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Abstract

Purpose: To investigate the effects of information system user skills and IS infrastructure on performance of universities in Nairobi County, Kenya.

Methodology: The study assumed a descriptive research design because it facilitated the gathering of quantifiable information that was used for statistical inference on the target group.

Results: Information system user skill among staff members had significant influence on the performance of universities with frequent use of IS strongly relating; this was followed by proficiency in Microsoft office applications and ease of IS use among staff members. The results also showed that there was significance relationship between Information system infrastructure and the performance of universities.

Unique contribution to theory, practice and policy: User skills remain a critical component towards adoption of IS, it is therefore recommended that IS continuous user training is entrenched within the user framework so as to increase IS up-take and enhance efficiency in its execution. This can be realized through collaborative engagements between the human resource and ICT teams in the respective universities in rolling out capacity building programs which are tailor made to meet and address specific ICT user needs. The state of IS infrastructure is pivotal in ensuring that IS services and products are relayed and availed to the user with requisite reliability and availability. It is therefore incumbent upon universities to ensure that there is a continuous improvement program on the IS infrastructure. Specific is the need to facilitate and realize computer access to all staff members; this coupled with a reliable connectivity increases user confidence levels in their interactions and use of IS solutions.

Keywords: *information systems, performance, user skills, infrastructure*

1.0INTRODUCTION

1.1 Background of the Study

There is a growing consensus among public administration across the world about the need to revitalize public administration to facilitate customer centered, cost-efficient, and user-friendly delivery of services to citizens and businesses (Gnan, Hinna, Monteduro, & Scarozza, 2013; Gupta, Dasgupta, & Gupta, 2008; Urciuoli, Hintsa & Ahokas, 2013). Generally, the e-government success means the successful ICT implementation in government units in order to rebuild government processes and provide e-government services for all government stakeholders translating to effective and efficient usage of e-government by all government stakeholders (Papaj & Hacura, 2015). As a result of this, governments are introducing innovations in management, processes, government services, organizational structure, practices, and capacities (Arundel & Huber, 2013; Dolfsma & Seo, 2013; Reddick, 2011; van der Voet, 2013). This way they mobilize, deploy, and utilize the human capital as well as information, technological and financial resources for service delivery to citizens and businesses (Dhillon, 2005; Reddick & Turner 2012; Torres, Pina, & Acerete, 2005; Tung & Rieck, 2005; Weerakkody, El-Haddadeh, Sabol, Ghoneim, & Dzupka, 2012). Consequently, efficient and effective public administration is an essential precondition for economic and social development (Adam, Delis & Kammas, 2011).

IS in the public sector is a tool to support delivering new and better government services to government stakeholders by increasing efficiency and transparency and by improving accountability in public administration procedures and management (Bekkers & Zouridis, 1999; Dunleavy *et al.*, 2006; Gupta *et al.*, 2008; Heeks, 2002). In particular that refers to benefits which translate into the quality of government services delivered to citizens and businesses; this is due to the fact that public administration is evaluated in terms of competitiveness and attractiveness for the clients of its services (Bhuiyan, 2011; Hwang & Akdede, 2011; Pillania, 2011). Shoham and Perry (2009) allude to the fact that the role of technology in organizations is complex and significant both as a creator of change and as a tool for dealing with change, sometimes operating in tandem. According to Ziemba and Obłąk (2014), the classification of IS implemented in public administration may present as follows Workflow Management Systems (WfMS), Enterprise Information Systems (EIS), Enterprise Application Integration (EAI), Business Process Management Systems (BPMS), Business Intelligence, Human resource Management systems (HRMS), Transactional Management Systems (TMS) and Management Information System (MIS).

Service oriented architecture (SOA) separates functions into distinct units or services which developers make accessible over a network in order that users can combine and reuse them in the production of business applications (Bell M, 2008). SOA is often considered a means for organizations to boost return on investment through reduced costs thus elimination of redundancy and improved productivity among others (Benazeer, Verelst, grembergen & Mannaert, 2008). SOA solutions are used to allow software applications to communicate with each other allowing public administration to integrate the flow of data from the currently implemented IS systems to aggregate data systems, such as Business Intelligence hence providing access to full information in one place (Zorrilla & García-Saiz, 2013). This facilitates ease of information access.

