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Efficacy of information and communication technology in digitalized students' records management in universities in Eastern Uganda

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ABSTRACT

This quantitative study examined the efficacy of adopting information and communication technology (ICT) in digitalized students' records management among university staffs in Eastern Uganda. The study used cross-sectional and descriptive survey designs. The target population was 402 staff members involved in students' records management, of which 129 participants were obtained using stratified, proportionate, and simple random sampling techniques. Data were collected using a self-administered questionnaire that measured the levels of ICT adoption and effectiveness of digitalized students' records management. Findings revealed that the level of ICT adoption and digitalised students' records management in the universities was generally moderately high. It was further revealed that an increase in the level of ICT adoption was associated with higher effectiveness of digitalized students' records management and vice versa. It was recommended that managements of the universities need to procure enough ICT equipment such as computers for the staff to promote effective digitalized students' records management. Training needs assessment and continuous professional training in the field of ICT was required all the time for the staff to keep abreast technological changes in students' records management.

Keywords: ICT adoption, records management, digital, university.

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INTRODUCTION

There is generally a drastic increase in complexity and use of information and communication technologies (ICTs) to conduct business and transmit information world over. This has been termed as digital migration in which information management is mainly by use of digital rather than analogue ICT devices. ICTs are instruments that facilitate creation, processing, and transmission of information by electronic means (Beckinsale and Ram, 2006; Luyombya, 2010). They embody a full range of old and new technologies such as radio, television, computers, internet, and telephones – both fixed and mobile, fax, printers, scanners and the print media. ICTs are therefore tools that enable the management of digital records.

According to Healy (2010), records management is a field of management responsible for the efficient and systematic control of the creation, receipt, maintenance, use, and disposal of records, including the processes for capturing and maintaining evidence of and information about business activities and transactions in the form of

records. Digital records on the other hand refer to records created, communicated, maintained, stored, retrieved, and/or disposed by means of computer technology (Duranti, 2010). It is an embracing term and includes those records created using computer technology (born digital) and those that are converted into digital format (*e.g.,* scans of paper documents). Digital records need to be managed well as part of the transition to the electronic environment. Failure to do this could have far reaching implications, such as loss of records – leading to serious business, legal, financial and academic consequences.

ICT adoption and digitalised records management in educational institutions started around the 19th century in western countries. Asogwa (2012:198) posits that the field is new to most records officers and archivists in contemporary sub Saharan Africa. It transformed the traditional mode of recordkeeping and brought with it some constraints which records managers have to contend with if they are to remain relevant in the information society.

Two new developments led to the expansion of the records management industry in Africa in 1970s. First, computers were introduced to business; and second, new legislation in the 1970s required businesses to start retaining records for certain periods. These two factors gave birth to even greater levels of records management including use of electronic file storage.

Records management in Uganda evolved in 1980s from barcode scanners to compact disks (CD). Ugandan universities took on the innovation in 1990s leading to greater efficiency gains for the records management field (Healy, 2010). However, ICT adoption in digitalized students' records management in Ugandan universities seems to be problematic. A survey by Luyombya (2011) reveals a critical gap in infrastructural investment in ICT across majority of the government departments and institutions in Uganda. The generation of students' records from application through admission, registration, examination to graduation is marred with numerous incidences of misplaced hardcopy academic documents as well as mutilated or incomplete students' files. Consequently, delayed assessment results, congested libraries, and missing examination marks are common occurrences in most universities in Uganda.

On the other hand, Bansode and Pujar (2008) as well as Breeding (2009) argue that digital storage media are fragile, with a limited shelf life. Worse yet, the digital information on storage media will be rendered unreadable by obsolescence of technology (Bansode and Pujar, 2008), which is the fact that as information technology evolves, older systems disappear taking with them the ability to read the information they managed. This agrees with the Records Lifecycle theory (Atherton, 1985) which posits that a record has a life which is divided into stages, that is, it is born (created), it lives (used and maintained), and it dies (gets disposed of).

