ASSESSING KNOWLEDGE LEAKAGE ON PERFORMANCE AMONGST TEACHING STAFF IN PUBLIC UNIVERSITIES IN KENYA

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ABSTRACT

Although universities in Kenya recognize that knowledge retention amongst teaching staff enhance universities' performance, there are gaps that hinder collaboration, linkages, knowledge sharing and management, and improved Information Communication Technology physical infrastructure. Today, poorly established platforms where knowledge can be shared amongst the teaching staff are common in most of the universities. Technologies that speedily transfer knowledge are poorly retained and maintained, reliable knowledge management systems that are integrated in the available IT infrastructure are missing and knowledge sharing and management policies have not been understood. The objective of the study was to determine the ways in which knowledge leakage has impacted on innovations amongst teaching staff in public universities in Kenya and; Propose suitable knowledge sharing and management strategies that can be used to enhance performance of knowledge workers in public universities in Kenyan. The study adopted descriptive research. The study population consisted of twenty three (23) chartered public universities. The study used systematic random sampling to select six universities from 23 chartered universities. The sample size was three hundred and eight (308) respondents. Data was collected through structured questionnaires. Data was analyzed using quantitative method. Data was analysed using descriptive statistics aided by Statistical Package for Social Sciences (SPSS) and presented in percentages, frequencies, means, tables and graphs. The study established that knowledge leakage lead to the loss of specialized expertise with a high significant association between knowledge leakage and impact on innovations ($\chi2(6) = 21.631$, $p=.001$) which was less than 0. The study recommends that public universities provide for consistent skill training to mitigate knowledge leakage and provide incentives to ensure knowledge retention

Keywords: Knowledge, knowledge leakage, knowledge retention, innovation, performance, teaching staff

INTRODUCTION

According to Durst et al., (2015), knowledge leakage is the loss of knowledge intended to stay within an organization but is degraded over time. This loss can affect the organization either positively or negatively. Positive loss is where knowledge spills over to other organizations through collaborations while negative leakage is when knowledgeable members leave an organization or external partners misappropriate knowledge from the organization in question or when an organization becomes redundant. To minimize knowledge leakage, Anderson (2012) advocates knowledge sharing through consistence skills training, which also improves organizational performance. These findings are supported by Mohamed et al., (2007) who encouraged organizations to train everyone including new hires and transferees practically while retaining both in-house knowledge and experience with realistic examples. This will be a way of maintaining skills learnt especially tacit knowledge which does not leave the mind. Due to financial constraints within universities, the outsourcing of teaching expertise has become a common practice. This inadvertently leaks out knowledge about the outsourcing organization and is happening at a time when most organizations are

shifting to globalization in an attempt to appreciate knowledge economy. It therefore calls for an understanding of the nature of knowledge within a given organization and how this knowledge can boost its performance and competitiveness (Tsui, 2006). According to Dalkir (2005), although studies affirm that organizations reap knowledge from others through dynamic interactions, there is need for organizations to harness knowledge capabilities of their workers to minimize knowledge leakage.

The paper argues that an established organizational repository requires that all academic staff deposit all their research outputs such as datasets, theses, lecture notes, learning objects, conference proceeding and any other valuable grey literature generated within the university to provide access to the university community members. The staff within these repositories digitizes, organizes and categorizes the knowledge for easy access. This provides a common platform where scholars within the university can contribute scholarly knowledge for inter-disciplinary research. Eventually, this electronic explicit knowledge gains global visibility while allowing measurable research output by the university. To this end,

Kagwiria (2016) found that many universities in Kenya are yet to develop working institutional repositories through which the academic staff can channel their research output.

Koulikov (2011) notes that generating knowledge is a costly venture and for one to willingly transfer it to another party may require incentives that can motivate the knowledge owner to share. The author explains that Knowledge organizations may create some awards for knowledge owners who transfer their knowledge to others and that money can also be directly given to individuals as a motivation factor to prompt knowledge owners to share knowledge. Gagne (2009) in "A Model of Knowledge sharing" motivation has a different perception. Gagne argues that tangible rewards like money to researchers are insufficient and can be detrimental to the motivation to share knowledge. Instead the author advocates for appropriate reward systems and sharing opportunities within organizations.

Statement of the Problem

Universities lose a lot of their treasure they have generated over a long period through knowledge leakage without notice. It is evident that in various universities teaching staff change or leave employment for one reason or another. It may be as a result of retirement of very experienced knowledgeable staff in a specialized field or resignation to change to a better employer. When they quit, they do not prepare handover notes about specific knowledge they own to the new comers. Again, there is no evidence of universities hiring mentors to assimilate new comers into the gaps left by those who exit. In addition, there is an assumption that knowledge is useful in a particular situation and there is no need to retain and maintain old knowledge. Because such knowledge is only retained in the mind of the creator, it is easily leaked out when the employee exits. With regard to this there exists a gap within the Kenyan universities where dynamic knowledge that is rich for innovations is lost. Because the dynamic knowledge is not retained and maintained through sharing, a particular university cannot remain a champion of a specific innovation

Objective of the study

- Determine the ways in which knowledge leakage has impacted on innovations amongst teaching staff in public universities in Kenya
- Propose suitable knowledge sharing and management strategies that can be used to enhance performance of knowledge workers in Kenyan public universities.