1.2 Statement of the problem

The implementation of ICT in the public sector can be conceived as a tool to build public trust, to enhance confidence, and to promote a more participatory citizen–government relationship, as well as a means for equitable ICT policies (Cordella & Bonina, 2012). Research has indicated that quite a number of parastatals lack appropriation of information technologies and that despite the tremendous effort to embed IT in organizational processes, use of ICT in parastatals is not effective (Lytras *et al* 2008). This is corroborated by the fact that a substantial number of Government Parastatals in Kenya, once initiated, are unable to achieve their objectives without any support of ICT capabilities (Daniels & Associates, 2006). It is imperative to note that assimilation of highly integrated systems across many departments in an organization requires incremental steps and a high level of participation (Weerakkody *et al*., 2011). In relation to this, there is sustained pressure on human resource professionals to be equally the managers of change, including change emanating from the introduction of new IS (Fearon *et al*., 2013; Kajouri, Fallah, Khodayari, & Mohammady, 2013). In addition, Charles Borura (2010) asserts that there is need for parastatals to implement information systems effectively in order to be able to harness the capabilities of the particular IS in line with the strategy of the organization.

The converse to the above highlighted benefits of implementing IS solutions in organizations, in this case universities, is the failure to realize the accrued benefits which subsequently skews the performance of such institutions. Failure to fully embrace IS, means continued use of the legacy manual and semi – automated modes of data transmission and delivery which affects the preservation, processing and retrieval of information either on operational basis or institution's repository. The failure to effectively adopt IS results in wasteful application of resources because of the immense operational costs required to run legacy systems. Such a scenario directly impacts on efficiency and effectiveness in service delivery. The study sought to interrogate the extent to which IS has been implemented in universities within Nairobi county and subsequently find out how such affects their respective performances.

1.3 Objectives

i. To investigate how IS user skill among staff members affects the performance of universities in Nairobi County, Kenya.

ii. To evaluate how IS infrastructure affects the performance of universities in Nairobi County, Kenya

2.0 Literature Review

2.1Theoretical Review

Technology Acceptance Model (TAM) originated by Davis, *et al* (1989) and was further developed and extended in several studies (Davis, *et al*, 2000; Venkatesh & Davis, 2000). It is considered an influential extension of theory of reasoned action (TRA), according to Ajzen and Fishbein (1980) as it sought to explain why a user accepts or rejects information technology. The model suggests that one's actual use of a technology system is influenced directly or indirectly by the user's behavioral intentions, attitude, perceived usefulness of the system and perceived ease of the system. The original model has been extended in several different models: TAM 2 (Venkatesh & Davis, 2000) to explain perceived usefulness and usage intentions including social influence (subjective norm, voluntariness, and image),

cognitive instrumental processes (job relevance, output quality, and result demonstrability) and experience; and TAM 3 (Venkatesh & Bala, 2008); and influenced the development of Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, *et al*., 2003).this theory was deemed relevant for the study as it informed one of the independent variables which is user skills.