The implication of the Records Life Cycle theory is that students' digital information and records are at high risk of degrading or being irretrievably lost due to constantly changing technology. Yet government and stakeholders need to be able to access the information for much longer than this period of time in order to review, evaluate, and develop policy, to conduct day-to-day business, and to prepare for the future. Ugandan universities have traditionally faced a challenge of poor students' (digital) records management, limited resources – financial, material, and human. The introduction of ICT presents challenges to managing digital records held in ICT systems. Moreover, ICT initiatives appear not to be well coordinated in Uganda and there seems no plan of how digital records will be managed. This raises the problematic issue as to whether an integrated framework for effective management of digital records could be a key function of the Ugandan universities, with particular reference to those in Eastern Uganda.

A student's record is always linked to an educational organization's official business and maintained as evidence. For example, a transcript will be kept as a university student's record of an academic institution as evidence of its business. The demise of such a record by degradation or loss would constitute a big challenge for the universities. With this challenge, it was envisaged that the level of adoption of ICTs in the universities would influence the efficiency of digitalized students' records management and thus call for effective research. This study was therefore purposed to investigate the efficacy of ICT adoption in digitalized students' records management. The objectives of the study included the following:

1. To determine the level of ICT adoption by staff in the universities in Eastern Uganda.
2. To determine the level of effectiveness of digitalized students' records management in the universities in Eastern Uganda.
3. To examine the relationship between the level of ICT adoption and the level of effectiveness of digitalized students' records management in the universities in Eastern Uganda.

METHODOLOGY

The study employed cross-sectional and descriptive

survey designs. The target population for the study included records staffs in selected public and private universities in Eastern Uganda. Six universities were surveyed including Makerere University Business School (MUBS), Uganda Christian University (UCU), Islamic University in Uganda (IUIU), Livingstone University, Uganda Christian University (UCU), Bugema University, and Busitema University. A total of 402 staff members were targeted to participate in the study including administrative staff (N = 51), records assistant (N = 301), and academic heads of departments (N = 50). Stratified, proportionate, and simple random sampling techniques were employed with the aid of Krejcie and Morgan's (1970) table for sample size determination to select a sample size of 129 participants, distributed as follows: administrative staff (n = 28), records assistants (n = 101), and academic heads of departments (n = 28).

A self-administered questionnaire having three sections including a demographic section, ICT Adoption questionnaire, and digitalized students' records management questionnaire was used for data collection. The demographic section captured biodata details of the respondents such as name, sex, marital status, age, years served in the university, religion, and so on. The ICT adoption questionnaire had 20 items while the digitalized students' records management questionnaire had 28 items. The Cronbach alpha reliability coefficients were respectively .89 and .73.

Data in the complete questionnaires were coded and entered in Statistical Package for Social Scientists (SPSS) software version 20. The data were then analysed to generate frequencies and percentages, means and standard deviations for the levels of ICT adoption and efficiency of digitalized students' records management in the universities. A Pearson product moment correlation coefficient was run to establish the correlation between the level of ICT adoption and efficiency of digitalized students' records management in a bid to examine the efficacy of the former variable in the latter.

RESULTS AND DISCUSSION

The biodata considered in the study included personal information; age range, gender, marital status, religious affiliation, the departments of the respondent, level of education, and the working experience in years. This demographic information is summarized in Table 1.

The sample distribution in Table 1 indicates that majority of the participants were male in the age range 30-39, 51 (39.5%); Education level of degree, 51 (39.5%); married,93 (72.1%), and Anglicans by religious affiliation 40 (31.0%). Most of them were under Academic Registrar department 42 (32.0%); and had worked for a period ranging from 3 years and below21 (16.3%). Age ranged from 20 to 60 above; mean age was 35.13 (SD = 9.13).

Level of ICT adoption by staff at universities in Eastern Uganda

Objective 1 was set to determine the level of ICT adoption by staff at universities in Eastern Uganda. Results indicate that the staff generally rated the effectiveness of ICT adoption at universities as high (M = 47.42, SD = 4.74). The numbers of respondents per level of effectiveness by bio data are presented in Table 2.

Results indicate that the staff generally rated the level of ICT adoption in universities in Eastern Uganda as high. Similar findings were earlier obtained by Lindsay et al. (2006) and Tusubira (2005). These studies point out the need for any modern institution of higher learning to critically tag its records management to the smooth operation of the new innovations of Information and Communication Technology. Congruent with DeVon's (2004) finding, this study revealed that the available ICT facilities like computers and word processors, excel enhance recording and keeping of students assessed /evaluated work. This points out a key factor in reducing the bureaucratic process of manually recording and keeping a pile of files.

