Access to and Use of Icts in the Provision of Information to Distance Learners in Kenyan Universities

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Abstract

The purpose of the study which informs this chapter was to investigate access to and use of ICTs in the provision of information to distance learners at the University of Nairobi (UoN) and Kenyatta University (KU) libraries; and to make recommendations for improvement. The study employed a mixed methods research design. Stratified, purposive and census sampling techniques were alternately used to select key participants namely: distance learners, directorate of distance education, deans of schools and chairmen of departments, university librarians and senior library staff. A sample of 200 distance learners and 56 respondents from the other strata was selected. Data was collected through a semi–structured questionnaire administered to distance learners, semi-structured interviews with the other respondents and documentary review. The data was analysed using descriptive statistics. The key findings of the study were that: distance learners had limited access to and use of ICTs; they could not access e-resources from the university library remotely; and they experienced challenges in accessing information through ICTs. Distance learners will benefit from this study from improved access to information through ICTs thereby increasing the quality of their education. This study will also inform university libraries in Kenya in general and the University of Nairobi and Kenyatta University libraries in particular on improving their information services for distance learners through ICTs.

Keywords: *Distance learners, Information Communication Technologies (ICTs), Kenya, library services, university libraries*

Introduction

This chapter discusses access to and use of ICTs in the provision of information to distance learners in two universities in Kenya: University of Nairobi (UON) and Kenyatta University (KU). Distance Education (DE) is becoming popular for accessing higher education due to its flexibility. Distance Education has been described by various terminologies such as university without walls, extramural studies, experimental learning, off-campus education, open learning, extended campus, the external degree, or university extension. According to the Commonwealth of Learning (2015), distance education refers to the delivery of learning to those who are separated mostly by time and space from the teachers mediated by technology for delivery of learning content with possibility of face-to-face interaction for learner-teacher and learner-learner interaction.

Distance education in Kenya started with the admission of 594 students to the University of Nairobi in 1995 (Kavulya, 2004). The mode of instruction was by correspondence and few contact hours when lecturers visited the regional sites. The learning resources used consisted of self-instructional materials in print, video and audio-cassettes. From these humble beginnings, the Correspondence Course Unit rose to become the College of Adult and Distance Education comprising of an Institute of Extra Mural Studies located and co-ordinated at the Kikuyu Campus of the University of Nairobi.

Kenyatta University launched the School of Distance Learning in 2001. The mode of instruction was by correspondence. Self-instructional materials in print, video and audio cassettes were used as learning resources. At specified periods, students would go to the centres for formal lectures and examination (Kavulya, 2004). One of the major recommendations from the 2006 e-readiness survey of higher education in institutions in Kenya by the Kenya Education Network (KENET) was the urgent need for e-learning (KENET, 2007). We are, therefore, likely to see e-learning becoming more and more widespread in Kenyan universities. This will facilitate students and faculty to become more exposed to online information resources. Access to and use of Information Communication Technologies (ICTs) will play a big role in ensuring that distance learners exploit the electronic resources for their study.

The undertaking of ICTs in public university libraries is enormous in the country. In Kenya, training opportunities such as mixed mode of delivery (face-to-face and distance education) have been provided using ICTs such as the Internet, CD-ROMs, computers, video-conferencing, mobile telephones

and electronic communication to enable e-learning. Currently, such learning approaches are in use at the University of Nairobi (UoN) and Kenyatta University (KU).

Distance learning in virtual universities is supported by a comprehensive network of services from academic management system, libraries, student and tutor portals and services as well as other support staff. Libraries promote critical thinking and the ability to conduct independent research among students. This study is based on the premise that ICTs are important in the development of digital or electronic libraries which in turn provide easy access to information resources and services to learners remotely. The basic building blocks of a digital library include automation of library systems, sufficient ICT facilities (computers, networks) and adequate connectivity (Rosenberg, 2005).

Rationale

The increase in distance learners' enrolment in Kenya has led to a change in learning patterns in higher education. This in effect is calling for a paradigm shift in information delivery by university libraries to this category of users. The existing library services in public university libraries in Kenya were originally designed for the on-campus users and are not suited for the needs of distance learners.

Unfortunately, public university libraries in Kenya have not responded to this change by providing information access for distance learners which can be achieved through ICTs. A study by Aseey (2004) found out that access to the University of Nairobi library was a big problem facing distance learners. According to Cooper (2000), less attention has been given to providing information services for the distance programmes during the planning for distance education. Instead the attention has focused on the logistics and methodology of teaching of these programmes only.

Although public university libraries in Kenya are adopting the use of ICTs in information services delivery, distance learners are disadvantaged because of limited access to and use of ICTs occasioned by scarcity and limited range of ICTs, level of e-readiness for distance learners and absence of or unsuitable policies for distance learning. Distance learners need to access relevant and up-to-date research information in order to achieve superior academic skills in their studies. Lack of systems that can provide distance learners with access to information negatively impacts on their studies. The

Association of College and Research Libraries (ACRL) guidelines state that distance learners are entitled to the same library services and resources as the regular students on campus (ACRL, 2008). The important role of libraries in supporting distance education in Kenya is emphasised by the Commission for University Education – CUE (2012). The CUE standards on distance learning library services state that a university shall provide adequate resources to support open and distance learning library services.

