Technological Support Servicesand Retention Of Distance Learners: A Case Of Education Programmes Of The University Of Nairobi

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Abstract: *Retaining and graduating students are paramount to the overall success of colleges and universities. Despite significant efforts on the part of many colleges and universities to increase student retention and graduation rates, these rates have remained relatively low. This study sought to establish how the provision of learner support services in the form of Technological Support Services influences the retention of distance learners at the University of Nairobi. Quantitative data was collected through structured self-administered questionnaires while qualitative was collected through focus group. The statistical tools of analysis for descriptive data were arithmetic mean and standard deviation while for inferential statistics were Pearson's Product Moment Correlation (r), simple regression, multiple regressions and F-tests were used to test hypotheses in the study. Hypotheses test was done and results concluded that Technological Support Services had a statistically significant influence on the retention of distance learners at the University of Nairobi.The study made several recommendations among them being that managers of the distance learning programmes needed to improve the ICT infrastructure that was available in most of the learning centres that were located outside the main Chiromo Campuses in order to provide better services to the learners. That available Media and Technology to be explored and utilized at maximum extent in order to enhance the quality of Distance Education in all the learning centres and sufficient funds to be allocated to distance mode of education to procure modern technology.*
Keywords: *Access to online resources, Access to library, Call Centre, Communication by SMS, ICT Competence, Technological Support Services, Retention of distance learners*

I.   Introduction

The mode of delivery for most ODL programmes is by-and-large print (modules), in conjunction with face-to-face tutorials, telephone contacts, emails and one-on-one contact with tutors as and when needed.Valentine el al, (2011) observed that before the advent of Internet technologies, distance education was mainly delivered via radio and television in addition to sending audio tapes and by sending lessons through the mail. The Open University UK, which has led the way and perhaps set the standards for ODL, offers its content in both print and electronic forms. According to Gourley and Lane (2009), apart from making its published materials public for students and the public to buy, the Open University UK had a powerful partnership with the British Broadcasting Corporation for several decades where lectures were broadcast to the public across the world. Technology used in online learning and distance education has profound effects on the learning experience. Thomas and Eryilmaz (2014) established that different software used to deliver instruction and manage interaction had an impact on satisfaction, student-student interaction, and the learning community, implying an effect on student-student transactional distance. Howard, Ma, and Yang (2016) found that computer self-efficacy was one of two main factors related to positive and negative engagement with digital technologies.

In most countries, distance learning has been updated into technology-enabled learning environments, where e-Learning scenarios, ubiquitous technologies, Cloud Computing, simulation, gaming, and personal learning environments have become the mainstream (Morley, 2012; Moller and Huett, 2012). However, in this new and complex circumstance, advanced ICT itself cannot naturally bring about quality learning process or

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directly lead to good achievement of students learning. For students to have quality learning process and good achievement, ICT has to be well integrated into various learning procedures (e.g. course instruction, learner support and assessment). Further, the learner experiences with robust interactions between learners and content in the design of the learning process should be carefully designed in the technology-enabled learning environments. The introduction of the internet has revolutionized the way institutions, especially universities, deliver credit and non-credit distance courses to students. Bower and Hardy (2004) and Kudryavtseva (2014) demonstrate that the internet, through its ability to offer both asynchronous as well as synchronous activities, has become an excellent platform for conducting DE through chat sessions and online discussions which can be used to engage learners in student-to-student, as well as, student-to-instructor interactions. This is perhaps the reason Kudryavtseva (2014) identifies the internet as one of the facilities necessary for the effective delivery of lessons in ODL programmes. Likewise, Ekwunife-Orakwue and Teng (2014) argue that modalities of DL that leverage interaction, and allow seamless experiences with technologies will continue to thrive and proliferate.

The use of various types of technologies by adult learners was evident in some ODL programmes in Southern Africa. This is the case where short messaging (SMS) mobile phone technology was used to support distance learners, supplementing print and face-to-face contact (Aluko, 2009; Beukes, 2009; Fresen and Hendrikz, 2009). In Uganda, Kajumbula (2006) found that, with mobile phone software, Makerere University was able to give administrative support to distance learners such as on new dates for submitting assignments. Using a one lecturer experience of using texting with her students, Horstmanshof (2004) has shown how SMS can effectively be used to support and encourage students to persist in a programme. The informal nature of SMS, according to Horstmash of, is necessary as it fosters the sense of belonging and student integration in the university community, faculty support, peer support and classroom comfort. With a similar objective in student support, the University of Wolverhampton invested in a large-scale scheme that uses bulk SMS texting to enhance student support, inclusion and retention (Riordan and Traxler, 2005). Harry, Akosua and Owusu (2018) also noted that text messaging and direct voice calls, though basic, are effective tools for communication in distance education institutions. In the case of direct voice calls, distance education students are provided with the opportunity to call back and seek for further enquires.

Unlike the developed nations, the developing nations are in a unique situation with regards to the use of technology in teaching and learning across all levels of education. While the telecommunication infrastructure has made mobile phone utility possible in many remote parts of Africa, its use in scaling up success rate of ODL learners is yet to be tested. Recent findings indicate that learners' support by mobile phone is possible primarily on administrative and consultation matters. However, the small storage capacity and screen of the mobile phones that are affordable make them ineffective for serious academic work. The larger screen smartphones are as good as laptops but they are expensive for low income distance learners.(Maritim and Mushi, 2011).