To achieve the objective, the study generated a conceptual framework shown in Figure 1
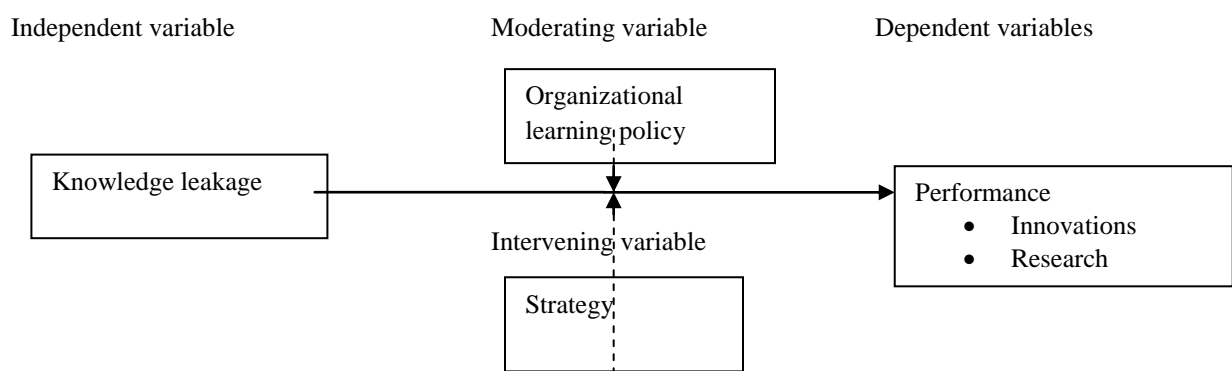

Figure 1: A conceptual framework for knowledge leakage

The framework postulates that knowledge leakage and poor knowledge management deny universities dynamic knowledge that could otherwise be translated into innovation and research outputs. However such a loss can be mitigated if there are guidelines and programs to be adhered to during knowledge management activities

METHODOLOGY

The study used descriptive research design to solicit data and information on assessing knowledge leakage on performance amongst teaching staff in public universities in Kenya. Specifically, the study systematically sampled six public universities namely Chuka, Egerton, Masinde Muliro University of Science and Technology, Laikipia, University of Kabianga and Kibabii from all 23 chartered public universities. Systematic sampling involved a random sampling

where the researcher chose every fourth university from a list of Kenya Public universities (http://www.advance-africa.com/Universities-in-Kenya.html). This sampling technique was adopted because it is bias free (Kothari and Garg, 2014). The unit of analysis was the teaching staff of these universities. This sampling technique was adopted because it is bias free (Kothari and Garg, 2014). The unit of analysis was the teaching staff of these universities. The study determined its sample size (308) using the Saunders, Lewis and Thornhill (2012)

formula. The sample size was determined from the target population of 1852 through interpolation. The study used disproportionate stratified sampling to establish the sample size for each category: namely university librarians, academic deans, academic heads of departments and teaching staff shown in Table 1 (Kothari and Garg, 2014). This avoided over-representation and allowed separate analysis of each stratum.

Table 1: Summary of sample size

Respondents	MMUST	Laikipia	Chuka	Egerton	UoK	Kibabii	Sample
University librarians	1	1	1	1	1	1	6
Academic Deans	9	4	4	9	7	5	38
Academic Heads of Departments	15	11	9	32	16	26	109
Teaching staff	35	15	18	51	21	15	155
Total number of respondents	60	31	32	93	45	47	308

Simple random technique was then used to select the respondents for teaching staff category (stratum) while librarians', academic heads of departments and academic deans strata sampled all cases. Data was collected through closed ended questionnaires. Descriptive and inferential statistics were used for data analysis with statistical computations that included percentages, frequencies and means and presented in tables and graphs. Thereafter inferential analysis was done to test dependence of the performance of teaching staff in Kenyan public universities on knowledge leakage using chi-square test. The study established the

relationship between the independent variable and the dependent variable using associations.