Purpose

The purpose of the study which informs this chapter was to investigate access to and use of ICTs in the provision of information to distance learners at the University of Nairobi and Kenyatta University libraries and to make recommendations for improvement. This chapter investigates the range of ICTs at the selected universities and to explore the level of e-readiness of the libraries for distance learners.

Review of Literature

The study, informing this chapter, was guided by the Diffusion of Innovation (DoI) Theory complemented by the Constructivism Learning Theory. The DOI Theory, attributed to Everett Rogers, states that diffusion is the process by which an innovation is communicated through certain channels over time among members of a social system (Rogers, 1995). The theory is used as a basis to explain the process of adoption of ICTs at the two universities. The theory has been used by other scholars as the theoretical basis for information projects (Minishi-Majanja & Ochola, 2004; Minishi-Majanja & Kiplanga't, 2005).

The Constructivism Learning Theory, attributed to Jean Piaget (Liu & Matthews, 2005), views learning as the result of mental construction by learners through interaction with their environment. The emphasis is on the learner rather than the teacher. The theory is found appropriate in this study because the trainer is distant from the learner and acts only as a facilitator.

Various user studies on the needs and expectations of distance learners internationally established that distance learners' information needs were not being adequately met (Moyo & Cahoy, 2003; Mabawonku, 2004; Boadi & Letsolo, 2004; Maclean & Dew, 2008). Previous studies in Kenya established that the libraries were not providing adequate services to distance learners (Kavulya, 2004; Wachira & Onyancha, 2012).

A study by Rosenberg (2005) found that the number of public university libraries in English–speaking African countries that could make effective use of e-resources was small due to inadequate ICT infrastructure. In their study on internet adoption in Kenyan university libraries, Odero–Musakali and Mutula (2007) found that while most of Kenyan university libraries had access to the Internet, very few appeared to have integrated the technology into their routine operations. Similarly, the e-readiness survey of Kenya Education Network – KENET (2007) revealed that off-campus access to library resources by users was limited. Although the UoN and KU libraries have web-based OPAC and provide access to electronic resources, it is not clear how distance learners benefit from the e-resources. The result is that students and researchers frequently use Google and in so doing miss out the vetted and relevant information resources provided by the library which can be delivered in real-time. Murray (2003:146) opines that "if the academic library profession is to avoid becoming sidelined by Google-type search engines and commercial database services, then they must offer a web presence that delivers relevant, quality, approved and personalised access to resources and library services – irrespective of format and location".

Inadequate information literacy skills have been identified as an impediment to distance learners in the search for information (Kavulya, 2004; Akande, 2011). Libraries have commonly provided training and support to students through mechanisms like bibliographic instruction, workshops and on an individual basis as needed most of which happens on-site. With distance education and the electronic library environment, the mode of training should be electronic asynchronous training through computer-based tutorials. Distance learners need information literacy skills in order to identify and obtain relevant information for study and lifelong learning. Information literacy trainings have been conducted by the University of Nairobi library especially for the Kenya Libraries and Information Services Consortium (KLISC) members. However, it is not clear how these literacy programmes benefit the distance learner.

Methodology

A multiple case study approach was adopted based on two case organisations, the UoN and KU. The case study was found suitable because it allowed for in-depth investigation into the selected cases (Kothari, 2004). The selection of the two cases was based on the amount and quality of information they were expected to generate about the research problem. They had well established distance education programmes among public universities in Kenya. In addition, their libraries had adopted the application of ICTs.

Earlier related empirical studies carried out in Kenya were based on interviews with librarians only. This study on the other hand employed a mixed method research design with a combination of both quantitative and qualitative data collection techniques. The epistemological stance on mixed methods approach is one in which the researcher tends to base knowledge claims on pragmatic grounds (Creswell, 2003). The triangulation of methods helped to best understand the research problem as well as provide a convergence of results (Cresswell, 2003; Neuman, 2006).

Stratified sampling technique was first applied to the target population to come up with six strata of the population at each case study namely: distance learners, Directorate of Distance Education, Deans of Schools and Chairmen of Departments, ICT Directorate, University librarians and senior library staff. Purposive sampling technique was employed for selecting key informants from distance students, Deans of Schools and Chairmen of Departments and senior library staff while census was used for the Directorates of Distance Education, ICT Directors and University Librarians. A sample of 200 Distant Learners and 56 respondents from the other strata was selected. The sample comprised 100 Distance Learners from each case; five Directors from the UoN and three from KU were selected from the Directorates of Distance Education. Another 12 members from each case were picked from the category of Deans and Chairmen of Departments. A selection of one ICT Director from each case, one University Librarian from each and another 10 senior library staff (senior librarians and librarians) from each case. This kind of categorization ensured that the sample was as diverse as possible, representative, accessible and knowledgeable. Table 1 and Table 2 below show the sample size and the response rate respectively.