Due to the high penetration of mobile phones that has been made in Africa and the fact that many learners in collages own them it is upon institutions to take advantage of this to enhance teaching and learning. This is more relevant to distance education students who often have problems in terms of a lack of personal contact with the institution, a sense of isolation, a lack of pre-course orientation and of tutor support counselling sessions. Mobility allows teaching and learning to extend beyond the traditional classroom and support learning experiences that are collaborative, accessible and integrated with the world beyond the classroom. According to Hendrikz and Aluko (2011), the inability of institutions to use a form of technology to students' advantage that is available to them to enhance teaching and learning could be said to amount to an injustice. In a study carried out at University of Pretoria Hendrikz and Aluko (2012) demonstrated that it was possible to use SMS technology to support students academically in a limited way, bearing in mind some variables, which include the commitment of the students, family support, their attendance at contact sessions and their personal circumstances. Furthermore the study also showed that students who received the SMS messages were academically more active than those who did not. In addition students were sent SMSs before each tutorial session regarding the chapters to be discussed during the session. This was done to give guidance to students on what to prepare for before the discussion and evidence showed these learners were motivated to attend and contribute to the discussions during the sessions. Thus, it is possible for students to receive some form of academic support through the use of mobile technology.

Mobile learning has also been used in ODL institutions to enhance retention. Fozdar and Kumar (2007) and Cook (2006) established that mobile learning was related to improved student retention. The biggest advantage of this technology is that it can be used anywhere, anytime. Moreover, as mobile phone usage expands, it offers DL institutions easy access to a larger number of learners (Fozdar and Kumar, 2007). Butale, 2008; Kamau, 2004; Wright and Reju, 2009 demonstrated that distance learners had either limited or no access to computer laboratories and equipment. This reported lack of access to resources seems contrary to Bates' ACTIONS model (Bates, 1992), in which the author argues that at the programme implementation stage, providers should evaluate learners' technological needs in terms of accessibility, costs, teaching appropriateness, organizational changes required, novelty and speed. Ng'umbi, (2009); and Mnyanyi, et al. (2010) reported that

students of Open University of Tanzania have been using mobile phones to facilitate communication among them and regional centres staffs and to read online materials despite the hidden cost to students and small capacity of their phones to read some documents like PDF files. However, Nihuka and Voogt (2011) found that despite that mobile phones are owned by majority of students and instructors, both instructors and students confirmed that those mobile phones are not used for delivery of courses and communication. This gives the impression that mobile phones facilitate communication among students themselves and regional centres, by means of administrative staff and not their instructors. Emails have been used in China to facilitate communication among students themselves and their instructors, to submit assignments to their teachers and to post e-learning materials for students to read (Lee, 2004; Cai and Guo, 2006).

The provision of quality library services to those who learn at a distance is undoubtedly one of the most exciting and challenging developments that have occurred in contemporary librarianship. DE has led to the development of specialized library and information services that can appropriately be called distance librarianship. The genesis of distance librarianship is grounded in the creation of the large-scaled spread of distance education to satisfy personal and national educational goals. Oladokun, (2002), observed that except for a handful of university libraries, library support service to distance learners is almost non-existent. Groeling and Boyd (2009) noted that the library is no longer simply a physical building with four walls. Libraries continue to undergo tremendous transition as they move to virtual services in response to changes in technology and the expectations of the users. Librarianship is changing from managing books to connecting people and quality resources while at the same time delivering resources efficiently and providing the best customer service possible. The emphasis is shifting from what librarians do to how they do it. In a digital world, resources are becoming more of a commodity. The academic librarian provides added value to the teaching and learning process. Today, digital literacy lies at the heart of the mission of all libraries. Studies such that of Parker (2011), have noted that when it comes to the development of suitable programmes of library services for ODL, there is opportunities for lots of improvements in IT infrastructures, enhancement of integrated library management systems, efficient services, development of offline information literacy programmes, staff training programmes and acquisition of e-resources. The goal is to transform the library ODL environment into active catalyst for information retrieval and dissemination that will cater for the needs of staff and students beyond their geographical boundaries.

The importance of regional centres (Kember and Dekker, 1987; Leach, 1996) has been conceptualized in a notion of provision of a local human interface of DL. Regional centres have the potential for providing tutorials by faculty members, study group meetings and resources such as the library and ICTs (Cutting, 1989). Through regional centres learners could address the feeling of isolation (Lowe, 1997), not virtually but physically, as new DL students are usually desperate for human contact, not just for information from others (Walker, 2002).

II.   Statement Of The Problem

The retention of learners is regarded as one of the most important aspects in higher education. Whilst distance education has experienced tremendous growth over the years, it still suffers one fundamental weakness, the high drop-out rate experienced by its students as compared with the drop-out rate of students in conventional education. In highly selective universities, this means that 8 percent of students leave after the first year and 4 percent after the second year and in less selective universities, these estimates are grater at 35 percent and 17 percent respectively. These numbers underscore the continued need for retention efforts in the second year. Indeed studies have shown that the retention needs of students in the second year are different from those of the first year (Ishitani, 2016). The importance of learner support services in overcoming this weakness cannot therefore be overestimated. Several studies have demonstrated that learner support services can provide a vital resource for students experiencing difficulties, particularly in the first year and enhance their persistence (Boettcher, 2004; McCracken, 2004 and Palloff and Pratt, 2003). These studies have pointed to the fact that there is a strong and positive correlation between learner support services and learner retention.

At the University of Nairobi the average attrition rate is about 15 percent for the Bachelor of education (Arts) Bachelor of education (science) for distance learners in their first and second year. This average is lower than those usually reported in many of the studies that have investigated retention in higher education meaning that the university has put in place some measures that have resulted in better retention rates. Despite these gains, there still exists a gap in what organizations knowand what they effectively doin terms of improving student progress. In terms of learners' retention little empirical research has been devoted to the gains of learner support services as it contributes overall in helping learners persist especially during their first and second year of study. Apart from the studies linking learner support with academic success or recruitment (Bowa, 2008; Muchiri, 2012; Getuba, 2012; Gakuu, 2013) there has been relatively scant research specifically focused on how learner support affects student persistence within specific contexts, specifically at the University of Nairobi and also among the distance learning programs offered at the University. This study therefore intended to fill this

gap by investigating the influence of Learner Support Services on the retention of distance learners at the University. Specifically the study intended to determine whether learner support services in the form of Technological Support Services, does assist distance learners' persistence.