RESULTS AND DISCUSSION
Demographic Data

The study obtained demographic information based on; period worked in the positions they were in, highest academic qualification, age bracket, and length of time worked in the university. The data collected was analysed and the results obtained from analysis captured in this section. The results obtained on respondents' gender were captured in Figure 2
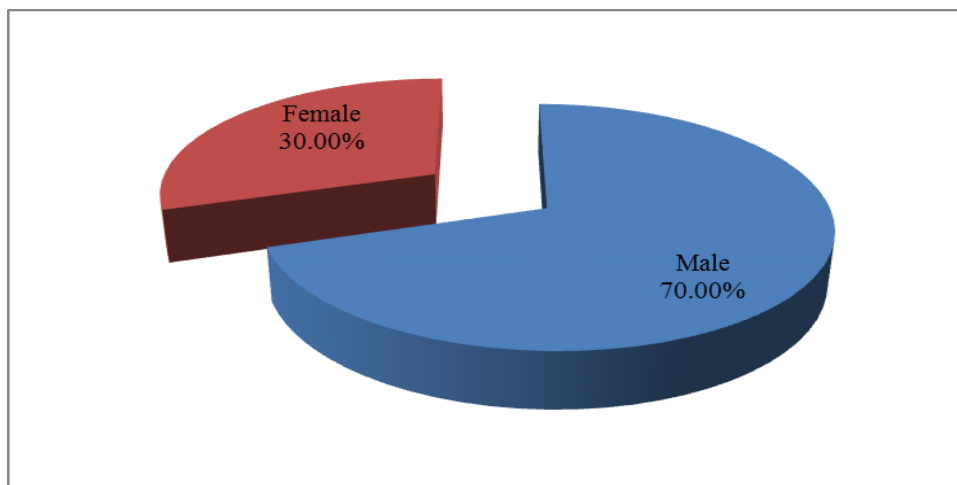

Figure 2: Gender of the respondents
Source: Research data (2017)

The results in figure 2 show that 30% of the total number of respondents were female while 70% were male, a pattern exhibited across all the 6 universities surveyed. It was observed that male officers exceeded two thirds of the total number of respondents as the females were less than a third of the total number of respondents, creating gender imbalance against 2/3

gender rule enshrined in the constitution of Kenya 2010 (Republic of Kenya [RoK], 2010).

Levels of Education of the Surveyed Population
The academic qualifications of the respondents from the analysis were captured in Table 2.

Table 2. Frequencies and percentages of highest academic qualification of university teaching staff in Kenya

Staff category		Highest level of education			
		Bachelors	Masters	PhD	Total
Librarians	No.	2	3	1	6
	%	33.33	50.00	16.67	
Teaching Staff	No.	15	109	31	155
	%	9.68	70.32	20.00	
Deans of Schools	No.	0	12	28	38
	%	0.00	30.00	70.00	
Heads of Departments	No.	0	48	61	109
	%	0.00	44.04	55.96	
Total		17	171	120	308

Source: Research data (2017)

A majority of the librarians (50%) had Master's degrees, and only 33% had Bachelors Education while 16.67% had PhD. This is a clear indication that librarians have a reason or the motivation to seek higher education. Majority of the teaching staff, 70% had Master's degrees, 20% indicated that they had undergraduate degrees and 10% were PhD holders.

All the teaching staff, who had showed that they possessed bachelor's degrees, indicated that they had enrolled for master's programmes as a condition by their respective schools/faculties. They were serving either in the positions of graduate assistants or part-time lecturers. A number (53) of the teaching staff showed that they were pursuing PhD programmes. Despite CUE upholding the November 2018 deadline for all lecturers to be PhD holders, there is an alarm over the low PhD enrolment rate in Kenya (Ayiro & Sang, 2011). With 20% teaching staff having PhDs it may be hard to meet the deadline by November 2018.

While 44 % Heads of departments said they possessed Master's degrees, 56% had PhDs and none had undergraduate degrees as their highest academic qualification. This shows that many universities are raising the knowledge bar in appointing heads of various departments who can assess aspects of knowledge management, knowledge leakage, information sharing, and the knowledge communities.

Age Bracket and Years of Experience
The age bracket, specified by the study, to choose from were; less than 25 years, 26 to35 years, 36 to 45 years, 46 to 55 years and above 56 years.

From Table 3, it is only amongst the teaching staff that there were respondents aged below 25 years, totaling 16(10.32%). There was no respondent aged below 25 years amongst the heads of department as well as the deans or even the librarians. The majority of those surveyed aged below 25 years were serving as Graduate assistants and part-time lecturers. Two (2) out of the 6 librarians surveyed were aged 36 - 45 years while 4 of them were aged 46-55 years.

Of the heads of departments and school deans, 40% and 50%, respectively were aged between 36 and 45 years. On the other hand, 67% librarians, 49.6% heads of departments, 50% deans and 40% teaching staff members were aged 46-55 years. On the other hand, 10.09% heads of departments and 9.68% members of the teaching staff were aged above 56 years. The overall analysis by age bracket is captured in Table 4. Overall, those aged less than 25 years were the least (5.19%) followed those above 56 years at 8.4%.The highest population of teaching staff (45.1%) was in the age bracket of 46-55 years. This implies that 46-55 year age bracket was the modal age of the respondents. The respondents provided information of the period worked in the present positions and results of analysis captured in Table 5.