Table 1: Sample Size

Category of Respondents	UoN	KU	TOTAL
Distance Students (postgraduates and undergraduates)	100	100	200
Directorate of Distance Education	5	3	8
Deans and Chairmen of Departments	12	12	24
ICT Directors	1	1	2
University Librarians	1	1	2
Senior Library Staff (Senior Librarians and Librarians)	10	10	20
Total	**129**	**127**	**256**

Source: Research data

Table 2: Response Rate

Category of Respondents	UoN		KU	
	Frequency	**Percentage (%)**	**Frequency**	**Percentage (%)**
Distance Students (postgraduates and undergraduates)	74	74	61	61
Directorate of Distance Education	5	100	3	100
Deans and Chairmen of Departments	8	66.7	8	66.7
ICT Directors	1	100	1	100
University Librarians	1	100	1	100
Senior Library Staff (Senior Librarians and Librarians)	8	80	8	80

Source: Research data

Primary data which were quantitative in nature were collected through a semi structured questionnaire administered to distance learners. A section of the questionnaire was open ended providing an opportunity for distance students to provide additional information. Qualitative data was collected through face-to-face interviews conducted with the other respondents namely; the Directorate of Distance Education; Deans of Schools and Chairmen of Departments; ICT Directorate; University librarians and senior library staff

respectively. An interview guide was used to lead the researcher in the interviews. Secondary data was collected through documentary review. Quantitative data collected was analyzed using descriptive statistics and qualitative data was analyzed thematically.

Findings and Discussions

The study revealed many similarities and a few differences between the two case study organizations. Not all respondents answered every question resulting in the differences in total numbers in some cases. The findings are presented below.

Age and Gender Influence on Access to and of Use of ICTs by Distance Students

Age was found to have an influence on the access and use of ICTs in both case organizations. The main users of ICTs among distance students in both cases were generally the younger students. Findings indicate that the predominant age group using computers was between 31-35 years of age at the UoN and between 26-30 years at KU. These findings are consistent with the findings of other scholars who established that users of computer and internet were in the age group of 18-34 years (Akande, 2011; Ndung'u et. al. 2012). Figure 1 and Figure 2 below show age distribution in access to and use of computer by distance students from the UoN and KU respectively.
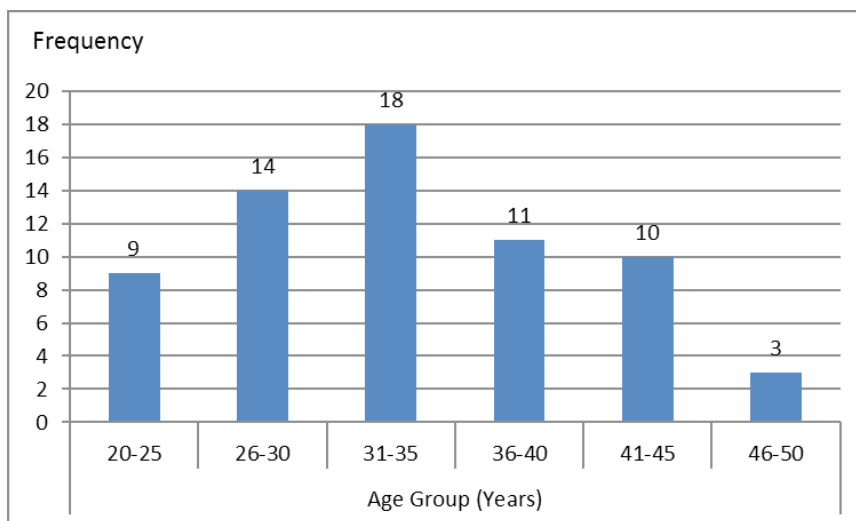

Figure 1: Age Distribution and Access to and Use of Computer at the University of Nairobi
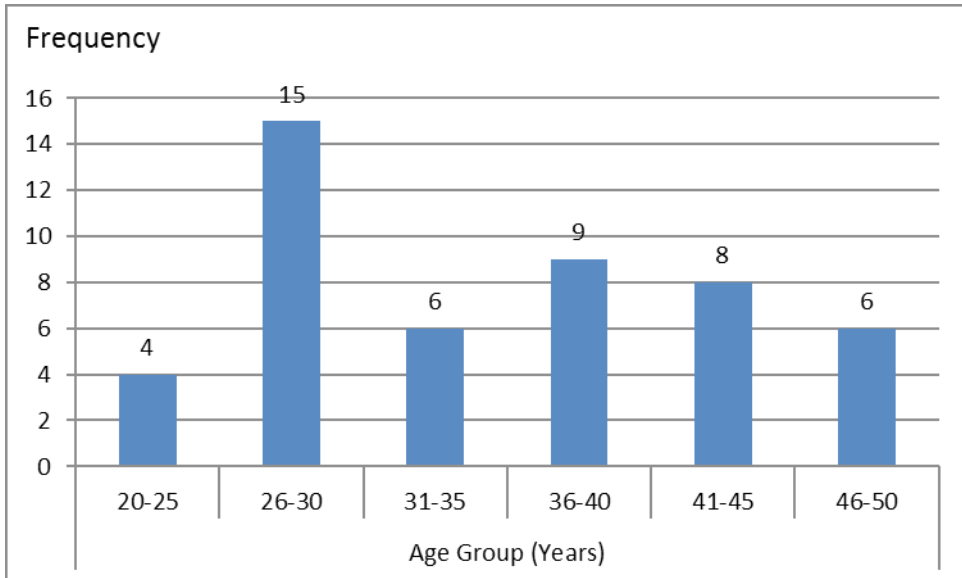
Source: Research data