Specific Objective Of The Study
To determine the influence of Technological Support Services on the retention of distance learners at the University of Nairobi.

Delimitations Of The Study
This study focused on distance learners at the University of Nairobi in two programs offered under the ODeL mode and specifically those who are in their first two years of college. These two programs are the Bachelor of Education (Arts) and the Bachelor of Education (Science) mainly focusing on those Learners who use printed materials as their key learning resource and attend residential sessions for limited face-to-face contact with their tutors. These responses therefore may differ from those of students in other types of programmes and also students who are in their third and fourth year of study at the University of Nairobi. Sampled learners included those from the main campuses in Nairobi and Chiromo, Kisumu Campus, and four learning centres based in Kisii, Meru, Kakamega and Eldoret.

Research Methodology
The purpose of this study was to determine the influence of learner support services in the form of technological support services on the retention of distance learners at the University of Nairobi. Being a descriptive cross sectional research design, the ontological orientation of the study is that of the realist assumption. In descriptive cross sectional research design information is recorded as it is present in the population and the researcher does not manipulate variables (Mohamed and Oso, 2014). This study employed triangulation involving a cross-sectional survey design. The questionnaire was the main tool for collecting data. Focus group discussions (FGDs) were also conducted to provide information of learners' perceptions, feelings, and attitudes towards their academic experiences as distance learners. For descriptive statistics means and standard deviations were computed for each variable.

Target Population
The target respondents were made up of 1521 undergraduate students from two different programs from the academic years 2015/2016 and 2016/2017 who were first year and second years. These two programs are the Bachelor of Education (Arts) and Bachelor of Education (Science).

Table 1 Target Population

Program	No. of Students/Gender						
	First Year			Second Year			Grand Total
	Male	Female	Total	Male	Female	Total	
B.Ed. Arts Nairobi	215	126	341	76	67	143	484
Kisumu	24	34	58	34	32	66	124
Kisii	39	25	64	41	32	73	137
Eldoret	27	32	59	22	21	43	102
Kakamega	45	35	80	19	30	49	129
Meru	16	15	31	21	19	40	71
B.Ed. (Science) Nairobi	138	58	196	187	91	278	474
Total	504	325	829	400	292	692	1521

Source (Records Office, SODL, ODeL Campus, U.O.N, 2017)

SAMPLE SIZE
Using the Krejcie and Morgan (1970) formula, the sample size was computed as follows;

$$s = \frac{x^2 \, NP \, (1 - P)}{d^2(N - 1) + \, x^2 P(1 - P)}$$

Where; s = required sample size.
N = the population size (1521)
P = the population proportion (assumed to be .50 since this would provide the maximum sample size)

d = the degree of accuracy expressed as a proportion (.05)

$$s = \frac{(3.84)(1521)(0.5)(1-0.5)}{(0.0025)(1521-1)+(3.84)(0.5)(1-0.5)}$$

$$n = \frac{1460.16}{3.8+0.96};$$

n = 306.7563025~307

With the sample size determined, proportional allocations was adopted to distribute the respondents among the students' categories aiming to have at least 20 percent representation from each strata as shown in Table 2.

Thus $\frac{307}{1521}$ **X 100 = 20.184 = 20%**

The total sample size selected was therefore 309.

Table 2 Sample Size

Program	No. of Students/Gender						
	First Year			**Second Year**			
	Male	**Female**	**Total**	**Male**	**Female**	**Total**	**Grand Total**
B.Ed. Arts							
Nairobi	43	25	68	15	14	29	97
Kisumu	5	7	12	7	7	14	26
Kisii	8	5	13	8	7	15	28
Eldoret	6	7	13	5	4	9	22
Kakamega	9	7	16	4	6	10	26
Meru	3	3	6	4	4	8	14
B.Ed. (Science) Nairobi	28	12	40	38	18	56	96
Total	102	66	168	81	60	141	309

Source (Records Office, SODL, ODeL Campus, U.O.N, 2017)

QUESTIONNAIRE RETURN RATE

Out of 309 questionnaires administered, 249 questionnaires were filled and returned which represented a response rate of 81 percent.

Table 3 Responserate and distribution of respondents

Program Location	Sample size	No of Respondents	Percentage
B.Ed. Arts Nairobi	97	91	94%
B.Ed. Arts Kisumu	26	20	77%
B.Ed. Arts Kisii	28	12	43%
B.Ed. Arts Eldoret	22	22	100%
B.Ed. Arts Kakamega	26	18	69%
B.Ed. Arts Meru	14	7	50%
B.Ed. Science	96	79	82%
Total	309	249	81%

III.   Data Collection And Data Analysis

A research clearance letter was obtained from the University of Nairobi and later obtained a research permit from the National Commission for Science, Technology and Innovation. Seven research assistants were identified, recruited and trained for two days on the aspects of handling respondents and the ethical conduct of research. They were also taken through each item on the questionnaire so that they would be able handle any concerns that may arise from the respondents and also on how to conduct Focus Group Discussions (FGDs). A follow up time schedule for questionnaires was also agreed on with the research assistants to increase the questionnaire return rate. Qualitative data was collected from the seven regions through FGDs administered by the researcher himself. Each FGD was composed of between six and eight students picked randomly. These discussions run for between 60 to 90 minutes. Additional qualitative data was also gathered by the researcher through the observation schedule while conducting the FGDs and also upon a visit to some of the learning centres. Research assistants helped in collecting information from the other learning centres.