Table 3: Frequency and percentage of teaching staff by age according to positions in Kenyan universities

Age Bracket	Librarians	Teaching Staff	Deans of Schools	Heads of Departments	Overall
< 25 years	0	16	0	0	16
% in Group	0.00	10.32	0.00	0.00	5.19
26 -35 years	0	31	0	0	31
% in Group	0.00	20.00	0.00	0.00	10.06
36 - 45 years	2	31	19	44	96
% in Group	33.33	20.00	50.00	40.37	31.17
46 - 55 years	4	62	19	54	139
% in Group	66.67	40.00	50.00	49.54	45.13
> 55 years	0	15	0	11	26
% in Group	0.00	9.68	0.00	10.09	8.44
Total	6	155	38	109	308

Source: Research data (2017)

Table 4: Frequency and percentage of teaching staff in different age brackets in Kenyan universities

Age Bracket	Frequency	Percent
less than 25 years	16	5.19
26 to35 years	31	10.07
36 to 45 years	96	31.17
46 to 55 years	139	45.13
above 55 years	26	8.4
Total	308	100.00

Source: Research data (2017)

Table 5: Percentages of period of experience of university academic staff in Kenya

Staff category	Period of experience (years)			
	1-5	6-10	11-15	>15
Librarians	83.33	16.67	0.00	00.00
Teaching Staff	54.84	45.16	00.00	0.00
Deans of Schools	00.00	00.00	00.00	00.00
Heads of Departments	90.83	09.17	00.00	00.00
Overall	73.70	26.29	00.00	0.00

Source: Research data (2017)

From Table 5, it is clear that the modal number of years of experience across the surveyed population is 1-5 years. In numbers this represents 227 out of 308 (73.70%) of the total population surveyed. This means no dean had more than 5-year-experience, pointing to the modal period tied to deanship in the knowledge industry. The fact that the librarians had between 1 and 5-year-experience showed that they did not stay in their work stations for long.

All deans had years of experience in brackets 6-10 years and beyond. Comparing their years of experience to their ages, with 50% of them aged 46-55 years, and 50% of them aged 36-45 years, with none aged over 56 years, shows that rise to management levels credits some consistency in career development. In any management, the policy drafters are as important as the policies drafted (Frost, 2014). In this study, there are elements on policy, procedures, and performance, and the people driving this are obviously defined by their level of understanding of the entire system, basically function of their experience, exposure and education.

Knowledge Leakage across the Academic Deans
The respondents' perception of the effect of a staff member switching positions within the same university or moving to other institutions on the deprivation of valuable operational knowledge and the results of analysis are captured in Figure 3.
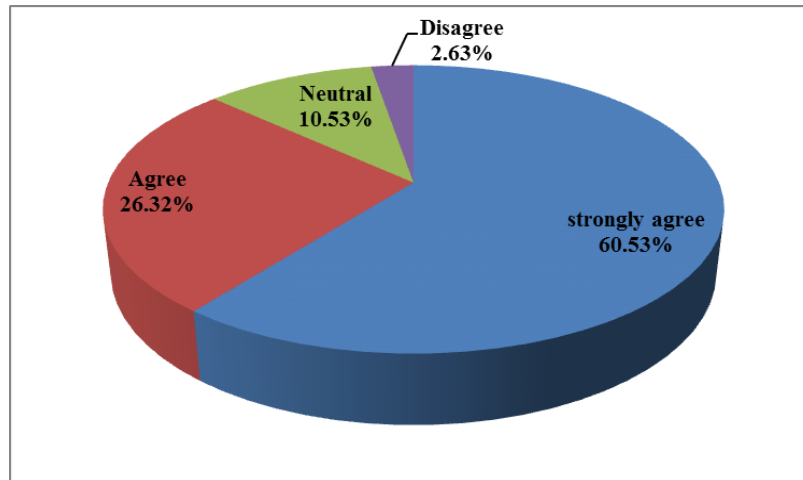
Figure 3: Knowledge leakage perception by departing staff member
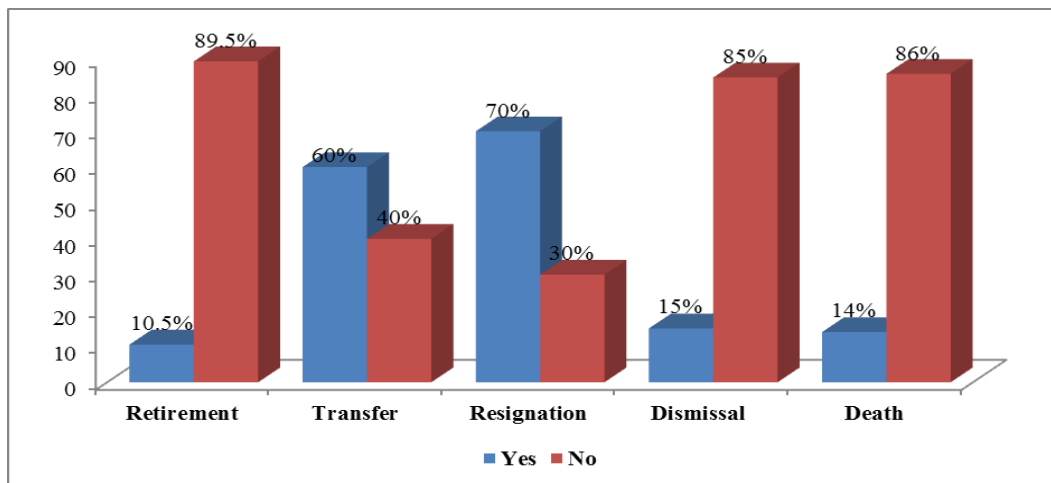*Source: Research Data (2017)*