Figure 2: Age Distribution and Access to and Use of Computer at Kenyatta University

Source: Research data

On the other hand, gender was not found to influence the access and use of ICTs. At the UoN, 42 out of 48 (87.5%) of male students and 23 out of 26 (88%) of female students had access to a computer. At KU, 31 out of 42 (73.8%) of male students and 17 out of 19 (89.5%) of female students had access to a computer. Therefore, there is no apparent association between gender and use of ICTs at both case organizations. This can be attributed to the fact that both male and female students exhibited similar education and socio-economic status hence equal opportunities. These findings concur with findings of other studies that argue that gender alone does not influence use of ICTs. Other factors like education and socio-economic status influence the usage patterns among females and are the main cause of low usage where female users are concerned (Oyelaran-Oyeyinka and Adeya, 2004; KENET, 2008; Lera-Lopez *et. al.*, 2011; Ndung'u *et. al.*, 2012).

Extent of Use of ICT Infrastructure by Distance Learners

The first objective was to investigate the range of ICTs used by the selected universities. The findings are discussed below.

Findings from interviews with staff indicate that the two case organisations had similar ICT infrastructure. This was in the form of networked desktop computers found in offices, computer labs, the library, students' cyber cafés, fiber optic Internet connection, wireless Internet (WiFi), laptops for deans, chairmen of departments and directors, personal mobile phones. Some study centres were also on fiber link. The libraries in both universities had also automated the library system on integrated library management system and had developed library websites. However, the study revealed that KU had more computers than the UoN. At KU, some members of faculty namely deans, chairmen of departments and directors, had been provided with laptops by the university as opposed to the UoN. Additionally, KU had a higher PC to students' ratio (5 PCs per 100 students) than the UoN which had three PCs per 100 students.

However, the number of computers in both case study organisations was still insufficient as it fell below the recommended 10 PCs per 100 students. The findings concur with the findings of KENET (2008) e-readiness survey which established that for all 48 African universities surveyed, the PC ratios were all below the recommended average ratio of 10 PCs per 100 students. The study findings showed that the ICTs in universities were not being utilised to support distance students. Furthermore, the regional centres at both institutions lacked proper ICT facilities and infrastructure such as electricity supply and telecommunications. This was corroborated by findings from distance students as discussed below.

Location of Computers Used by Distance Students

The study established that 65 (87.8%) of the respondents from the University of Nairobi and 48 (78.7%) from Kenyatta University had access to a computer. However, not all the respondents owned a computer as shown in the following section.

From the UoN, 43 (58.1%) of respondents accessed and used computers from a commercial cyber café, 18 (24.3%) from a personal laptop and 16 (21.6%) from the work place. From KU, 35 (57.4%) accessed and used computers from the work place, 22 (36.1%) from a commercial cyber café, 21 (34.4%) from the university library and 17 (27.9%) had personal laptops. The findings reveal that the majority of distance students used computers from outside the university library and the study centre as shown in Table 3 and Table 4. This is because distance students could only access the ICTs provided by the university library during residential sessions but even then, the timetable was so rigid that they rarely found time to use the computers provided. This

finding is consistent with the findings of Nwezeh (2010) on libraries and distance education in Nigeria. The findings indicate that 82.4% respondents had never used the Internet inside the library even if the facility was there. Table 3 and Table 4 below show the location of computers used by distance students from the UoN and KU respectively.

Table 3: Location and Use of Computers by Distance Students at the University of Nairobi (n=74)

Location	Frequency	Percentage (%)
Commercial Cyber café	43	58.1
Personal laptop	18	24.3
Work Place	16	21.6
Home	13	17.6
University Library	10	13.5
Cyber café Within the University	9	12.2
No Access to a Computer	9	12.2
Study Centre	0	0

(Multiple Responses)

Table 4: Location and Use of Computers by Distance Students at Kenyatta University (n=61)

Location	Frequency	Percentage (%)
Work place	35	57.4
Commercial Cyber café	22	36.1
University Library	21	34.4
Personal laptop	17	27.9
Cyber café Within the University	16	26.2
Home	14	23.0
Study Centre	9	14.8
No Access to a Computer	6	9.8

(Multiple Responses)

Use of Mobile Phones

On students' access to mobile phones, the study revealed similar findings in both case study organisations. At least 65 (87.8%) of the students from the UoN and 48 (78.7%) from KU had a mobile phone. However, the findings show that distance students in both institutions did not use mobile phones for accessing information services. For example, 73 (98.6%) students from the UoN and 46 (75.4%) from KU had not used a mobile phone to get information services from the university library.

E-readiness of University Libraries for Distance Learning

E-readiness is the preparedness of university libraries to use ICTs to enhance information access to distance learners thereby increasing the quality of learning, teaching and research. The key indicators of e-readiness of the university libraries considered were the ICT infrastructure, electronic communication system, electronic services, and information literacy. In addition, other factors such as budget and staffing for distance students were also considered as important. The ICT infrastructure has been discussed in the foregoing section. Inadequate ICT infrastructure indicates a low level of e-readiness in both the UoN and KU. The other factors are discussed below.

