297	10	12	0.019

As indicated in Table 12, the coefficient of correlation $r = 0.309$, which suggests a positive relationship between variables; $R^2 = 0.137$, which implies a positive linear correlation. The significance of change also referred to as the ρ -value is $\rho = 0.019$. This value is pegged on the study putting the limit of 0.5 or 95 percent degree of the

confidence interval. Since p -value $0.019 < 0.05$, the investigator rejected the null hypothesis and accepted the alternative that there was a significance relationship between Internet connectivity and utilisation of online library services at the University of Nairobi. The findings are in agreement with the librarians' perceptions regarding the influence of Internet connectivity on utilisation of online library. The findings also support the outcome of other studies conducted by Alisona et al. (2012), as well as Owusu-Ansah & Bubuama (2015) who reported a significant correlation between utilisation of medical e-resources and poor Internet connectivity, which was attributed to limited bandwidth, which constrained access to relevant online resources by distance learners. Delay in downloads and inaccessibility of some websites were also identified by Obuh (2009) in a study that was conducted in Nigeria.

Further investigation was conducted using ANOVA to test how regression model statistically significantly predicts the outcome variable (the significance of the relationship between the dependent and independent variable). The results are shown in Table 13.

Table 13: Analysis of Variance

Model	Sum of square	Df	Mean square	F	sig
Regression	12.290	10	1.232	2.387	0.019
Residual	79.275	148			
Total	91.563				

The ANOVA Table 13 indicate that F statistic is 2.387 meaning that 23.87 percent of the model fits the linear line and therefore, has been explained by the independent variables hence this model fits interpretation.

Conclusions

This study concluded that there was a positive influence of internet connectivity on the utilisation of online library services by distance learners. The results alluded to the fact that digital library services are crucial for the success of distance learning programmes. On their part, digital libraries fulfil their purpose by depending heavily on the Internet. Consequently, the functionality of digital libraries and distance learning programmes depends on the availability and stability of the Internet.

Recommendation

In order for distance learners to optimally utilise online library services at the University of Nairobi, The University of Nairobi management should install a powerful and reliable Internet connectivity. This will enhance effective utilization of online library services by learners enrolled in the distance learning programmes.

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