This research study collected both quantitative and qualitative and employed both descriptive and inferential data analysis methods in conformity with the pragmatism paradigm. All the data was keyed into the

statistical package for social sciences (SPSS) version 24.0 specification. For descriptive statistics means and standard deviations were computed for each variable. In addition nine separate Analysis of Variance (one-way ANOVA) were conducted to answer the research questions.

Validity And Reliability Of Research Instruments

Validity is regarded to be the most critical criterion of sound measurement and indicates the degree of which an instrument measures what it purports to determine. Evidence of validity is provided by several sources. The main instrument for this study, the questionnaire, was evaluated for content, face and construct validity. The content validity of the questionnaire was determined by the literature review to identify the key indicators as well as by the judgments of my supervisors. Face validity of the instrument was determined through examination of the questionnaire by research experts from the University of Nairobi, especially those who have conducted research in DL and again with guidance from the researcher's supervisors, both who are experts in the field of distance learning. According to Mugenda (2011), construct validity is concerned with the extent to which a particular measure relates to other measures in a way that is consistent with theoretically derived hypothesis concerning the concept. The estimation of construct validity requires a researcher to establish theoretically derived hypothesis involving the concept under consideration. This has been ensured in this study since the hypotheses that have been developed for testing have been derived for the key indicators of the independent variables based on the study objectives which have been developed from literature review and are also related to the respective questionnaire items.

The Cronbach's Alpha is the most commonly used coefficient of measuring internal consistency of research instruments. The choice of this technique was informed by the fact that the technique does not require either splitting of a scale or the subjects re-taking the test for given construct. The scale gives positive results ranging from zero to one. The closer the coefficient is to one the greater the internal consistency of the items in the Likert scale and describes the extent to which all the items in the instrument measure the same concept or construct and hence it is connected to the inter-relatedness of the items within the instrument. A test score of 0.7 is prescribed as a cut off or benchmark for items to be included in the study (Cronbach and Richard, 2004).The results of the Cronbach's Alpha reliability coefficient was 0.817.

IV. Findings And Discussions Of The Study

This study sought to assess the influence of Technological Support Services influence on the retention of distance learners at the UON.

Distribution of the Respondents by Year of Study

Findings presented in table 4 show the distribution of the respondents by Year of Study. The data reveal that 48.2 percent of the respondents were in their first year of study and 51.8 percent in second year. Distribution of respondents by year of study was meant to ensure that students who were in their first and second year of study were equally represented in the study. Several studies such as Noel-Levitz (2008), McFarlane (2013), Simpson (2004), Allen, Smith and Muehleck (2013), have all noted that distance learners are most vulnerable and more likely to drop out college during the first two years of study.

Table 4 Distribution of the Respondents by Year of Study

Year of Study	Frequency	Percentage
First Year	120	48.2
Second Year	129	51.8
Total	249	100

Distribution of Respondents by Ownership of Computer, Tablet and Mobile Phone

Given that distance learning entails the separation of teacher and learner throughout the length of the learning process. This separation necessitates the use of technical media such as print, audio, video or computer in order to unite teacher and learner. This study therefore desired to determine whether the respondents had access to a computer, ownership of tablet and phone and the findings are presented in table 5.

The results indicate that 79.5 percent of the respondents owned a computer, 89.2 percent owned a tablet, and 98 percent owned a phone, and of those who owned a phone, 91.6 percent said it was a smart phone. Owning a smart phone was important since the learners could use it to access their email or to download content form the internet that was relevant to their course. Normally the university send the learners text messages to inform them when they need to report for residential sessions, to remind them to pay their tuition fee and register for the semester, dates for the continuous assessment tests, etc. This information would also be posted on the college website. Smart phones are also important since they allow students to register for their course units and also have access to their results online. Majority of the respondents 84.7 percent acknowledged receiving text messages from the university. Those who did not receive the messages did acknowledge that it was an inconvenience when such information did not reach them, but their colleagues would pass the

information to them. They also reported that the failure for them to receive communication was that the university at that time did not have the correct mobile phone number and hopefully given that they had given the right information that they will be receiving communication from the university through Sms.

Table 5: Distribution of Respondents by Ownership of Computer, Tablet and Mobile phone

Ownership of a Computer	Frequency	Percent
No	198	79.5
Yes	51	20.5
Total	249	100.0
Ownership of a Tablet	Frequency	Percent
No	222	89.2
Yes	27	10.8
Total	249	100.0
Ownership of Phone	Frequency	Percent
No	5	2.0
Yes	244	98.0
Total	249	100.0
Whether it's a smart phone	Frequency	Percent
No	21	8.4
Yes	228	91.6
Total	249	100.00
Receive text message from University	Frequency	Percent
No	38	15.3
Yes	211	84.7
Total	249	100.0

Descriptive analysis of influence of Technological Support Services on the Retention of Distance Learners

Thirteen items were developed in the self-administered and respondents were requested to indicate the extent to which they agree with the statement and the results are presented in table 6. The means and standard deviations were also computed and are presented in table 7.