Electronic Communication with Distance Students

The findings indicate that 71 (96%) of the respondents from the University of Nairobi and 37 (60.6%) from Kenyatta University had not used e-mail to get information services from the university library. Similarly, 73 (98.6%) from the University of Nairobi and 46 (75.4%) from Kenyatta University had not used mobile phones to get information services from the university library. These findings were corroborated by interviews with the university librarians and senior library staff. Librarians from both university libraries revealed that they rarely used electronic communication with distance learners. Lack of e-communication from the libraries points to a lack of e-readiness for distance students. These findings are consistent with the findings of Akinseinde and Adomi (2004) on email usage by technical education students in Nigerian universities who found that students used email mainly to communicate with relatives, friends and course mates. Similarly, a study by Parsons (2010) established that distance learners used mobile phones mainly for communication with friends but very few students used them for educational purposes.

Electronic Services

Senior library staff interviewed from both universities revealed that there were no dedicated services for distance students. According to senior library staff from the UoN, no conscious effort was made to provide current awareness services to distance students. Kenyatta University senior library staff, however, said that the library provides current awareness via the electronic notice board and RSS feeds on OPAC on the library website. On the other hand, responses from distance students from both universities indicated that the majority were not really aware of the e-services offered by the university library apart from the OPAC. Lack of electronic services is yet another pointer to inadequate e-readiness of the case libraries.

On document delivery, the study found that the UoN library was not offering document delivery service to distance students as 70 (94.6%) of the respondents had never used this service. On the other hand, KU library was offering the service to some extent - 30 (49.2%) had used the service. This concurs with the finding by Wachira and Onyancha (2012) that document deliveries through email attachments were common at Kenyatta University. However, they were quick to add that all respondents from both universities said that users were encouraged to collect materials from the library in person. This shows a general lack of e-readiness in the provision of services by the university libraries.

Electronic Resources

The study revealed a gap in access to and use of e-resources by distance students in both case institutions. The findings indicate that 40 (54%) from the UoN and 22 (36.1%) from KU did not use the e-resources. Similarly, no respondents from the UoN used the e-resources fully (100%) and only an insignificant proportion of two (1.6%) who did so were from Kenyatta University. Figure 3 and Figure 4 show the extent of use of e-resources at the UoN and KU respectively.
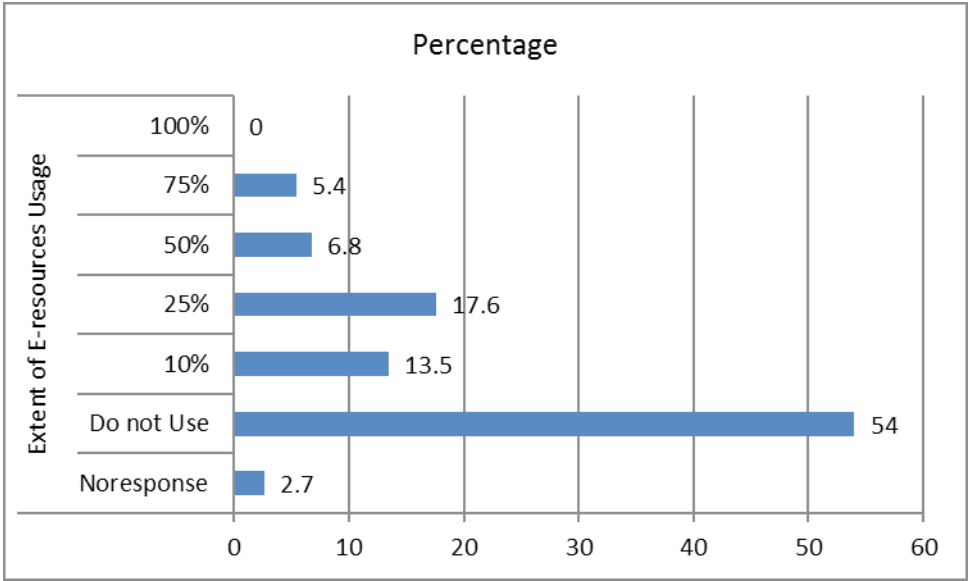
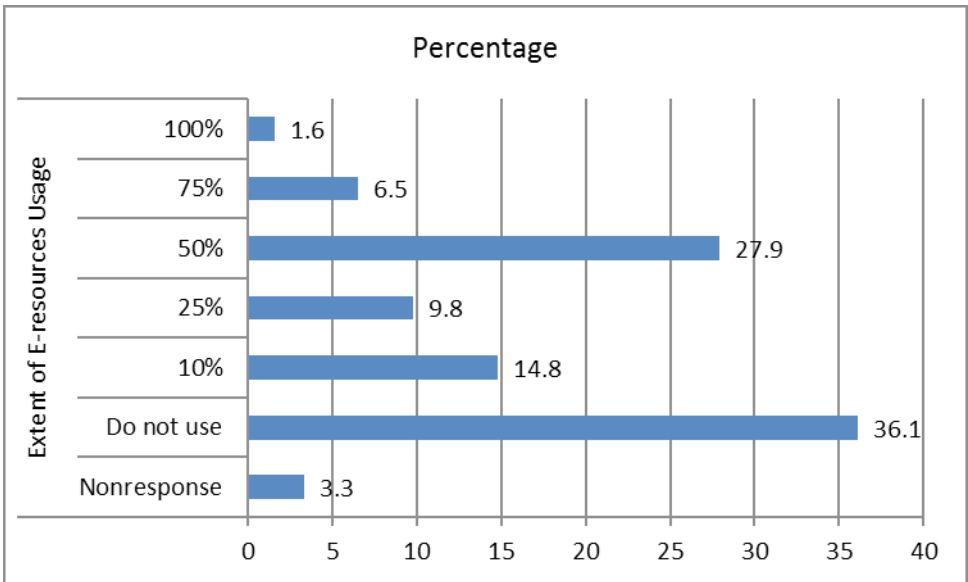*Figure 3: Extent of Use of e-resources at the University of Nairobi*