However, results of the study by British Educational Communications and Technology Agency ([BECTA], 2000) indicate that there was a low level of ICT adoption. The reasons for the low level of ICT adoption may include the fact that most respondents reported that there were few equipment such as computers for the staff and this affects adoption of ICT. This implies that for a staff to have adopted ICT in today's job, she/he needs to be equipped with the right skills and computers so as to boost the competence of handling digital students' records.

The results (Table 2) further reveal that a greater fraction of males rated the level of ICT adoption as high compared to females. This is in line with findings of a study carried out by Lindsay et al. (2006). This possibly could be due to the explorative nature of males, in which they can teach themselves ICT skills more than females can do.

A great percentage of the staff with qualifications of bachelor's degree rated ICT adoption as high. This is

Table 1. Sample demographics.

Characteristics	Category	*N*	%
Age range	20-29 years	35	27.1
	30-39 years	51	39.5
	40-49 years	35	27.1
	50- 59 years	5	3.9
	60+ years	3	2.3
Gender	Male	89	69.0
	Female	40	31.0
Level of education	Certificate	9	7.0
	Diploma	33	25.6
	Degree	51	39.5
	Masters	30	23.3
	Others	5	3.9
Department of work	Dean of Student	27	20.9
	University Secretary / Principle	27	20.9
	Academic Registrar	42	32.6
Marital status	Single	34	26.4
	Married	93	72.1
	Widowed	2	1.6
Religious affiliation	Anglican	40	31.0
	Catholic	31	24.0
	Muslim	28	21.7
	Pentecostal	27	20.9
	Seventh Day Adventist	3	2.3

also similar to the findings of the study by Lindsay et al. (2006). This possibly means that the staff with the above qualifications had a lot of experience in ICT from the Universities towards the digitalized students' records management.

None of the staff in the departments of Dean of Students and University Secretary rated the ICT adoption as high. This means that the staffs under those two departments were dissatisfied with the ICT adoption. A similar study by Luyombya (2011) revealed gaps in structural and administrative ICT investment in Ugandan public service. It is possible that poor digital records management associated with lack of computers can be experienced in a public university. Such a finding implies that the university management should play its role to avail ICT gadgets in the workplace for staff to perform their digital duties.

Level of effectiveness of digitalized students' records management in universities in Eastern Uganda

Objective 2 aimed to determine the level of effectiveness of digital students records management at universities in Eastern Uganda. The results indicated a generally moderate effectiveness of digitalized students' records management (M = 59.46, SD = 14.27). Further distribution of the effectiveness of digitalized students' records management as reported by respondents of different demographic backgrounds is presented in Table 3.

The results indicate that digitalized students records management was generally moderate. This is similar to results obtained by Lindsay et al. (2006). Similar results were also obtained by DeVon (2004) who noted that recording data electronically, storing it centrally, and

Table 2. Level of ICT adoption.

Biodata	Categories	Effectiveness of ICT Adoption		
		Low (%)	Moderate (%)	High (%)
Age	20-29 years	0 (0.0)	12 (34.3)	23 (65.7)
	30-39 years	1 (2.0)	29 (56.9)	21 (41.2)
	40-49 years	1 (2.9)	15 (42.9)	19 (54.3)
	50- 59 years	0 (0.0)	1 (20.0)	4 (80.0)
	60+ years	0 (0.0)	0 (0.0)	3 (100.0)
Gender	Male	1 (1.1)	38 (42.7)	50 (56.2)
	Female	1 (2.5)	19 (47.5)	20 (50.0)
Education level	Certificate	0 (0.0)	1 (11.1)	8 (88.9)
	Diploma	2 (6.1)	15 (45.5)	16 (48.5)
	Degree	0 (0.0)	25 (49.0)	26 (51.0)
	Masters	0 (0.0)	16 (53.3)	14 (46.7)
	Others	0 (0.0)	0 (0.0)	6 (100.0)
Department	Dean of Student	1 (3.7)	13 (48.1)	13 (48.1)
	University Secretary / Principle	0 (0.0)	12 (44.4)	15 (55.6)
	Academic Registrar	0 (0.0)	18 (42.9)	24 (57.1)
	4.00	0 (0.0)	4 (66.7)	2 (33.3)
	5.00	1 (3.7)	10 (37.0)	16 (59.3)
Marital status	Single	0 (0.0)	12 (35.3)	22 (64.7)
	Married	2 (2.2)	43 (46.2)	48 (51.6)
	Widowed	0 (0.0)	2 (100.0)	0 (0.0)
Religion	Anglican	1 (2.5)	21 (52.5)	18 (45.0)
	Catholic	0 (0.0)	14 (45.2)	17 (54.8)
	Muslim	0 (0.0)	13 (46.4)	15 (53.6)
	Pentecostal	1 (3.7)	9 (33.3)	17 (63.0)
	Seventh Day Adventist	0 (0.0)	0 (0.0)	3 (100.0)