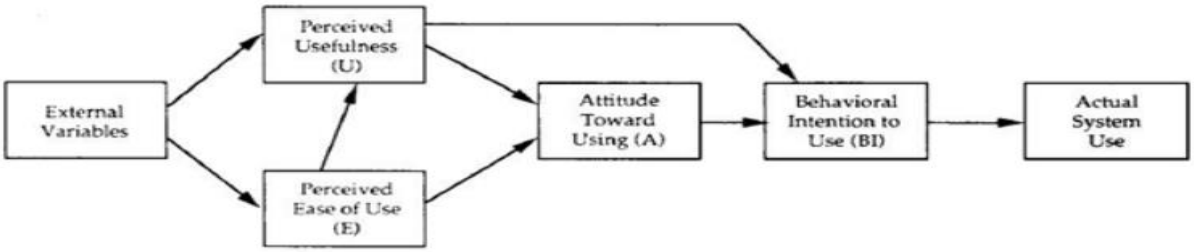

Figure 2.1: Original TAM

Source: Davis *et al (*1989*)*

2.2 Empirical Review

Sife, Lwoga, and Sanga, (2007) while looking at the new technologies for teaching and learning: Challenges for higher learning institutions in developing countries, present the array of ICT implementation challenges and proposals in higher learning institutions in Tanzania. Lack of systemic approach to ICT implementation was cited as one of the challenges where the researchers proposes that ICT infrastructure already in place, ICT skill levels in the institution, number of staff and students in each department and projected growth, academic management process, cost-effectiveness analysis and staff development in new technologies should be factored. Awareness and attitude towards ICTs was another area that the researchers deemed it important that all stakeholders in the institution know the existing ICT facilities and services and their importance in relation to their specific tasks.

Focusing on the Administrative support, the researcher recalls *(*Dwyer *et al*, 1997) emphasize for the integration of ICTs to be effective and sustainable, administrators themselves must be competent in the use of the technology, and they must have a broad understanding of the technical, pedagogical, administrative, financial, and social dimensions of ICTs in education. As regards to Technical support, the researcher pointed out that appropriate strategies should be in place to ensure that integration of ICTs in teaching and learning process goes together with the recruitment, training, retaining and retention of required staff. He adds that as part of transforming higher education, the revolution necessitates restructuring universities and colleges – that is, changing the way higher education institutions are planned, managed and organized.

Staff development was another factor that the researcher whilst agrees with Farrell (1999) who points out that training and workshops are needed not only to improve the skills of the instructors, but also as a means of getting them involved in the process of implementing and integrating ICTs in teaching and learning. Another notable challenge was lack of ownership where the researcher indicated that it was critical that all stakeholders contribute to and own the policy and the plan by agreeing on the projects to be implemented, including their role therein. In conclusion, the researcher highlights inadequate funds and adds that in the quest to address the problem of limited funds and sustaining donor funded projects, he proposes that

higher learning institutions adopt freeware and open source software for teaching and learning activities, continuously press for more funds from their governments; and diversify sources of funds to have a wide financial base.

3.0 RESEARCH METHODOLOGY

The study assumed a descriptive research design because it facilitated the gathering of quantifiable information that was used for statistical inference on the target group. The primary data was collected by administering questionnaires where different strata of the population were included so as to ensure inclusivity and enhance credibility of the outcome. Analysis of this data was done using the SPSS tool version 21 with appropriate descriptive statistical forms used to present the results.

4.0 RESULTS

4.1 Sample Characteristics

4.1.1 Respondent's Education level

The highest level of education attained by the respondents was critical in deducing any relations with the general view and uptake of information systems. Sife, Lwoga and Sanga, (2007), pointed out that appropriate strategies should be in place to ensure that integration of ICTs in teaching and learning process goes together with the recruitment, training and retention of required staff. It is therefore hypothesized that the higher the user's education level, the easier it is to impart additional knowledge on IS use. It was established that the education level was staggered as follows: 5 respondents at secondary level made 1.5%, 13 at Certificate made 3.9%, 18 at Diploma made 5.4%, 94 at degree made 28.3%, 5 had post graduate diploma making 1.5%, 138 had Masters made 41.6% while 46 PhD holders made 13.9% of the total respondents.