Figure 4: Challenges leading to knowledge leakage via staff members
Source: Research Data (2017)

As to whether leaving members of staff from their school deprived them of valuable operational knowledge, 60.53 % of all the deans strongly agreed to it as 26.32 % agreed, 10.53% indicated they were neutral, and the remaining 2.63% disagreed to the assertion. The study confirmed Edoun (2016) findings that departure of staff members deprived the university valuable operational knowledge. The causes of members switching positions within the university or moving to other institutions are shown in Figure 4.

From figure 4, 70.00% of the respondents indicated that resignation was a cause of sudden departure of lecturers leading to knowledge leakage as 30.00% indicated that it was not. As 60% indicated that transfer was a cause of sudden departure of lecturers leading to knowledge leakage, 40.00% showed that it was not. However, 89.50% indicated that retirement was not a

cause of 86.00% of sudden departure of lecturers leading to knowledge leakage. As 86.00% showed that death was not a cause of sudden departure of lecturers leading to knowledge leakage, 85.00% also showed that dismissal was not. According to these results, resignation was the most highly ranked cause of resignation followed by transfer.

The above means that generally lecturers in Kenyan Public universities have issues with existing administrations and are more likely to take a transfer to another work station-which still can be a component of resignation, than they are likely to work until retirement. Death is a natural phenomenon and unless there are epidemic cases, it is naturally expected that it occurs late in one's life. In most work stations, cases of dismissal border on disciplinary issues between the dismissed and the organization. Other factors leading

to disharmony can set up conditions leading to dismissal. Since it is a process that must have created disharmony, it scores low at 15% as a cause for exit.

Other effects of teaching staff departure on the institution's work activities were incomplete work leading to heavy workload amongst the remaining labor pool as indicated by 80%. Others quipped that the challenge also lead to loss in certain specialized expertise within the teaching, administrative and research ranks of the universities. The fact that some attempts to replace the departed members of staff can lead to bringing in incompetent replacements, exacerbates the case. Such potential challenges as mentioned above better be mitigated proactively, actively and reactively. However, 80% of the respondents did not clearly state what measures their universities were taking to mitigate such expected setbacks. About 20% hinted on the following:

(i) retirement and succession planning to take care of what may arise upon retirement of a dependable member of teaching staff;

(ii) Conducting exit interviews for members of teaching staff leaving to be able to loop the necessary mitigation for those still serving and if possible, try to do it for those who are leaving to see if an immediate reversal is feasible.

(iii) Conduct prior counseling sessions, issue warnings prior to dismissal in order to give affected teaching staff an opportunity to rectify;

(iv) In the event they do not rectify as in stated (iii) above, conduct exit interviews for them to understand the reason for dismissal. Such will instill confidence in the remaining teaching staff because it will portray the institution's administration professional, supportive, and concerns about the success.

(v) In case of death, support the family that has lost and seek replacement (of the teaching staff)

None of the teaching staff mentioned about elaborate staffing plans based on sustainable staff: student ratios and where the schools or faculties are constantly seeking to uphold and sustain such standards. This would ensure continuity and assure the efficiency of knowledge delivery, especially if the replacements are equal to the tasks.

On mechanisms put in place to retain a departing member of staff's knowledge, only 15 % mentioned that they are:

i. encouraging documentation of knowledge and skills;

ii. arranging forums for more experienced teaching staff sharing experiences with other staff;

iii. supporting continuous training in relevant skills especially through conferences;

iv. Facilitating and organizing open lectures presided over by experienced teaching staff from various schools or faculties and

v. Establishing elaborate information storage and retrieval mechanisms;

On critical knowledge to be tapped from departing lecturers, respondents enlisted research skills, course content development, lecture preparation, teaching skills, exam setting, and marking skills as crucial. They also felt it imperative for those skills to be immediately passed on any new incoming teaching staff to ensure continuity. On the recommended mechanism of tapping the knowledge, they suggested that documentation of processes, lecture notes, laboratory procedures information sharing forums be put in place. None mentioned creation of opportunities to showcase and promote innovations in various capacities. Only 21.5 % of the respondents agreed that they had had innovations in their respective careers. None strongly agreed, and 20 % was neutral. Shockingly 30% strongly disagreed and a staggering 28.5 % opted not to respond to it.