Figure 4: Extent of Use of e-resources at Kenyatta University

Source: Research data

The findings also indicate that a significant proportion of respondents in each case accessed the university library's e-resources by physically visiting the library. For example, 30 (41.1%) of students from the UoN and 29 (47%) from KU indicated that they accessed e-resources physically from the libraries. Remote access was insignificant. The study also revealed that 33 (44.6%) students from the UoN and 10 (16.4%) from KU had no access to e-resources at all. The study therefore established that access to library e-resources by distance students was limited in both UoN and KU. Table 5 and Table 6 show how distance students access library e-resources at the UoN and KU respectively.

Table 5: Access to Library E-resources by Distance Students at the University of Nairobi *(n=74)*

How Students Access E-resources	Frequency	Percentage (%)
Physically visiting the library	30	41.1
Remotely from a commercial cyber café	9	12.2
Remotely from home	4	5.4
Remotely from outside the library but within the university campus	3	4.1
Remotely from my workplace	3	4.1
Remotely from my study centre	0	0
Other	0	0
None of the above (No access)	33	44.6
No response	1	1.4

(Multiple Responses)

Table 6: Access to Library E-resources by Distance Students at Kenyatta University (n=56)

How Students Access E-resources	Frequency	Percentage (%)
Physically visiting the library	29	47.4
Remotely from a commercial cyber café	12	19.7
Remotely from my workplace	12	19.7
Remotely from my study centre	8	13.1
Remotely from outside the library but within the university campus	7	11.5
Remotely from home	4	6.6
Other	1	1.6
None of the above. I have no access	10	16.4
No response	5	8.2

(Multiple Responses)

The study revealed that the main services that distance students at the UoN used were books/journals consulted in the library. These were used three times a year by 47 (63.5%) of the respondents and physical book loans/journals used by 46 (62.2%). Similar responses were elicited from distance students at KU where a total of 37 (60.6%) used books/journals in the library and 27 (44.3%) physical book loans/journals. The majority of respondents indicated that they mainly used the study modules/units; other students used Google as an alternative source of information.

The study (from interviews with the librarians) established that the mode of access to e-resources was by IP addresses and username and password for some resources. Distance students could not have full text access to some e-resources remotely due to unavailability of remote access. There was a gap in distance students' access to the e-resources provided by the university libraries in both institutions. This is consistent with the findings by Wachira and Onyancha (2012) that established that access to e-resources by remote users from the UoN and KU was via IPs and passwords and users could access the university library from the campuses that were interconnected with a proxy server. This explains the general lack of use of e-resources by distance students and their dependence on the study modules/units and Google. The findings concur with those of Boadi and Letsolo (2004) that

the distance students' sources of information were colleagues, personal collections, co-workers and family members as they were unable to access on-campus library and information sources and services.

Information Literacy Skills of Distance Learners

The finding from the librarians was that both university libraries did not have an information literacy programme for distance students. This finding corroborates the findings from distance students that themajority of them from each case were not very proficient in online searching and that they learnt information searching skills mainly from friends or through self training. This finding is also consistent with findings of other scholars (Abdelrahman, 2012; Mabawonku, 2004). It explains why distance students mainly use the study modules/units, while others use Google as their sources of information.

Library ICT Policy for Distance Learners

Policies are important in giving guidelines on how services to distance learners should be provided. The findings indicate that there was a lack of a library ICT policy for distance learners in both case organizations. The findings concur with those of Kavulya (2004) whose findings indicated that there was a lack of institutional policies to guide the provision of information for distance learners in university libraries in Kenya. Similarly, Wachira and Onyancha (2012) found that the selected university libraries did not have policies for remote users.

Challenges Experienced By Distance Students in Accessing Information through ICTs

Poor planning of distance education programmes in both the University of Nairobi and Kenyatta University was identified as a major issue that contributed to problems encountered by distance learners. It emerged from interviews with the librarians that the library was excluded during the initial planning stages for distance education programme. The respondents also identified several challenges that distance learners experience in accessing information through ICTs. These included: lack of access to computers; high cost of accessing information through ICTs; poor Internet connectivity in rural areas; inadequate electricity in rural areas; inadequate library services at regional centres; inadequate computer skills and information literacy skills; lack of awareness of the online resources and services offered by the university library; poor communication between the university library and distance students; lack of remote access to e-resources and inadequate services at study centres. These findings from the respondents concur with those identified by various scholars in reviewed literature (Abdelrahman, 2012; Akande, 2011; Oladokun & Aina, 2011).