sharing it with colleagues are vital to reducing workloads through available ICT structures. The present findings therefore imply that staff of the universities should be encouraged to participate in digitalized students' records management so as to increase the level of effectiveness of digitalised students' records management.

Majority, 23(65.7%), respondents rated the effectiveness of digitalised students' records management at universities in Eastern Uganda as high, 18(64.3%) rated it as moderate, while a small number only 3(10.7) rated it as low. This means that digitalised students' records management at universities in Eastern Uganda has got very few loopholes, enough strengths and some areas of weaknesses that need to be addressed is generally minimal. Five (100.0%) of the staff with qualifications higher than masters' degrees rated the digital students records Management effectiveness as high. This means that staff in this category of education level probably had higher knowledge about digital students' records management.

Digitalised students' records management effectiveness being high was distributed by department as follows: Dean of Students 10(37.0%), University secretary 11(40.7%), and Academic Registrar 16 (38.1%). Low digitalised students' records management effectiveness by marital status increased in the order married 31(33.3%), widowed 1(50.0%), and single 17(50.0%). This means that the married staff were more

Table 3. Digitalized students' records management effectiveness levels in universities in Eastern Uganda.

Biodata	Category	Digitalised students' records management effectiveness levels		
		Low (%)	Moderate (%)	High (%)
Age range	20-29 years	390 (8.6)	14 (40.0)	18 (51.4)
	30-39 years	17 (33.3)	22 (43.1)	12 (23.5)
	40-49 years	8 (22.9)	12 (34.3)	15 (42.9)
	50- 59 years	0 (0.0)	2 (40.0)	3 (60.0)
	60+ years	0 (0.0)	2 (66.7)	1 (33.3)
Gender	Male	21 (23.6)	33 (37.1)	35 (39.3)
	Female	7 (17.5)	19 (47.5)	14 (35.0)
Level of education	Certificate	0 (0.0)	1 (11.1)	8 (88.9)
	Diploma	8 (24.2)	12 (36.4)	13 (39.4)
	Degree	12 (23.5)	21 (41.2)	18 (35.3)
	Masters	8 (26.7)	15 (50.0)	7 (23.3)
	Others	0 (0.0)	3 (60.0)	2 (40.0)
	VC /Rector	0 (0.0)	0 (0.0)	1 (100.0)
Which department do you work with	Dean Of Student	10 (37.0)	7 (25.9)	10 (37.0)
	University Secretary / Principle	3 (11.1)	13 (48.1)	11 (40.7)
	Academic Registrar	7 (16.7)	19 (45.2)	16 (38.1)
	VC	2 (33.3)	4 (66.7)	0 (0.0)
	Others	6 (22.2)	9 (33.3)	12 (44.4)
Your marital status	Single	2 (5.9)	15 (44.1)	17 (50.0)
	Married	25 (26.9)	37 (39.8)	31 (33.3)
	Widowed	1 (50.0)	0 (0.0)	1 (50.0)
Religious affiliation	Anglican	9 (22.5)	18 (45.0)	13 (32.5)
	Catholic	8 (25.8)	11 (35.5)	12 (38.7)
	Muslim	6 (21.4)	10 (35.7)	12 (42.9)
	Pentecostal	5 (18.5)	11 (40.7)	11 (40.7)
	Seventh Day Adventist	0 (0.0)	2 (66.7)	1 (33.3)
Total		28 (21.7)	52 (40.3)	49 (38.0)

knowledgeable with the digitalised students' records management at the universities compared to the singles. By religious affiliation, low digitalised students' records management effectiveness decreased in the order of Pentecostals 5 (18.5%), Catholics 8 (25.8%), Muslim 6 (21.4%), Anglican 9 (22.5%), seventh day Adventists a 2 (66.7%). This probably means that religion is a factor in interpreting the effectiveness of digitalised students' records management in Universities with staff of certain religious affiliations, feelings biased or more favoured. By gender, males (56.1%) generally rated the level of their digitalised students' records management as high compared to females (52.3%). This implies that males were more satisfied with the use of digitalised students' records management.