Table 6: Frequencies and Percentages for Technological Support services

Statement	SA F %	A F %	N F %	D F %	SD F %
1a. Students have access to online resources.	79 (31.7)	88 (35.3)	26 (10.4)	15 (6.0)	41 (16.5)
1b. My regional centre has computers	82 (32.9)	105 (42.2)	21 (8.4)	21 (8.4)	20 (8.0)
1c. Computers at the regional centres are connected to the internet	77 (30.9)	74 (29.7)	25 (10)	32 (12.9)	41 (16.5)
1d. My regional centre has WIFI facility	65 (26.1)	48 (19.3)	23 (9.2)	51 (20.5)	62 (24.9)
16e. I know how to use a computer	110 (44.2)	108 (43.4)	6 (2.4)	21 (8.4)	4 (1.6)
1f. Where I live we have access to electricity supply.	114 (45.8)	96 (38.6)	9 (3.6)	16 (6.4)	14 (5.6)
1g. I receive communication by SMS	105 (42.2)	97 (39.0)	16 (6.4)	17 (6.8)	14 (5.6)
1h. The university uses social media to communicate important information	101 (40.6)	106 (42.6)	22 (8.8)	10 (4.0)	10 (4.0)
16i. My Regional centre has a library	129 (51.8)	85 (34.1)	18 (7.2)	11 (4.4)	6 (2.4)
1j. I am able access digital materials from the regional centre library	57 (22.9)	50 (20.1)	44 (17.7)	51 (20.5)	47 (18.9)
16k. There is a call centre that one is able to call any time for support	44 (17.7)	42 (16.9)	52 (20.9)	48 (19.3)	63 (25.3)
1l. I frequently use social media in my communications with my colleagues	98 (39.4)	95 (38.2)	30 (12.0)	11 (4.4)	15 (6.0)
1m. I can access my results from my phone.	104 (41.8)	91 (36.5)	26 (10.4)	10 (4.0)	18 (7.2)

In item 1a respondents were required to indicate whether students have access to online resources. Study findings indicate that a majority of the learners 88 (35.3%) agreed, 79 (31.7%) strongly agreed, 26 (10.4%) neither agreed nor disagreed, 15 (6.0%) disagreed, while 41 (16.5 %) strongly disagreed with the statement. The mean score and the standard deviation for this item were 3.598 and 1.4111 respectively. This result implies that learner's agreed with the statement.

In item 1b respondents were required to indicate whether their regional centre had computers. Study findings indicate that a majority of the learners 105 (42.2%) agreed, 82 (39.9%) strongly agreed, 21 (8.4%)

neither agreed nor disagreed, 21 (8.4%) disagreed, while 20 (8.0 %) strongly disagreed with the statement. The mean score and the standard deviation for this item were 3.835 and 1.2052 respectively. This result implies that learner's agreed with the statement.

In item 1c respondents were required to indicate whether computers at the regional centres were connected to the internet. Results indicate that a majority of the learners 77 (30.9%) strongly agreed, 74 (29.7%) agreed, 25 (10.0%) neither agreed nor disagreed, 30 (12.9%) disagreed, while 41 (16.5%) strongly disagreed with the statement. The mean score and the standard deviation for this item were 3.458 and 1.4561 respectively. This result implies that learner's agreed with the statement.

In item 1d respondents were required to indicate whether their regional centre had WIFI facility. Study findings indicate that a majority of the learners 65 (26.1%) strongly agreed, 48 (19.3%) agreed, 23 (9.2%) neither agreed nor disagreed, 51 (20.5%) disagreed, while 62 (24.9%) strongly disagreed with the statement. The mean score and the standard deviation for this item were 3.458 and 1.4561 respectively. This result implies that learner's agreed with the statement.

In item 1e respondents were required to indicate whether they knew how to use a computer. This item wanted to establish if the respondents had computer skills. Study findings indicate that a majority of the learners 110 (44.2%) strongly agreed, 108 (43.4%) agreed, 6 (2.4%) neither agreed nor disagreed, 21 (8.4%) disagreed, while 4 (1.6%) strongly disagreed with the statement. The mean score and the standard deviation for this item were 4.201 and 0.9545 respectively. This result implies that learner's strongly agreed with the statement.

The results for items 1a, 1b, 1c, 1d and 1e were confirmed during FGDs and also using the observation schedule. One respondent, a second year female student said:

"I know how to use a computer and I am able to access online resources which have been very useful to me when it comes to assignments and also reference books. My regional centre is Kisumu Campus and it has a computer lab, internet connectivity, and even WIFI. I am also able to access most of my study modules online."

Another respondent, a second year male student said:

"I am computer literate, and I know how to use a computer, and I actually own one. My regional centre is Eldoret. The learning centre has a computer room but with only four computers. These computers are not connected to the internet, and therefore, I am not able to have access to online resources. There centre does not have WIFI and I am asking the university to facilitate because we have paid computer fee yet we have very few computers and no internet, yet our counterparts in Nairobi and Kisumu enjoy such facilities which I think is unfair."

These findings agree with those by (Thomas and Eryilmaz, 2014;Sun, 2016; Howard, Ma, and Yang, 2016; Morley, 2012; Robison and Huett, 2012) whose studies demonstrated that the technology used had a positive impact on retention. Howard, Ma, and Yang (2016) found that computer self-efficacy determined the kind of attitude that a learner would have towards the use of information technology. Hence learners who were conversant with the use of computers were more likely to appreciate the use of ICT technology and the internet to enrich their learning experience.

From the observation schedule the study confirmed that in Kisumu Campus, there was a large computer lab that had more than 40 computers, which were connected to the internet. The Campus is also WIFI enabled, which enables learners with laptops, tablets and smart phones to download information from the internet without having to buy data bundles. Most of the leaners were able to use the computers for research and do their assignments. In Eldoret, there is a room that acts as a computer lab, and has only four computers. The computers have not been connected to the internet, and their UPSs are also faulty, hence they have limited use for the learners. Therefore learners in Eldoret do not have access to online resources. The centre has a modem that is used only for the office.

In item 1f respondents were required to indicate whether they their homes had access to electricity supply. This item wanted to establish if the respondents were able to study during the night given that most of them were at their places of work during the day. Study findings indicate that a majority of the learners 114 (45.8 %) strongly agreed, 96 (38.6%) agreed, 9 (2.4 %) neither agreed nor disagreed, 16 (6.4 %) disagreed, while 14 (5.6 %) strongly disagreed with the statement. The mean score and the standard deviation for this item were 4.224 and 1.0005 respectively. This result implies that learner's strongly agreed with the statement.