Knowledge Leakage among Members of the Teaching Staff

While 70% of the teaching staff strongly agreed that leaving members of staff deprived them of valuable operational knowledge, 10% agreed, 15% remained neutral, 5% disagreed and none strongly disagreed. This is in comparison with the dean's survey which revealed that 60.5 % of all the deans (23 out of 38) strongly agreed; 26.3 % (10 out of 38) agreed; 10.5% (4 out of 38) opted neutral; and the remaining one (1 out of 38 or 2.6%) disagreed. None strongly disagreed. Table 4.6 illustrates this cross-cutting comparison between the teaching staff members and the Deans:

Table 6: Percentage of Deans and Teaching Staff response comparison on whether a leaving member of staff deprived organization of valuable operational knowledge

Category	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Deans	60.50	26.30	10.50	2.60	0.00
Teaching Staff	70.00	10.00	15.00	5.00	0.00

Source: Research Data (2017)

From the above table, the total percentage of the deans agreeing (i.e agreeing and strongly disagreeing) is 86.8% of their population surveyed while that of the teaching staff sums up to 80% of their surveyed population. In both cases, it shows that the majority are in agreement that members of staff who leave research organizations are likely to deprive the organization valuable information if the organization exists under similar circumstances as those surveyed. A comparison between those disagreeing and those remaining neutral does not give much difference. This is evidence that the two categories operate under similar circumstances, carry out related teaching jobs,

with the uniqueness that the deans are in middle management positions.

The above is also evidence that knowledge leakage is a potential risk under certain operational conditions which need further investigation. Such crucial operational knowledge can be leaked when members of staff retire, take a transfer to other institutions, decide to resign, are dismissed or even die. It is premised on this that the research was prompted to survey across the 6 universities as pertains to knowledge leakage through such means shown in Table 7.

Table 7: Status of Challenges leading to knowledge leakage through teaching staff members in percentage

Challenges	Yes	No
Retirement	20.00	80.00
Transfer	60.00	40.00
Resignation	70.30	29.70
Dismissal	20.00	80.00
Death	20.00	80.00

Source: Research Data (2017)

From table 7, resignation –rated at 70.3% by the surveyed population, is the leading cause of sudden departure of teaching staff leading to knowledge leakage. Transfer closely ranks at 60%. Retirement as well as death rank lowest at 20 % each. Death is a natural phenomenon and unless there are epidemic cases, it is naturally expected that it occurs late in life. It is not much likely that it becomes a prevailing challenge amongst those leading to knowledge leakage. In most work stations, cases of dismissal border on disciplinary issues between the dismissed and the organization. Dismissal scores low at 20% as a cause for exit of staff.

On the effect of knowledge leakage to the institutions work activities. Incomplete work leading to heavy workload amongst the remaining labor pool dominated, with at least 60% of the respondents indicating so. This was especially so amongst respondents who supported the view that transfer and resignation are challenges in knowledge leakage. Others quipped that the challenge also lead to loss in certain specialized expertise within the teaching, administrative and research ranks of the universities. Such potential challenges need to be mitigated proactively, actively and reactively. Proactive measures taken by an institution can come in handy. However, 60% of the respondents did not clearly state what measures their constituent departments or schools or university as a whole were taking to mitigate such expected setbacks. About 40% hinted on the following:
(i)   General: recruitment and training;

(ii)   HR planning; and appointing part-time teaching staff;

The above list compliments the points already raised by the deans on the same issue. Just like the deans, none of the members mentioned about elaborate staffing plans based on sustainable staff: student ratios and where the schools are constantly seeking to uphold and sustain such standards. This would ensure continuity and assure efficiency of knowledge delivery.

On mechanisms put in place to retain a departing member of staff's knowledge respondents suggested the following:
(i)   mentoring other staff to be able to handle work;
(ii)   keeping records of all the CATs, notes, exam results, and published papers;

The two points, again compliment what the deans had already proposed. On critical knowledge to be tapped from departing lecturers, those who contributed enlisted preparation of e-learning material and exam setting; course outline, content organization and delivery. These, except preparation of e-material had already been mentioned from the deans' survey. The members of the teaching staff surveyed also suggested that new members of staff be inducted on course on preparation and class control; teaching techniques; how to handle students; and modern diagnostic techniques for lecturers in environmental studies. On the recommended mechanism of tapping the knowledge, those who responded suggested that field experience knowledge be documented at every stage. Just like the

deans, no teaching staff member surveyed mentioned creation of opportunities to showcase and promote innovations in various capacities as a way of tapping and retaining knowledge from more experienced scholars and researchers, yet innovation is at the core of knowledge dynamism and creation. Most brilliant scholars find expression in bringing about new ideas and approaches to problem solving. The most important side of our universities should be providing a platform for knowledge sharing and management that would lead to solving real time challenges the society goes through. However, when asked about innovations, only 10 % of the respondents agreed that they had had innovations in their respective careers. 10% strongly agreed, and 10 % remained neutral. 20% disagreed, and another 20% strongly disagreed while 30 % opted not to respond to it. Table 8 summarizes the comparison between ratios posted by the heads of department and those by the teaching staff on challenges of knowledge retention:

Table 8: Percentage of response on problems related to knowledge retention by Heads of Departments and Teaching Staff

Problems	Head of department	Teaching Staff	Overall
Lack of information	80.00	70.00	74.62
Information overload	70.00	80.00	76.14
Reinventing the wheel	40.00	60.00	51.89
Knowledge loss when staff exit	95.00	60.00	74.62
Poor sharing of knowledge	95.00	60.00	74.62

Source: Research Data (2017)

A total of 80% respondents from the teaching fraternity indicated that knowledge retention is suffering the setback of 'information overload'. This is in comparison with the 70% ratio of the respondents from amongst the heads of department. Other comparisons are in Table 8. The differences may be as a result of varied roles in teaching and management. Also, generational gaps bring about differences in opinion.

Additionally, 70% of the teaching staff respondents held that the university's perception is that knowledge creation is each and everyone's job, compared to 90% of the respondents from among the heads of departments who held that knowledge creation is part of their performance contract is the notion of their respective universities. The two were the views held by the majority from the respective surveyed populations. If knowledge creation is everyone's job, then to fill the gap left by, for instance more experienced members of teaching staff should be filled by anybody. Yet in reality that cannot be the case. A long serving teaching staff who has climbed through the ranks to re-known researcher, on his exit, cannot be replaced by a less experienced teaching staff.. Similarly, if it is part of the employee's contract, then the administration has the duty to support the employees deliver on the mandate just as it has the duty to monitor such delivery. This calls for a fresh approach to showcasing the relevance of knowledge management. This opens up an opportunity for fresh ideas on knowledge management to be infused for more support with the universities.

Answer lies in analysis of the cost and benefits accrued. This is the position of realigning priorities.

According to this survey, over 80% respondents believe that effective knowledge management can bring about improved competitive advantage; help improve research and development; enhance innovations; bring about employee development; and better decision making. At least 60% of the surveyed representative populations believe it can bring about improved quality, delivery, and cut down on overall operational costs in an educational, research and development organization, like a university. Despite all this great promise, there are a number of hurdles identified. Over 75% of the respondents rated lack of top management commitment. This position does not conflict with the noting that the respondents equally believe top management can act on this. It only strengthens the argument that beyond the capacity to act, and the willingness to do so, there must be commitment. On the other hand, top management may argue in terms of constrained resources and the simple answer lies in the position of realigning the priorities after analyzing the cost and benefits accrued.

Inferential Analysis
The study established the level of association between the independent variables and related dependent variable (Figure 1) indicators. Chi Square was used to address whether any relationship in the sample population was strong enough for the study to justify making inferences about the larger population from which the sample had been drawn (Newmark, 1975).

The study first obtained contingency table for each association to explain the relationship and then produced chi-square results. The Chi-Square ($\chi2$) is

given by: χ2 = S (Observed Frequency - Expected Frequency)^2 / Expected Frequency (King'oriah, 2004). The importantly considered interpretation of Chi-Square (χ2) output is the significance probability, which should be *less than 0.05* for the association to be translated as being significant (Garth, 2008). The study used t 5% level of significance (95% confidence level).

Before interpreting Chi-Square look at the "Minimum Expected Counts". Chi-Square test requires that the value for the expected count should not fall below 5 in more than 25% of the cells, to justify in carrying on with the interpretation of the Chi-Square statistics.

Chi-Square for Knowledge Leakage and Impact on Innovations
The study obtained the contingency for the impact of Knowledge leakage on innovations amongst teaching staff and the results captured in Table 9.

The results in Table 9 show all those who indicated that there was no knowledge leakage (100%) indicated that knowledge leakage impacted on innovations amongst teaching staff. The results show that all those who showed that they were not sure on whether there was knowledge leakage (100%) indicated that knowledge leakage had an impact on innovations amongst teaching staff.

A majority of those who indicated that there was knowledge leakage (57.10%) indicated that knowledge leakage did not impact on innovations amongst teaching staff. Majority of those who indicated that there was knowledge leakage (73.30%) indicated that knowledge leakage did not impact on innovations amongst teaching staff. Chi-Square tests were carried to establish relationship between knowledge leakage and its impact on innovations amongst teaching staff in public universities. The Chi-Square tests results are shown in Table 10.