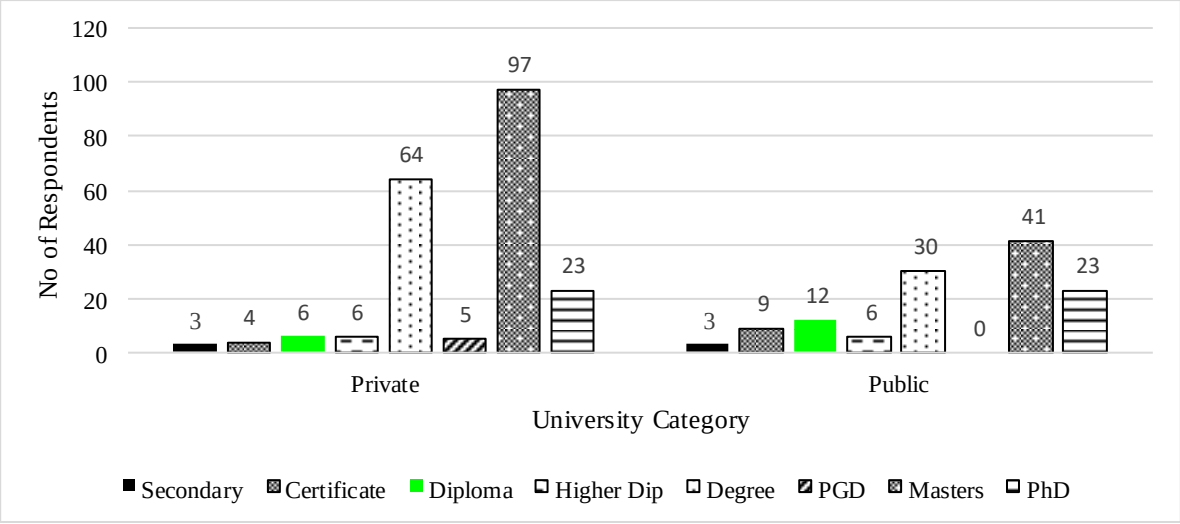

Figure 4.1: Education level distribution

Source: Survey data, (2016)

4.1.2 Duration worked at the university

It was important that this was established of the respondents for it informed if any link existed on how employees embrace IS solutions considering their work duration in the institution. Subject to when the various institutions introduced IS and general automation, experience, as conceptualized in prior research (Kim and Malhotra 2005; Venkatesh et al. 2003), reflected an opportunity to use a target technology and was typically operationalized as the passage of time from the initial use of a technology by an individual. This brings into consideration the length of time a user has been in an environment that championed the use of certain technologies. It was thus realized that 44 had worked Less than 1yr being 13.3%, 155 had worked for 1 to 5yrs making 46.7%, 72 had worked for 6 to 10yrs making 21.7%, 26 had worked for 11 to 15yrs making 7.8% whereas 35 had worked in the respective universities for above 16yrs making 10.5yrs of the total respondents.

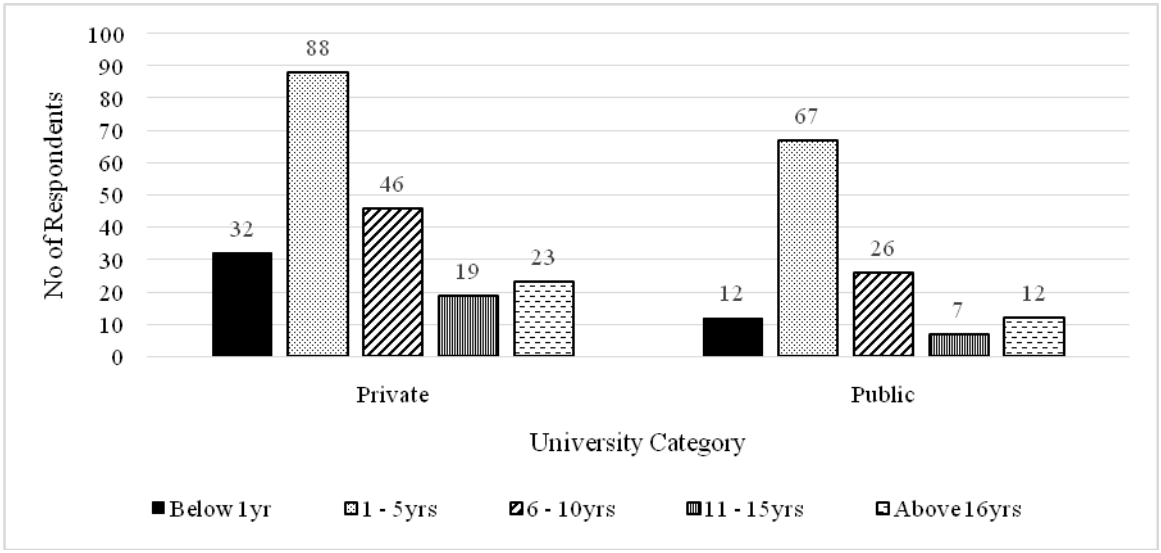

Figure 4.2: Duration worked at the university

Source: Survey data, (2016)

4.1.3 Job division

The respondents were drawn from teaching and non – teaching staff population in the selected universities. This was in application of the stratified sampling technique which was used so as to obtain an all representative sample. The technique allowed the target population to be stratified into the two non-overlapping sub-populations and sample items selected from each stratum that grouped per job group and division (Kothari, 2004). A total of 153 teaching staff making 46.1% and 179 non-teaching staff making 53.9% participated in the study.