From the FGDs, majority of the learners agreed that their homes were connected to electricity. One respondent, a second year male student said:

"I come from Machakos County and we have electricity connections in many parts of the County and ever some remote places away from the town, hence I am able to study at night. The government has tried to ensure all areas of the County have electricity connections through the last mile project implemented by Kenya Power ltd."

In item 1g respondents were required to indicate whether they receive communication by SMS from the university. This item wanted to establish whether the university does use bulk SMS to communicate with the

learners. Study findings indicate that a majority of the learners 105 (42.2 %) strongly agreed, 97 (39.0%) agreed, 16 (6.4 %) neither agreed nor disagreed, 17 (6.8 %) disagreed, while 14 (5.6 %) strongly disagreed with the statement. The mean score and the standard deviation for this item were 4.052 and 1.1258 respectively. This result implies that learner's agreed with the statement. This result can be confirmed by the information presented in table 2 where it was established that 98 percent of the respondents owned a phone, and of those who owned a phone, 91.6 percent said it was a smart phone. Table 2 also confirms that majority of the respondents, 84.7 percent acknowledged receiving text messages from the university. Those who did not receive the messages did acknowledge that it was an inconvenience when such information did not reach them, but their colleagues would pass the information to them.

In item 1h respondents were required to indicate whether the university uses social media to communicate important information. This item wanted to establish whether the university does use popular social media to communicate with the learners. Study findings indicate that a majority of the learners 106 (42.6 %) agreed, 101 (40.6 %) agreed, 22 (8.8 %) neither agreed nor disagreed, 10 (4.0 %) disagreed, while 10 (4.0 %) strongly disagreed with the statement. The mean score and the standard deviation for this item were 4.116 and 1.0033 respectively. This result implies that learner's agreed with the statement and from the FGDs, it was revealed that WhatsApp was the most popular social media that was used for communication between the administration and the students. One respondent, a first year female student said:

"I belong to a WhatsApp group that was created by one administrator at the university for all students who are in my year (part two). The administrator is able to post information for all students who are in that part, mostly posted are residential schedules, class timetables, examination timetables, registration information , assignments that an instructor wished to pass to a particular class in that group, among others."

Findings from items 1g and 1h agree with the studies of (Aluko, 2009; Beukes, 2009; Fresen and Hendrikz, 2009; Kajumbula, 2006; Horstmanshof, 2004; Harry, Akosua and Owusu, 2018; Maritim and Mushi, 2011, Hendrikz and Aluko, 2012), which observed that short messaging (SMS) mobile phone technology was used to support distance learners, supplementing print and face-to-face contact. Furthermore the study also showed that students who received the SMS messages were academically more active than those who did not.

In items 1i and 1j the study wanted to establish whether the learning centres had libraries that were digital. In item 16i respondents were required to indicate whether their regional centre had a library. Study findings indicate that a majority of the learners 129 (51.8 %) strongly agreed, 85 (34.1 %) agreed, 18 (7.2 %) neither agreed nor disagreed, 11 (4.4 %) disagreed, while 6 (2.4 %) strongly disagreed with the statement. The mean score and the standard deviation for this item were 4.285 and 0.9520 respectively. This result implies that learner's strongly agreed with the statement.

In item 1j respondents were required to indicate whether they were able access digital materials from the regional centre libraryStudy findings indicate that a majority of the learners 57 (22.9 %) strongly agreed, 50 (20.1 %) agreed, 44 (17.7 %) neither agreed nor disagreed, 51 (20.5 %) disagreed, while 47 (18.9 %) strongly disagreed with the statement. The mean score and the standard deviation for this item were 3.076 and 1.4418 respectively. This result implies that learner's neither agreed nor disagreed with the statement.

Results from the two items 1i and 1j were confirmed by FGDs and also from observation. From three regional centres, Kisii, Meru and Eldoret, the study was able to establish the following:
One respondent, a second year female student from the Kisii learning center said:
"There is library and a computer lab that has a few computers. The library is connected to the internet and I am able to access E- resources."
A second respondent, a second year male student from Meru learning centre said:
"We do not have a library, and learners are normally referred to the Kenya National Library which is nearby, though I do not understand why a university that calls itself world class would not have its own library. There is a computer room that has very few computers and there is no internet connection. Hence it is not possible for the students from this region to benefit from E- resources."
 A third respondent, first year male student from the Eldoret learning centre had this to say:
"There is a room that acts like a library, it has limited space and there is no connection to the internet, learners are not able to access E- resources. Given that we are many students, we are requesting the university to provide us with a digital library."
In item 1k respondents were required to indicate if there was a call centre that one is able to call any time for support. Results indicate that a majority of the learners 63 (25.3 %) strongly disagreed, 48 (19.3 %) disagreed, 52 (20.9 %) neither agreed nor disagreed, 44 (17.7 %) strongly agreed, while 42 (16.9 %) agreed with the statement. The mean score and the standard deviation for this item were 2.823 and 1.4343 respectively. This result implies that learner's neither agreed nor disagreed with the statement. Results from the two item 16k were confirmed by FGDs; A second year male student said;
"I have never heard about the call center, do we have one…"

This appeared to be the generalview among most of the respondents. However, the few that had used it said that most of the times the calls go unanswered or they are referred elsewhere for assistance.