Conclusion

The increase in enrolment of distance learners in Kenya is calling for a paradigm shift in the provision of library services to this category of users. This can be achieved through the use of ICTs. There is need to improve both the national and the universities' ICT infrastructure to facilitate access by distance learners. Distance learners should also be facilitated to acquire suitable ICTs for accessing information. Distance students are separated from the university library by geographical locations. Provision of e-services such as book reservation, online loan renewal, online reference service, online information delivery, current awareness services and access to e-resources would address this challenge and ensure that distance students get same services from the university libraries as their full-time colleagues. This shift requires proper planning for distance students by university libraries. Adequate budget allocation to both the University of Nairobi and Kenyatta University libraries would facilitate the provision of ICT-based services and resources suitable for distance learners.

Recommendations

On the basis of the study findings, the following recommendations were made to enhance access to and use of ICTs in the provision of information to distance learners.

Involvement of Stakeholders in Planning for Distance Education

This study recommends that university management should involve the university library right from the start of planning for the distance education programmes. There should be close collaboration between the faculty, directorate of distance education, ICT staff and librarians in order to create a successful academic environment for a distance learner.

Distance Learners' Needs Assessment

Librarians should conduct needs assessment studies on distance learners in order to establish their information and communication needs. This will help librarians to develop a model of services that addresses the information needs of distance learners.

Formulation of ICT Policies

University libraries should have policies governing library services for distance learners. These should include guidelines on access to services and resources through ICTs, financial resources, staffing and physical facilities.

Provision and Improvement of the National ICT Infrastructure

The Government of Kenya, specifically the Communications Authority of Kenya (CAK) should improve the telecommunications infrastructure in the rural areas with a view to lowering Internet costs. The government should also zero-rate taxation on computers and other ICTs including mobile phones so that they can be more affordable to majority of its citizens.

Provision and Improvement of University ICT Infrastructure

There is need to improve the ICT infrastructure within universities including university libraries to ensure e-readiness for distance students. In addition, distance students should be facilitated to own laptops or tablets. This can be achieved through universities lobbying with the government for free laptops for students. If this is not possible, the university management should partner with possible sponsors such as banks and arrange for an affordable loan facility for distance students to acquire laptops.

Provision and Improvement of ICT Infrastructure at the Study Centres

The directorate of ICT should ensure that all regional centres have adequate computers and internet including WiFi. They should also ensure that the centres are linked to the main university electronically via a fiber link. The central library system should be networked with regional centres electronically to enable distance learners to access the electronic library from the regional centres. Each regional centre library should have a secure multimedia lab to be used for online searches by distance learners.

Use of Internet Enabled Mobile Phones by Distance Learners

Distance learners should be encouraged to have Internet–enabled mobile phones. This is advantageous because a mobile phone is relatively flexible in communication. If the taxation of mobile phones is reduced, then they will be more affordable.

Development of Library Portals

In order to be e-ready for distance students, university libraries should develop library portals that enable remote access. The information resources that should be posted to the library portal should include: e-books, e-journals, e-references and bibliographic databases. The e-services should include the web-OPAC, virtual reference, circulation, document delivery, online current awareness and online literacy programmes. Seamless remote access to the full–text of licensed e-resources should be enabled for instance, by installing EZProxy software. Instructions about authentication should be posted on

the university library portal. In addition, librarians should also develop an interface for a federated search for the e-resources. This would minimize the time spent having to logon to different publishers' sites.

Allocation of Adequate Resources for Distance Learners

In order to provide the ICT facilities, e-resources and services, budgetary allocation must be provided. The university management should ensure that the university library is allocated adequate budget which at the time of this research was proposed not to be below 20% of total institutional budget as stipulated by the Commission for University Education.

Provision of Library Services at the Study Centres

University librarians should expand the library to the centres and ensure that adequate information resources are provided and the full range of library services are offered at the centres.

Partnerships with Other Libraries

University libraries should partner with other libraries including the Kenya National Library Service (KNLS) to enable distance learners to use the facilities and resources of the libraries nearest to them.

Practical Implications

Distance learners will benefit from this study from improved access to information through ICTs thereby increasing the quality of their education. This study will inform university libraries in Kenya in general and the University of Nairobi and Kenyatta University libraries in particular on improving their information services for distance learners through ICTs. The findings of this study will also benefit the university management and the Kenya government in planning and management of ICTs for distance education.

References

Abdelrahman, O.H. (2012). A basic hybrid library support model to distance learners in Sudan. *Journal of Librarianship and Information Science 44* (1), 19-26. Retrieved November 14. 2012 from http://lis.sagepub.com/content/44/1/19

Akande, S. O. (2011) Computer and internet facilities use in distance education: A survey of sandwich students of University of Ado-Ekiti, Nigeria. *Library Philosophy and Practice.* (January), 1-9. Retrieved May 4, 2013 from http://unllib.unl.edu/LPP/lpp2011.htm

Akinseinde & Adomi (2004). E-mail usage by technical education students in Nigerian universities. *Library Hi Tech News,* (9), 15-20. Retrieved July 4, 2013) from http://www.emeraldinsight.com/search.htm?st1=Akinseinde+&ct=jnl&ec=1&bf=1&go=Go

Aseey, A.A. (2004) *An investigation into the process and management of distance education in Kenya: A case study of the Faculty of External Studies.* Unpublished M. Ed. Thesis. Nairobi: University of Nairobi.