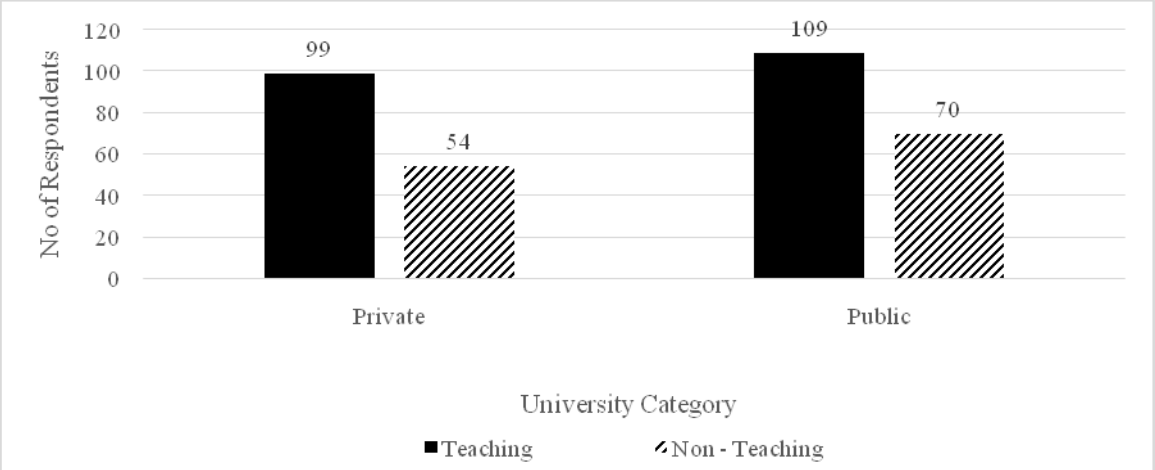

Figure 4.3: Job division

Source: Survey data, (2016)

4.2 User Skills

4.2.1 Proficiency level with Microsoft office applications

It was important that staff members are gauged on their ability to interact with the basic common Microsoft office application, this is because their ability to easily interact with IS is partially informed by their competency levels in the applications. Attaining such levels builds a habit that breeds ease of IS use; Habit has been defined as the extent to which people tend to perform behaviors automatically because of learning (Limayem *et al*, 2007). Kim *et al* (2005) equates habit with automaticity. The UTAUT 2 technology adoption model has since identified habit to inform behavior use and intention (Limayem *et al*, 2007). The study indicated that respondents averagely had 4.47 proficiency level with word, 4.2 proficiency with power point, 3.42 proficiency with access, 4.06 proficiency with excel and 4.52 proficiency with email.

Table 4.1: Proficiency level with Microsoft office applications

University Category		Word proficiency	Power point proficiency	Access proficiency	Excel proficiency	Email proficiency
Private	Mean	4.53	4.30	3.50	4.06	4.59
	N	208	208	208	208	208
Public	Mean	4.37	4.02	3.27	4.07	4.42
	N	124	124	124	124	124
Total	Mean	4.47	4.20	3.42	4.06	4.52
	N	332	332	332	332	332

Source: Survey data, (2016)

4.2.2 Learning to operate IS is easy for the user

The advancement of IS is informed by the ease with which the users are willing to learn and acquaint themselves with its operations. Venkatesh *et al*, (2003) in their UTAUT technology acceptance model, reported that effort expectancy which they defined as the degree of ease associated with consumers' use of technology was a direct determinant of user behavioral intention which in turn informed user behavior. It was ascertained therefore in this study that 0.6% of the respondents did not express opinion, 2.7% strongly disagreed, 4.2% disagreed, 20.8% fairly agreed, 37.3% agreed yet 34.3% strongly agreed.

