

**INFORMATION COMMUNICATIONS TECHNOLOGY AND ACADEMIC RECORDS  
MANAGEMENT AT KYAMBOGO UNIVERSITY**

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**A DISSERTATION SUBMITTED TO GRADUATE SCHOOL IN PARTIAL  
FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF  
THE MASTER'S DEGREE IN ORGANIZATION  
AND PUBLIC SECTOR MANAGEMENT**

**APRIL, 2021**

**DECLARATION**

I, Nalumansi Ruth, declare that this dissertation titled “*Information Communications Technology and Academic Records Management at Kyambogo University*” is my original work and has never been submitted to any university or institution for award of a degree or any other award.

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**APPROVAL**

This is to certify that this dissertation titled “*Information Communications Technology and Academic Records Management at Kyambogo University*” carried out by Nalumansi Ruth, was done under our supervision and is now ready for submission to the graduate board with our approval in partial fulfillment of the requirements for the award of degree of Master’s Degree in Organization and Public Sector Management of Kyambogo University.

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## **DEDICATION**

To my beloved mother, Florence Nawati, my father, Samuel Nabugulu my beloved husband, Mr. Kahaika Levi and my children Pauline, Esther, Abigail, who found my absence inconveniencing during my pursuit of the Masters course.

**God Bless You Abundantly**

## **ACKNOWLEDGEMENT**

I wish to extend my sincere appreciation to all those who helped me to complete this research report without whom this work would not be in its present form. I wish to acknowledge the Almighty God for the wisdom, strength and knowledge. I would like to thank my supervisors, Dr. Madinah Nabukeera and Dr. Hannah Muzee for their parental guidance. This study would not have been successfully carried out without their invaluable professional guidance, advice, encouragement and time accorded to me.

Special thanks go to Kyambogo University staff and management for providing an enabling environment that made me attain this Master's Degree. I am indebted to my lecturers in the Post Graduate School for the work done in transforming and imparting knowledge and skills for service in me.

I would like to whole heartedly appreciate my beloved husband, for the support, patience and encouragement during the pursuit of my studies. I am indeed grateful to my brothers and sisters for the spirit of cooperation.

Finally, I appreciate the services of the secretary for her tireless efforts in typesetting this research report with due care.

**MAY THE ALMIGHTY GOD BLESS YOU**

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## **LIST OF ABBREVIATIONS/ACRONYMS**

|               |   |
|---------------|---|
| <b>ADB</b>    | : African Development Bank  |
| <b>AIMS</b>   | : Academic Information Management System                                      |
| <b>AIT</b>    | : Advanced Information Technologies   |
| <b>AST</b>    | : Adaptive Structuration Theory   |
| <b>CD</b>     | : Compact Disk  |
| <b>CGPA</b>   | : Cumulative Grade Point Average  |
| <b>CIA</b>    | : Confidentiality, Integrity, and Availability                                |
| <b>CPU</b>    | : Central Processing Unit   |
| <b>CVI</b>    | : Content Validity Index  |
| <b>DVD</b>    | : Digital Video Disk  |
| <b>EDMS</b>   | : Electronic Document Management System                                       |
| <b>EDP</b>    | : Electronic Data Processing  |
| <b>ERMS</b>   | : Electronic Records Management System  |
| <b>ICT</b>    | : Information and Communication Technology                                    |
| <b>ISO</b>    | : International Organization of Standards                                     |
| <b>ITEK</b>   | : Institute of Teachers Education Kyambogo                                    |
| <b>JPEGs</b>  | : Joint Photographic Experts Group  |
| <b>KyU</b>    | : Kyambogo University   |
| <b>MICTNC</b> | : Ministry of Information and Communications Technology and National Guidance |
| <b>MLE</b>    | : Managed Learning Environment  |
| <b>NITA-U</b> | : National Information Technology Authority-Uganda                            |
| <b>PDFs</b>   | : Portal Document Format  |
| <b>RAM</b>    | : Random Access Memory  |
| <b>RoM</b>    | : Read Only Memory  |
| <b>UHD</b>    | : Ultra High Definition   |
| <b>UNCST</b>  | : Uganda National Council of Science and Technology                           |
| <b>UNISE</b>  | : Uganda National Institute of Special Needs Education                        |
| <b>UPK</b>    | : Uganda Polytechnic Kyambogo   |
| <b>USA</b>    | : United States of America  |
| <b>USB</b>    | : Universal Serial Bus  |
| <b>VLE</b>    | : Virtual Learning Environment  |
| <b>WIFI</b>   | : Wireless Fidelity   |