"I tried calling on a week day and on a Saturday and when on both times my calls were not answered, I never called back…….I just gave up"

Another student said; "When I called I wanted to find out about reporting dates for the residential and I was referred to Kikuyu, where I got the information form the course administrator. The lady I spoke with was quite helpful"

In item 1l respondents were required to indicate whether they frequently use social media to communications their colleagues. Study findings indicate that a majority of the learners 98 (39.4 %) strongly agreed, 95 (38.2 %) agreed, 30 (12.0 %) neither agreed nor disagreed, 11 (4.4 %) disagreed, while 15 (6.0 %) strongly disagreed with the statement. The mean score and the standard deviation for this item were 4.004 and 1.1126 respectively. This result implies that learner's agreed with the statement.

From the FGDs it was established that majority of the learners used social media, especially WhatAsps to communicate to their colleagues. Most of the learners had joined WhatAsps groups that were used to communicate important information. In this forum students received updates on their course from university administrators, used the forum to raise issues of concerns about their course, share notes and class handouts, share term paper questions and also past examination papers.

In item 1m respondents were required to indicate whether they can access their results from their phones. Study findings show that a majority of the learners 104 (41.8 %) strongly agreed, 91 (36.5 %) agreed, 26 (10.4 %) neither agreed nor disagreed, 10 (4.0 %) disagreed, while 18 (7.2 %) strongly disagreed with the statement. The mean score and the standard deviation for this item were 4.016 and 1.1569 respectively. This result implies that learner's agreed with the statement.

Table 7 provides a summary of Means and Standard Deviations of Technological Support Services and the Composite mean 3.651 and Standard deviation 1.1126 respectively. The implication of this result is that the respondents agreed that Technological Services was important to the learners and as was observed.

Table 7: Means and Standard Deviations of Technological Support Services

Statement	N	Mean	SD
1a. Students have access to online resources.	249	3.598	1.4111
1b. My regional centre has computers	249	3.835	1.2052
1c. Computers at the regional centres are connected to the internet	249	3.458	1.4561
1d. My regional centre has WIFI facility	249	3.012	1.5644
1e. I know how to use a computer	249	4.201	0.9545
1f. Where I live we have access to electricity supply.	249	4.224	1.0005
1g. I receive communication by SMS	249	4.052	1.1258
1h. The university uses social media to communicate important information	249	4.116	1.0033
1i. My Regional centre has a library	249	4.285	0.9520
1j. I am able access digital materials from the regional centre library	249	3.076	1.4418
1k. There is a call centre that one is able to call any time for support	249	2.823	1.4343
1l. I frequently use social media in my communications with my colleagues	249	4.004	1.1126
1m. I can access my results from my phone.	249	4.016	1.1569
Composite mean and Standard deviation		3.651	1.1126

Relationship between Technological Support Services and Retention of Distance Learners

In an attempt to establish the relationship between Technological Support Services and Retention of Distance Learners correlation analysis using Pearson's product moment technique was carried out and the results are presented in table 8.

Table 8: Correlation of Technological Support Services and Retention

		Learner RT	Technological Support
Learner RT	Pearson Correlation	1	.484**
	Sig. (2- tailed)		.000
	N	249	249
Technological SS	Pearson Correlation	.484**	1
	Sig. (2- tailed)	.000	
	N	249	249
** Correlation is significant at the 0.01 level of significance (2-tailed)			

Findings from table 8 show that there is a significant positive relationship between Technological Support Services and Retention of Distance Learners (r= 0.484, p-value = 0.000). This implies that there is a moderate and positive association between Technological Support Services and Retention of Distance Learners which is significant.

Inferential analysis of Technological Support Services and Retention of Distance Learners

The following hypothesis was tested using multiple regression analysis:

H_0: Technological Support Services has no significant influence on the retention of distance learners at the University of Nairobi.

H_1: Technological Support Services has a significant influence on the retention of distance learners at the University of Nairobi.

Null hypothesis was tested using the following multiple regression equation in order to determine the beta coefficients of all the indicators:

$Z = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + u$

Where Z = Retention of distance learners

$\quad\quad X_1$ = ICT Competence

$\quad\quad X_2$ = Access to online resources

$\quad\quad X_3$ = Access to library

$\quad\quad X_4$ = Communication by SMS

$\quad\quad X_5$ = Call Centre

u = random error

Table 6: Multiple Regression Analysis Results for Influence of Technological Support Serviceson retention of distance learners at the University of Nairobi

a. Model Summary

Model	R	R Square	Adjusted R^2	S.E of Estimate	Durbin-Watson
1	.484[a]	.234	.218	.43883	1.618

a. Predictors: (Constant), TechnoSS_X_5 Call Centre, TechnoSS_X_4Communication by SMS, TechnoSS_X_1 ICT Competence, TechnoSS_X_3 Access to library, TechnoSS_X_2Access to online resources

b. Dependent Variable: Learner RT

b. ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	14.302	5	2.860	34.854	.000[b]
	Residual	46.796	243	.193		
	Total	61.098	248			

a. Predictors: (Constant), TechnoSS_X_5 Call Centre, TechnoSS_X_4Communication by SMS, TechnoSS_X_1 ICT Competence, TechnoSS_X_3 Access to Access to library, TechnoSS_X_2Access to online resources

b. Dependent Variable: Learner RT

c. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		t - Statistic	Sig.
		Beta	Std. Error	Beta	Std. Error		
1	(Constant)	3.175	.165		19.243	.000	3.175
	TechnoSS_X_1 ICT Competence	.179	.145	.270	4.010	.000	.179
	TechnoSS_X_2Access to online resources	-.038	.043	-.067	-.884	.377	.038
	TechnoSS_$X3$ Access to library	.123	.142	.242	.558	.000	.123
	TechnoSS_ X_4Communication by SMS	.133	.031	.276	4.322	.000	.133
	TechnoSS_ X_5 Call Centre	.033	.035	.069	.958	.339	.033