Table 4.2: Learning to operate IS is easy for the user

	University Category		Total	Percent
	Private	Public		
0	2	0	2	0.6
Strongly disagree	2	7	9	2.7
Disagree	4	10	14	4.2
Fair	38	31	69	20.8
Agree	87	37	124	37.3
Strongly agree	75	39	114	34.3
Total	208	124	332	100

Source: Survey data, (2016)

4.2.3 Frequency of IS Use

The extent staff members were using IS was important in analyzing the uptake of IS. This according to Limayem *et al* (2007) is made possible through hedonic motivation defined as being the pleasure derived from using a technology. This has been found to influence technology acceptance and its use directly as attested by van der Heijden 2004 and Thong *et al*, (2006). Analysis of the responses herein revealed 0.9% of the respondents did not express opinion, 1.5% strongly disagreed, 6.0 disagreed, 18.4% fairly agreed, 29.8% agreed and 43.4% strongly agreed.

Table 4.3: Frequency of IS use

	University Category		Total	Percent
	Private	Public		
0	2	1	3	0.9
Strongly disagree	2	3	5	1.5
Disagree	5	15	20	6.0
Fair	30	31	61	18.4
Agree	70	29	99	29.8
Strongly agree	99	45	144	43.4
Total	**208**	**124**	**332**	**100**

Source: Survey data, (2016)

4.2.4 Users do not use computers to carry out their duties

The query was critical in ascertaining if users had access to computers and the level at which they were using it in executing IS. The original theory of reasoned action by Ajzen and Fishbein (1980) suggests that one's actual use of a technology system is influenced directly or indirectly by the user's behavioral intentions, attitude, perceived usefulness of the system and perceived ease of the system. The constructs mentioned above informing, is was noted that 0.6% of the respondents abstained, 75.9% strongly disagreed, 10.8% disagreed, 4.8% were fairly in agreement, 3.0% were in agreement and 4.8% strongly disagreed. There could however be other factors that informed the use of computers among respondents.

Table 4.4: Users do not use computers to carry out their duties

	University Category		Total	Percent
	Private	Public		
0	2	0	2	.6
Strongly disagree	170	82	252	75.9
Disagree	15	21	36	10.8
Fair	8	8	16	4.8
Agree	3	7	10	3.0
Strongly agree	10	6	16	4.8
Total	**208**	**124**	**332**	**100**

Source: Survey data, (2016)

4.2.5 Users are capable of training their colleagues on IS use

The ability of users to inter - train shows the extent to which they have internalized and mastered the use of IS, this hence necessitated that respondents level is measured. The ability to train is hinged on the experience of the users in terms of their interactions with the IS. In the study therefore, 0.3% abstained, 8.7% strongly disagreed, 6.6% disagreed, 26.5% fairly agreed, 28.9% were in agreement whereas 28.9% strongly disagreed.

Table 4.5: Users are capable of training their colleagues on IS use

	University Category		Total	Percent
	Private	Public		
0	1	0	1	.3
Strongly disagree	17	12	29	8.7
Disagree	10	12	22	6.6
Fair	55	33	88	26.5
Agree	61	35	96	28.9
Strongly agree	64	32	96	28.9
Total	**208**	**124**	**332**	**100**

Source: Survey data, (2016)

4.3 IS infrastructure

4.3.1 Users have access to a functional and efficient computer terminal

Availability of computer terminals is critical and forms a segment of the facilitating conditions which is referred to as consumers' perceptions of the resources and support available to perform a behavior; such facilitating conditions determine the use of technology (Brown & Venkatesh, 2005; Venkatesh*et al*. 2003). This study had 0.9% not expressing their opinion, 5.1% strongly disagreed, 5.4% disagreed, 16.3% fairly agreed, 31.3% agreed and 41.0% strongly agreed.