Table 9: Knowledge Leakage and Impact on Innovations Cross Tabulation

			Impacted on innovations			Total
			Strongly disagree	Neutral	Agree	
Knowledge Leakage	Disagree	Count leakage	0	0	1	1
		% Within	0.00	0.00	100.00	100.00
	Neutral	Count leakage	0	0	4	4
		% Within	0.00	0.00	100.00	100.00
	Agree	Count leakage	1	4	2	7
		% Within	14.30	57.10	28.60	100.00
	Strongly Agree	Count leakage	11	3	1	15
		% Within	73.30	20.00	6.70	100.00

Table 10: Chi-Square Tests knowledge leakage and impact on innovations

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	21.631[a]	6	0.001
Likelihood Ratio	22.548	6	0.001
Linear-by-Linear Association	13.119	1	0.000
Number of Valid Cases	27		

A. 11 cells (91.7%) have expected count less than 5. The minimum expected count is 26. The Chi-Square value obtained in Table 10 show that the association between knowledge leakage and impact on innovations was 21.631 with 6 degrees of freedom and a significance probability of 0.001, which was less than 0.05. That is χ2 (6) = 21.631, *P*=0.001 which was less than 0.05. These results show a high significant association between knowledge leakage and impact on innovations. Based on these result, there is enough evidence that there is an association between knowledge leakage and impact on innovations in the public universities of Kenya. The study concludes that

there is a very significant association between knowledge leakage and impact on innovations in the public universities of Kenya. This is in agreement with earlier finding on Islamic University of Gaza (Hammad, 2015).

The results on the symmetric measures are shown in Table 11. The symmetric measures results in table 11 indicate that the size effect based on phi test was very high at 0.895 (ϕ = 0.895). Thus, according to these results, mitigation of knowledge leakage within the public universities of Kenya would significantly impact on the innovations positively.

Table 11: Symmetric Measures for knowledge leakage and impact on innovations

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. sig.
Nominal by nominal	Phi	0.895			0.001
	Cramer's V	0.633			0.001
Interval by interval	Pearson's R	0.710	0.093	-5.046	0.000[c]
Ordinal by ordinal	Spearman correlation	0.744	0.109	-5.563	0.000[c]
Number of valid cases		27			

SUMMARY

Survey results indicate that there is knowledge leakage amongst teaching staff in Kenyan public universities as staff members are constantly moving from one school to another and also from departments and universities. This has deprived universities of valuable operational knowledge. The study established that knowledge leakage within Kenyan public universities is perpetuated through resignations, retirement and transfer of members of staff. Survey results indicate that retirement, dismissal, and death are not common challenges in Kenyan public universities.

CONCLUSIONS

Knowledge leakage highly impacts on innovations amongst teaching staff in public universities in Kenya, leads to loss of specialized expertise within the teaching, administrative and research ranks of the universities and is a potential risk under certain operational conditions.

RECOMMENDATIONS

In an effort to minimize effects of knowledge leakage, the mitigation measure to be employed should include; retirement and lecturer succession planning, conducting exit interviews for members of staff leaving, conduct prior counseling sessions, and issuing warnings prior to dismissal in order to give affected members an opportunity to rectify. This would instill confidence in the remaining members because it will portray the institution's administrative, professional, supportive attitude towards the organization and the employee. This would ensure continuity and assure the efficiency of knowledge delivery, especially if the replacements are equal to the tasks.

Other mechanisms that could be used to mitigate knowledge leakage should include: encouraging documentation of knowledge and skills; arranging forums for more experienced dons to share experiences with other staff, supporting continuous training in relevant skills especially through conferences, facilitating and organizing open lectures presided over by experienced dons from various schools, and establishing elaborate information storage and retrieval mechanisms. Critical knowledge from departing lecturers should be tapped through research skills, course content development, lecture preparation, teaching skills, exam setting, and marking skills. The skills should be immediately passed on to any new incoming lecturer to ensure continuity. The mechanisms put in place to retain a departing member of staff's knowledge include; mentoring other staff to be able to handle work; and keeping records of all the CATs, notes, exam results, and published papers.

Proposed Knowledge Sharing and knowledge Management Strategies that are Integrative of Inputs and Outputs in Public Universities

Critical knowledge from departing lecturers should be tapped through; research skills, course content development, lecture preparation, teaching skills, exam setting, and marking skills. The skills should be immediately passed on to any new incoming lecturer to ensure continuity. The tools to be used for tapping the knowledge includes; documentation of processes, lecture notes, laboratory procedures information sharing forums (between experienced members and less experienced ones.

In an effort to avoid the impact of knowledge leakage the universities should tap from departing lecturers by acquiring from their; e-learning material, exam setting; course outline, content organization and delivery. The members of the teaching staff should be inducted on course on preparation and class control; teaching techniques; how to handle students; and modern techniques for lecturers. Experienced and innovative members of staff should be given a chance to share out such knowledge so that in the event of their exit, the system is not hit in terms of the loss of knowledge.

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