Relationship between the effectiveness of ICT adoption and digitalized students records management in Eastern Uganda

Objective 3 examined the relationship between the

effectiveness of ICT adoption and digitalised students' records management. ICT adoption works towards the improvement of digitalized students' records management. Results indicate that there was a moderate correlation between the level of ICT adoption and the effectiveness of digitalised students' records management (r =.46, p < .01). This helps in the achievement of the overall ambitions of the university goals. This means that higher effectiveness of digitalised students' records management is realized as the level of ICT adoption increases. In other words, digitalized students' records management at universities in Eastern Uganda was moving hand in hand with the adoption of ICT.

This result implies that when ICT adoption is managed with high effectiveness, then the digitalised students' records management is high. This finding is in tandem with that of Tusubira (2005) who asserts that any modern institution of higher learning is critically dependent on the smooth operation of the new innovations of Information and Communication Technology. The author further notes that a low level of ICT adoption contributes to low levels of digitalized students' records management in universities whereas high level of ICT adoption also contributes to high level of digitalised students' records management in universities.

BECTA (2000) stressed that ICT is helpful in supporting management functions. For example, e-registration enables management of attendance via analysis of data and can be supported by automatic communication to parents via SMS messaging and email. Use of ICT improves collaboration with other stakeholders of the university. This is done through effective communication enhanced by use of emails, SMS and some announcements on the websites of the universities. In their research, Lindsay et al. (2006) observed that electronic registration could play an important role in helping universities with high rates of absenteeism to improve attendance, it saves time, and lesson monitoring is particularly benefitted. E-registration is part of digitalised students' records management might be beneficial especially to universities with enough ICT facilities.

It can be argued that due to diffusion of ICTs in education institutions, work can radically change; ICTs offer tremendous possibilities in improving and developing administrators' professional capability. This strengthens institutional capacity to handle administrative work since tasks can be accomplished effectively and efficiently. However, as argued by Asogwa (2012), introducing technological solutions to e-records management without first addressing certain necessary preconditions would increase the vulnerability of public records and jeopardize public services. Yusof and Chell (2002) on their part agree that records management is undervalued and suffers from the influence of irrelevant traditional concepts. In such cases, it is necessary to streamline administrative procedures and ensure a safe environment for operating the ICT gadgets to maximize e-records management.

CONCLUSIONS

The level of ICT adoption in universities in Eastern Uganda was rated as high. This implies that the staff perception of ICT adoption in the universities was high. The staff were using both paper and modern ICT for handling business in the universities. Therefore, there was need to invest in ICT, both structural and functional components, among the staff.

The level of effectiveness of digitalized students' records management was generally moderate among the staff of the universities of Eastern Uganda. In other words, there was substantial training needed to enhance digitalized records management among the staff.

The relationship between the level of ICT adoption and the effectiveness of digitalized students' records management was moderate. A higher level of ICT adoption would enhance a higher level of digitalised students' records management effectiveness, and consequently a higher level of digital students' records management and a vice versa.

RECOMMENDATIONS

The study recommends that the universities can achieve a desired level of ICT adoption by procurement of ICT equipment like computers for the university staff, more so for those handling records of students. The staff need to be encouraged to participate in digital students records management workshops so as to improve on the effectiveness of digital records management. This can be achieved through equipping offices with electronic equipment in all facilities at the working areas of all universities in Eastern Uganda.

There is need for continuous ICT training so as to equip staff with the knowledge in ICT and digital records management. New forms of continuous ICT professional development need to be implemented in the universities as part of a culture of lifelong and peer learning. In addition, universities need to integrate the ICT strategy into the university overall strategies in relation to the use

of ICT.

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