Table 4.6: Users have access to a functional and efficient computer terminal

	University Category		Total	Percent
	Private	Public		
0	2	1	3	.9
Strongly disagree	4	13	17	5.1
Disagree	6	12	18	5.4
Fair	22	32	54	16.3
Agree	68	36	104	31.3
Strongly agree	106	30	136	41.0
Total	**208**	**124**	**332**	**100**

Source: Survey data, (2016)

4.3.2 Users have access to a reliable network connection

The respondent's opinion on the network status was sought with the results captured herein. 0.6% did not express their opinion, 3.0% strongly agreed, 4.5% disagreed, 11.7% were fairly in agreement, 34.3% agreed and 45.8% strongly agreed. Sife, Lwoga, and Sanga (2007) while looking at the new technologies for teaching and learning in Tanzania, pointed out the critical nature that a robust infrastructure plays in the quest to implementing ICT within learning institutions. The 80.1% of the respondents with access to a reliable connection therefore signifies the efficiency with which IS can be executed hence contributing to the performance.

Table 4.7: Users have access to a reliable network connection

	University Category		Total	Percent
	Private	Public		
0	2	0	2	.6
Strongly disagree	0	10	10	3.0
Disagree	3	12	15	4.5
Fair	9	30	39	11.7
Agree	74	40	114	34.3
Strongly agree	120	32	152	45.8
Total	**208**	**124**	**332**	**100**

Source: Survey data, (2016)

4.3.3 Regular improvement is carried out on the IS

Regular improvement, aimed at enhancing performance and effort expectancy according to Venkatesh*et al* (2003), informs the degree to which users embrace technology. The two are defined as the degree to which using a technology will provide benefits to consumers in performing certain activities; effort expectancy as the degree of ease associated with consumers' use of technology respectively. So as to attain high levels of performance and effort expectancy, it was critical that the state of IS improvement is ascertained. The study indicated therefore 0.9% of the respondents did not express their opinion, 4.2% strongly disagreed, 7.2% disagreed, 27.4% fairly agreed, 37.3% agreed and 22.9% strongly agreed.

Table 4.8: Regular improvement is carried out on the IS

	University Category		Total	Percent
	Private	Public		
0	3	0	3	.9
Strongly disagree	1	13	14	4.2
Disagree	3	21	24	7.2
Fair	54	37	91	27.4
Agree	89	35	124	37.3
Strongly agree	58	18	76	22.9
Total	**208**	**124**	**332**	**100**

Source: Survey data, (2016)

4.3.4 Technical support is offered to IS users

The study showed that 1.7% did not respond, 3.6% strongly disagreed, 7.2% disagreed, 26.2% fairly agreed, 33.4% agreed and 27.7% were strongly agreement. The 39.9% that did not readily agree indicate that enough is not in place to facilitate proper IS implementation.

Table 4.9: Technical support is offered to IS users

	University Category		Total	Percent
	Private	Public		
0	4	2	6	1.8
Strongly disagree	1	11	12	3.6
Disagree	7	17	24	7.2
Fair	42	45	87	26.2
Agree	81	30	111	33.4
Strongly agree	73	19	92	27.7
Total	**208**	**124**	**332**	**100**

Source: Survey data, (2016)

4.3.5The system is normally available for use when I need it

Availability of the IS is paramount in influencing adoption of IS. The user opinion was hence sort in this segment. Limayem *et al*, (2007) asserts that price value is one of the factors that influence behavioral intention towards the use of IS. The value therefore lies in the reliability, efficiency and availability of the IS from a user perspective, this attaches worth into the IS investment. In this study, 1.8% did not respond, 5.1% strongly disagreed, 8.7% disagreed, 18.1% fairly agreed, 35.8% were in agreement and the remaining 30.4% were strongly in agreement.

Table 4.10: The system is normally available for use when I need it

	University Category		Total	Percent
	Private	Public		
0	4	2	6	1.8
Strongly disagree	6	11	17	5.1
Disagree	7	22	29	8.7
Fair	36	24	60	18.1
Agree	76	43	119	35.8
Strongly agree	79	22	101	30.4
Total	**208**	**124**	**332**	**100**

Source: Survey data, (2016)

4.4 Correlation between User Skill and university performance

Frequent use of IS was strongly related to the performance of the university at 0.218 as well as proficiency in Microsoft office applications which was at 0.222. These was followed in strength with the ease of IS use among staff members at 0.251. Extremely negative relations at -0.216 was between frequent use of IS and failure to use computers. This calls for improvement as reflected in Sife, Lwoga, and Sanga (2007) study when they agreed with Farrell (1999) who indicated that staff development which points to training and workshops were needed not only to improve the skills of the instructors, but also as a means of getting them involved in the process of implementing and integrating ICTs in teaching and learning.