Association of College and Research Libraries (2008) Standards for distance learning library services. Retrieved November 14, 2012 from http://www.ala.org/ala/mgrps/divs/acrl/standards/guidelinesdistancelearning.cfm.

Boadi, B.Y & Letsolo, P. (2004). Information needs and information-seeking behavior of distance learners at the Institute of Extra-Mural Studies in Lesotho. *Information for Development*, 20(3): 189-199. Retrieved March 28, 2013 from http://idv.sagepub.com/content/20/3/189

Commission for University Education (2012). *Standards and guidelines for university libraries in Kenya.* (Rev. ed.) Nairobi: Commission for University Education. Nairobi: CUE.

Commonwealth of Learning (2015) Open and distance education: Key terms and definitions. Retrieved November 3, 2015 from http://hdl.handle.net/11599/829

Cooper, J. L. (2000) A model for library support of distance education in the USA. *Interlending & Document Supply, 28* (3), 123-131.

Creswell, J.W. (2003) Research design: *Qualitative, quantitative and mixed methods approaches*. 2nd ed. Thousand Oaks, CL: Sage.

Kavulya, J.M. (2004) Challenges in the provision of library services for distance education: A case study of selected universities in Kenya. *Afr. J. Lib. Arch. & Inf. Sc. 14* (1), 15-28.

Kenya Education Network (2007). E-readiness survey of higher education institutions in Kenya. Retrieved September 9, 2008 from http://www.kenet.or.ke/main.php?lang=en

Kenya Education Network (2008). East African Universities Accession Project (2008) Staging results and key findings: EA Accession Project Phase I, 2008. Retrieved November 22, 2012 From http://kenet.or.ke/eready/findings_results.php

Lera-Lopez, F., Billon, M. & Gill, M. (2011). Determinants of internet use in Spain. *Economics of Innovation and New Technology*, 20 (2), 127-152. Retrieved July 1, 2013 from http://dx.doi.org/10.1080/10438590903378017

Liu, C.H. & Matthews, R. (2005). Vygostsky's philosophy: Constructivism and its criticisms examined. *International Education Journal*, 6 (3), 386-399.

Mabawonku, I. (2004). Library use in distance learning: A survey of undergraduates in three Nigerian universities. *Afr. J. Arch. & Inf. Sc. 14,* (2), 151-165.

Maclean, E. & Dew, S.H. (2008). Assessing the library needs and preferences of off-campus students. *Journal of Library Administration 41*(1-2), 265-302. Retrieved May 14, 2013 from http://dx.doi.org/10.1300/J111v41n01_20.

Minishi-Majanja, M. K. & Kiplang'at, J. (2005). The diffusion of innovations theory as a theoretical framework in library and information science research. *South African Journal of Library & Information Science, 71* (3), 211-224.

Minishi-Majanja, M.K. & Ochola, D.N. (2004). Auditing of information and communication technologies in library and information science education in Kenya. *Education for Information*, 22: 187-221.

Moyo, M.L. and Cahoy, E.S. (2003) Meeting the needs of remote library users. *Library Management, 24* (67), 281-290. Retrieved November 30, 2012 from http://www.emeraldinsight.com/0143-5124.htm

Murray, R. (2003). Information portals: casting a new light on learning for universities. *Campus-Wide Information Systems, 20* (4), 146-151.

Ndung'u, M.N., Waema, T.M. & Mitullah, W. (2012). Factors influencing usage of new technologies in low-income households in Kenya: the case of Nairobi. *Info*, 14 (4), 52-64. Retrieved July 1, 2013 from DOI 10.1108/14636691211240888

Neuman, W.L. (2006) *Social methods: qualitative and quantitative approaches*. 6th ed. Boston: Pearson.

Nwezeh, C.M.T (2010). Libraries and distance education in Nigerian universities: A revisit. *New Review of Academic Librarianship, 16* (1), 102-115. Retrieved November 30, 2012 from http://dx.doi.org/10.1080/13614530903584255

Odero-Musakali, D. & Mutula, S.M. (2007). Internet adoption and assimilation in Kenyan university libraries. *Library Review, 56* (6), 464-475. Retrieved January 30, 2009 from www.emeraldinsight.com/0024-2535.htm

Oladokun, O. and Aina, L. (2011) ODL and the impact of digital divide on information access in Botswana. *The International Review of Research in Open and Distance Learning, 12* (6), 158-177.

Oyelaran-Oyeyinka, D. & Adeya, C.N. (2004). Dynamics of adoption and usage of ICTs in African universities: A study of Kenya and Nigeria. *Technovation, 24* (10), 841-851.

Parsons, G. (2010) Information provision for HE distance learners using mobile devices. *The Electronic Library, 28* (2), 231-244.

Rogers, E.M. (1995) *Diffusion of innovations*. 4th ed. New York: The Free Press.

Rosenberg, D. (2005). Toward the digital library: findings of an investigation to establish the current status of university libraries in Africa. International Network for the availability of scientific publications (INASP), Oxford. 30 p. Retrieved November 28, 2007 from http://www.inasp.info

Wachira, M.N.& Onyancha, O.B. (2012). Serving remote users in selected public university libraries in Kenya: Discussions with section heads. Paper Presented at the SCECSAL 2012 Conference organized by the Kenya Library Association, Nairobi, 4th – 8th June, 2012.