## ABSTRACT

The focus of this study was to examine the effect of information communications technology on academic records management at Kyambogo University. The study was guided by the following specific objectives to: assess the effect of the availability of ICT Hardware on academic records management; examine how the Quality of ICT Software affects academic records management and establish the relationship between ICT human resources competence and academic records management of Kyambogo University. The study reviewed related literature critically evaluating and analysing previous studies literature gaps to inform the current study. The study adopted a cross-sectional research design. A sample size of 384 respondents derived using Bartlett, J. et al. (2001) participated in the study. Purposive sampling technique, simple random sampling as well as stratified sampling techniques were used to select different categories of staff. The study tools used were; questionnaire survey for quantitative data, interviewing and documentary review for qualitative data. Data was analysed using means, correlations and regression techniques. The findings revealed that availability of ICT Hardware and the quality of ICT software account for only 30.5% of the variations (changes) in academic records management at Kyambogo University. The quality of software for better management of students' academic information was secure and safe in terms of providing; Confidentiality, Integrity, and Availability (CIA). The found out that a moderate significant positive relationship exists between ICT human resources competencies and academic records management of Kyambogo University ( $p=.464 \leq 0.000$ ). In a nutshell, the study deduced that: KyU uses AIMS with efficient availability of ICT equipment such as desktop computers, laptops, internet access facilitates reduction of rampant missing results; protection of information remained a major challenge since the beginning utilization of AIMS in KyU. Results coordinators at KyU have inadequate capacity and skill gaps to efficiently and effectively manage students' academic records. The study recommends that: accessing WIFI from open space computer laboratories by many students causes congestion and hence more hardwares should be purchased to easily access examination results upon logging in into the system. The study recommends that AIMS software should be designed to suit the user needs and to govern all loop holes within the ICT policy framework of the University. Results coordinators should be re-training through refresher courses to undertake full responsibilities of records management. The study suggested that further research should be conducted to explore; The relationship between ICT and e-learning in private universities in Uganda and to investigate the extent to which ICT influences student academic achievement; a comparative analysis of private and public universities in Uganda.

# **CHAPTER ONE**

## **INTRODUCTION**

### **1.0 Introduction**

The focus of this study was to investigate the effect of information communications technology on academic records management at Kyambogo University taking academic information management system as a case study. Management of students' academic records propels sustainability of institutions. However, inefficient management of academic records has consistently recurred despite the development adoption and use of ICTs (Lubaale, 2020). This therefore instigated the need for this study. This chapter covers the background of the study, the problem statement, purpose, objectives, research questions, research hypotheses, conceptual framework, justification, significance and the scope of the study.

### **1.1 Background to the Study**

This background approach is presented basing following a recommendable approach, namely: historical, theoretical, conceptual and contextual backgrounds as below;

#### **1.1 Historical Perspective**

Globally, the interesting origin of formal records management is traced way back in 1786 in the Majesty's stationery office. A number of specialised document storage facilities existed during the post- World War II economic boom in the 1950s and 1960s (Adebayo, 2013). A significant change in records management in the world came into play with the introduction of computers in the 1970s. An increasing rate of document production and the development of document retention laws stimulated the need for even more sophisticated levels of records management (Asogwa, 2012). Worldwide the implementation of technology in institutions started way back in 1950s with three objectives for information system use: to improve institutional efficiency by automating information processing, to improve management effectiveness by satisfying information needs and to improve competitiveness by affecting the business strategy (Seyal, 2019).

Globally, Information and Communication Technology was first used in educational institutions in North America and Europe in 1970s. In these Countries, computers are used to enable successful learning in e-learning and to provide professional development for multiple staff in a learning

institution and school management systems (SMS), enabling them to be more effective (Clarke-okah, Ferreira, & Kwan, 2009). This led to digitization of stored files (Bryman, 2016).

In the late 20<sup>th</sup> and early 21<sup>st</sup> century, the invention of digital scanners enabled automatic conversion of files. This is an enormous time-saver (Asogwa, 2012). Mutisya (2017) argues that in recent times, there has been a global explosion in the use of computers in schools as an instructional, communicative and informational resource tools by use of databases, spreadsheets, multimedia, email, and network search engines. Abuga (2014) stipulates that ICT integration plays a vital role in supporting powerful and efficient school management in the education sector. Brannigan (2010) believed that the reengineering approach is a valuable way of rethinking the nature of school leadership and management to meet the challenges of the twenty-first century.

In Africa, the first computers arrived in educational institutions by the end of the 1970s to ease the burden of management in monitoring and managing the students' academic records activities hence just by click of a button (Mutisya, 2017).

East African countries like Kenya, the culmination of ICT policy has been the development of the E-government Strategy, National ICT Draft Policy, and the issuance of the National Access Report (NITA, 2010). In the education sector, the creation of various institutional websites has become the order of the day in the Ministry of Education, Science and Technology (Saaka, 2011).