Table 4.11: Correlation between User Skill and university performance

		University Performance	MS office	Ease of IS use	Frequent IS use	Computer use	Capable of IS training
Pearson Correlation	University Performance	1.000	.222	.251	.218	-.213	.255
	Microsoft office applications	.222	1.000	.456	.487	-.164	.401
	Learning use of IS is easy for me	.251	.456	1.000	.673	-.131	.623
	I use IS frequently	.218	.487	.673	1.000	-.216	.626
	I do not use computers to carry out mu duties	-.213	-.164	-.131	-.216	1.000	-.116
	I am capable of training my colleagues on IS use	.255	.401	.623	.626	-.116	1.000

Source: Survey data, (2016)

4.5 Regression Analysis

User skills among staff members contribute to performance by 0.184.

Table 4.12: Regression Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.808	.119		15.130	.000
	IS user skills among university staff members	.184	.038	.248	4.817	**.000**

a. Dependent Variable: University Performance

Source: Survey data, (2016)

4.6 Correlation between IS infrastructure and university performance

There was a strong correlation between having access to a functional and efficient computer terminal and the university performance at 0.154. Regular IS improvement and IS availability were also notably strongly correlated with the university performance at 0.284 and 0.288 respectively. There was no negative correlation however, among the least relation was whether good and reliable technical support was offered against regular IS improvement at 0.736. Others with low correlation were access to a reliable network connection and regular IS improvement at 0.635. It is evident that IS infrastructure requires additional investment across the board by allocating requisite funds to facilitate the sprucing up of weak segments. This is in contrast with the state in Saudi Arabia as Almadhour (2010) concluded in his study that unfortunately although the Saudi Arabian government had lots of funding, there was no clear strategic framework towards equipping ICT in schools. In Kenyan universities however,

this study showed the need for both additional funding as well as strategy support in IS implementation.

Table 4.13: Correlation between IS infrastructure and university performance

		University Performance	computer access	reliable network	IS improvement	technical support	IS availability
Pearson Correlation	University Performance	1.000	.154	.327	.284	.333	.288
	I have access to a functional and efficient computer terminal	.154	1.000	.632	.472	.417	.408
	I have access to a reliable network connection	.327	.632	1.000	.635	.568	.573
	The IS undergoes regular improvement	.284	.472	.635	1.000	.736	.621
	Good and reliable IS technical support is offered	.333	.417	.568	.736	1.000	.616
	The IS is normally available for use when I need it	.288	.408	.573	.621	.616	1.000

Source: Survey data, (2016)

4.7 Regression Analysis

Information system infrastructure contributes to performance by 0.179.

Table 4.14: Regression model

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.808	.119		15.130	.000
	IS Infrastructure	.179	.042	.248	4.290	**.000**

a. Dependent Variable: University Performance

Source: Survey data, (2016)

5.0 Conclusions

As regards to user skills, it was established that almost all staff members in universities within Nairobi County used computers and had working knowledge of Microsoft office applications. However, a third found it hard to operate IS solutions with half not having comprehended its operations to a point of being able to transfer that knowledge through training, these was mostly noted within teaching staff in public universities.

In relation to IS infrastructure, Private universities had invested in a reliable network connection besides training staff on IS and implementing a stable system that ensured availability and reliability. Technical support was nevertheless below per and hence a challenge in implementing a stable IS which cut across the board.

6.0 Recommendations

User skills remains a critical component towards adoption of IS, it is therefore recommended that IS continuous user training is entrenched within the user framework so as to increase IS up take and enhance efficiency in its execution. This can be realized through collaborative engagements between the human resource and ICT teams in the respective universities in rolling out capacity building programs which are tailor made to meet and address specific ICT user needs.

The state of IS infrastructure is pivotal in ensuring that IS services and products are relayed and availed to the user with requisite reliability and availability. It is therefore incumbent upon universities to ensure that there is a continuous improvement program on the IS infrastructure. Specific is the need to facilitate and realize computer access to all staff members; this coupled with a reliable connectivity increases user confidence levels in their interactions and use of IS solutions.

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