a. Dependent Variable: Learner RT

Study findings in Table 6 reveal that r = 0.484, implying a positive and moderate correlation between Technological Support Services and retention of distance learners at the University of Nairobi. The R^2 was 0.234 indicating that Technological support services explained 23.4% of the variability in learners' retention. The Durbin-Watson statistic was 1.618 indicating that the variables were not correlated. Significance test at 0.05 indicated that ICT Competence (p=0.000); Access to online resources (p=0.377); Access to library (p=0.000); Communication by SMS (p=0.000) and Call Centre (p=0.339) and apart from Access to online resources and Call Centre all the other three variables are all statistically significant. The β coefficient ofICT Competence is 0.270 that of Access to online resources is -0.067, Access to library is .242,Communication by SMS is 0.276

and Call Centre is .069. The β tells us that one unit change in ICT Competence contributes to 27.0% change in learner retention; one unit change in Access to online resources contributes to 6.7% change in learner retention; one unit change in Access to librarycontributes to 24.2% change in learner retention; one unit change in Communication by SMS contributes to 27.6% in learner retention and one unit change in Call Centre contributes to 6.9% change in learner retention.

The ANOVA results reveal that the regression model was significant at F = 34.854 with p value equal 0.000 which is lower than the cut off p value of 0.05. This implies that the null hypothesis was rejected meaning that Technological Support Services support services has a significant effect on learners retention.The indicators did provide the necessary information to predict Learners Retention from Technological Support Services. From the statistical findings we can now specify the following equation;

$$Z = 3.175 + 0.270\ X_1 - 0.067\ X_2 + 0.242\ X_3 + 0.276\ X_4 + 0.069\ X_5$$

The findings from this regression model are supported by the FGDs and descriptive analysis. The variable that had the greatest impact was Communication by SMS followed by ICT Competence. Given that majority of the learners owned mobile phones, learners were able to receive communication especially on reporting dates for residential sessions, confirmation of admission for new students, CATS and examination dates. This findings are similar to those of Riordan and Traxler (2005) who observed that the uses bulk SMS texting did enhance student support, inclusion and retention at University of Wolverhampton. Similarly ICT competence was found to significantly influence retention since learners who have computer skills are more likely to be more receptacle towards the use of computers to facilitate their studies. Learners also valued accessibility to libraries especially in regional centres. This finding is similar to that by Prajapati (2008) who observed that the provision of quality library services enhances learner engagement. However findings from the results on access to online resources showed that learners rated it negatively since they were unable to access the service. Although the service is available, its accessibility is a problem to students outside Nairobi, Kisumu and Chiromo Campuses. Although most of the learning centres had some computers, those in Mere and Eldoret learning centres were not connected to the internet and hence learners did not have access to online resources. Consequently, it was not possible to demonstrate any statistical significance in the case of online resources and retention of students. The same conclusion can be said on Call Centre where most learners felt that the numbers that they were given to call were not be answered, and some of the learners did not even know that there was a call centre that they could get help if they wanted an issue clarified.

V.   Conclusion And Recommendations

On the basis of the study objective which was meant to assess the influence of Technological Support Services influence on the retention of distance learners at the UON, the Cronbach's Alpha Coefficient for the thirteen items used to describe the indicators of Technological Support Services was 0.817 indicating good internal consistency. The composite mean (M=3.651) and composite standard deviation (SD= 1.1126) showed that the respondents generally agreed that Technological Support Services were important in influencing learner retention.

The five indicators for Technological support services were ICT Competence, Access to online resources, Access to library, Communication by SMS and Call Centre and apart from Access to online resources and Call Centre all the other three variables were all statistically significant. The coefficients did provide the necessary information to predict Learners Retention from Technological support services. Descriptive analysis showed that majority of the respondents generally agreed that Technological Support Services were important in influencing learner retention. Inferential statistics indicated that out of the five indicators for Technological support services, Communication by SMSwas found to have a higher influence, followed by ICT Competence, then Access to library, Access to online resources and finally Call Centre. The findings from this regression model are supported by the FGDs and descriptive analysis. Given that majority of the learners owned mobile phones, learners were able to receive communication especially on reporting dates for residential sessions, confirmation of admission for new students, CATS and examination dates. Similarly ICT competence was found to significantly influence retention since learners who have computer skills are more likely to be more receptacle towards the use of computers to facilitate their studies. Learners also valued accessibility to libraries especially in regional centres. However findings from the results on access to online resources revealed that majority of respondents rated it negatively because they were unable to access the service. Although the service is available, its accessibility is a problem to students outside Nairobi, Kisumu and Chiromo Campuses. Although most of the learning centres had some computers, those in Mere and Eldoret learning centres were not connected to the internet and hence learners did not have access to online resources. The same conclusion can be said on Call Centre where most learners felt that the numbers that they were given to call were not be answered, and some of the learners did not even know that there was a call centre that they could get help if they wanted an issue clarified. Hence this study concludes that Technological support services had a statistically significant influence on the retention of distance learners at the UON.

This study used the mixed mode approach, relying more descriptive cross sectional survey, carried out using the questionnaire; correlational research design and qualitative analysis of data collected through FGDs. An in-depth analysis of the independent and moderating variables was carried out using descriptive analysis through the computation of means and standard deviations. Composite means and composite standard deviations were also computed which helped to enrich the analysis. Correlation analysis was carried out to establish the strength of the relationships between the variables. Test of hypothesis was carried out using both multiple regression analysis and stepwise regression to check for the significance of the moderating influence of both learner characteristics and hidden costs. Qualitative data analysis was undertaken through FGDs based on the study variables. This complementarity between quantitative and qualitative approaches strengthened the explanatory power of the study findings by allowing researchers to compare results obtained from both descriptive statistics and inferential statistics in order to provide a detailed interpretation. This study therefore highly recommends the same approach be adapted in any future research on the same area.

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