The Uganda Government launched a National ICT policy framework in 2006 to promote digital literacy and ICT integration in educational institutions across the country (McLeod, 2012). The Uganda Ministry of Education and Sports sought varied means such as embracing ICT in the learning process of incorporating new technologies in the education system (Kayiwa, Raihan & Kum, 2016). In Uganda, the national ICT policy development process was initiated in 1998 by the Uganda National Council of Science and Technology (UNCST) to embrace the goal of lifelong education for all. Uganda developed its initial ICT national policy in 2003 (Ochwo, Atibuni, & Sekiwu, 2018).

The National Information Technology Authority-Uganda (NITA-U) is an autonomous statutory body established under the NITA-U Act 2009, to coordinate and regulate Information Technology

services in Uganda. NITA-U is under the general supervision of the Ministry of ICT and National Guidance. Ministry of Information and Communications Technology and National Guidance (ICT & NG) is a Government Ministry providing strategic and technical leadership, overall coordination, support and advocacy on all matters of policy, law, regulation and strategy for the ICT sector. The ICT ministry was created in 2006 (MICTU, 2016). The ministry is mandated to provide leadership, coordination, support and advocacy in the formulation of policy, laws, regulations and strategy for the ICT sector in Uganda, to foster the achievement of national development goals.

At Kyambogo University (KyU), there have been initiatives to produce ICT based educational content (Okedi, 2015). KyU adopted ICT policy in 2015 as an administrative and education management tool under its e-Kampus platform introduced in 2013 to focus on providing education managers and administrators with accurate and timely data (Kyambogo University Information and Communication Technology Policy, 2014). e-Kampus was in 2018 upgraded to AIMS and is currently handling; admissions, registration, results, transcripts processing and fees payments are automated (Nangonzi, 2016).

### **1.1.2 Theoretical Perspective**

The study was guided by Adaptive Structuration Theory (AST) by Giddens in 1984 and supported by records life cycle theory (Schellenberg, 1934). Adaptive Structuration Theory examines the role of advanced information technologies (AIT) and variations in organization change from two aspects: the type of structures that are provided by AIT (and, hence, anticipated by designers and sponsors) and the structures that actually emerge in human action as people interact with these technologies, and incorporate them in their work practices (Giddens, 1984). AST as applied to original ICT purposes associated (i.e., ability to interact with organizations, contact with friends and family, self-publishing, etc.). This covers maintenance and appraisal of digital information over its entire life cycle (Sinclair & Vogus, 2011; Rains & Bonito, 2017).

Similarly, the Life Cycle Theory (LCT) advanced by Schellenberg (1934) holds that recorded information has a “life”, it lives (maintenance and use phase) and it dies (disposition phase). The LCT defines who will manage the record during each stage just like AST (Berner, 1983). Both

LCT and AST permit effective management of academic records (what Berner calls responsible records use and administration) requires ongoing cooperative interaction between the records manager and the archivist in order to: ensure the creation of the right records, containing the right information, in the right format; organize the records and analyze their content and significance to facilitate their availability; make them available promptly to those (administrators and researchers alike) who have a right and a requirement to see them; systematically dispose of records that are no longer required; and protect and preserve the information for as long as it may be needed (if necessary, forever).

Although formerly, the life cycle concept only fits successfully into paper-based records management while AST outbursts well ICT records, incorporating the two theories would complement each theory's limitations to reach a definite inactive point. This would aid raw academic records to be transacted into information, migrated and converted by hardware and software in order to be readable by their creators and users (Pearce-Moses, Richard, 2005 & FEA 2005). Application of the two theories helped to incorporate the different characteristics of ICT and academic records management appropriateness.

### **1.1.3 Conceptual Review**

International Organization for Standardization, ISO (2001) defines a record as information created, received and maintained as evidence and information by an organisation or a person in pursuance of legal obligations or in the transaction of business. Cox (2001) cited in Musembe, (2016) on the other hand, opine that records is an extension of human memory, purposefully create to record information, document transactions, communicate thoughts, substantiate claims, advance explanations, offer justifications and improve lasting evidence of events. Academic records management is a program designed to systematically control or monitor records during their entire lifecycle from creation or receipt to disposal. Records are information fixed on any of the media; Word documents –Spreadsheets –PDFs –JPEGs –DVDs, Databases, videos and photographs and paper documents.

Records as defined by the American Heritage Dictionary (1980) cited in Onifade (2012) are information or data on a particular subject collected and preserved. As defined, the academic



records refers to information or data relating to students both in paper and electronic formats that provides evidence of and information about the actions or events that happened. The National Archives of Scotland (2013) defined records management as the systematic control of an organization's records, throughout their life cycle, in order to meet operational business needs, statutory and fiscal requirements, and community expectations (The National Electronic Commerce Coordinating Council, 2014).

Records management is therefore a vital information tool; records relay information about an activity, they provide evidence that an activity occurred and therefore they serve as a benchmark by which decisions are made. This is evidenced by scholars Ndenje-Sichalwe, (2011) who observe that records are valuable assets that need to be managed and protected. Besides providing essential evidence of organizational activities, transactions and decisions; records also support business functions and are critical for organisational performance.

Ngoepe (2008) states that appropriate records management programme will help an organisation to conduct business in an efficient, accountable manner, deliver services consistently, support managerial decision making. Ngoepe also holds that records management aid attainment of transparent policy formulation and ensure continuity in policy execution. Further still, records management and administration help organisations to respond to planned or unplanned events such as audits or disasters. Above all, records management enables institutions to meet regulatory and audit requirements; provide evidence of organizational activity for litigation support (Ngoepe,2008).

An effective management programme will ensure that records are available for use when needed, that privacy and confidentiality are maintained and that redundant records are destroyed. As indicated from the above benefits accrued from proper management of records, organisations have a mandate to ensure proper management of records to all their business process and systems so as to enhance quality service delivery to its clients (Luyombya, 2011).

Sound Records management for institutions help yield good results through availability of information. It enhances service delivery and growth of an organisation. Records management should be part and parcel of the strategic function of an organisation (Kasozi, 2012).

ISO (2001) state that, the objective of records management are to set policies and procedures, assign responsibilities for records management at various levels within the organisation. ISO goes on to reveal that records management helps to set best practice standards, process and maintain records retention and disposal policy, process and maintain records in safe and secure storage, implement access policies. Above all it also aids to integrate records management into business systems and processes, assign, implement and administer specialized systems for managing records, and provide a range of services relating to the management and use of records (Chifwepa, 2013).

Popoola, (2010) reveals that University academic records are created or received by a department or an employee of the university become the property of the university. Academic records created or received by faculty in the conduct of student advising, committee work, administration, or university program, school and department administration are also university records. Exceptions include faculty manuscripts, teaching and research notes.

Records carry the history of organisations and history cannot properly be told to the future generations if records are not properly and systematically kept. Information is a fundamental resource for both government and private sectors alike and can be maintained and enhanced through appropriate records management (Onifade, 2012).

Chifwepa (2013) observed that records management ensures that information can be accessed easily, can be destroyed routinely when no longer needed, and enables organisations not only to function on a day-to-day basis, but also to fulfill legal and financial requirements ((Kasozi, 2012). ICTs consist of the hardware, software, networks, and media for collection, storage, processing, transmission and presentation of information (voice, data, text, images), as well as related services (Tusubira & Mulira, 2012). Information Technology (IT) that refers to the hardware and software of information collection, storage, processing, and presentation of records (Toyo, 2017).

Tusubira and Mulira (2012) argued that at the organizational level, it is widely accepted that the integration of ICT in organizational functions is necessary for increased efficiency, cost-effectiveness and competitiveness. The adoption of ICT in organisations has improved on the performance of tasks (Wamukoya, 2012). McDonald (2014) opined that the application of

Information and Communication Technology (ICT) to the management of records in offices therefore, will go a long way in making such records accessible and usable. ICT facilities are applied in the management of records in government offices include in the creation of records, processing of records and documents, in the storage of high-volume records, retention / disposal of records and in the retrieval of records and documents, that ICT has numerous benefits and has successfully changed the practices of records management (Wamukoya, 2012).

#### **1.1.4 Contextual Perspective**

Kyambogo University came into existence after merging of three former institutions namely Institute of Teachers Education Kyambogo (ITEK) and Uganda Polytechnic Kyambogo (UPK) while Uganda National Institute of Special Needs Education (UNISE) joined in 2003. According to the IGG's Report (2015) cited in Namubiru, Onen & Oonyu, (2017). The University's Strategic Plan of 2012/13 – 2022/23 defines the systematic direction of the growth of KyU as stated in its motto of advancing “knowledge and skills for service” in all areas of research, engineering, teacher education, special needs, technical science, vocational education and outreach activities. In order to realize this, the university is steadily expanding its ICT resources and services. This saves cost, time and labour while increasing both productivity and efficiency in terms of information processing, accessibility, dissemination, retrieval and disposal.

Kyambogo University currently has an Academic Information Management System (AIMS), an upgraded E-kampus used in students' admission, creation of academic records within the students' portals, storage, access, and retrieval of examination results, fees payment, registration, online confirmation and verification of students' transcripts (Kyambogo University Strategic Plan 2012/13 - 2022/23). Since 2013 management of students' tests, course works, examinations marks, grades and issuing of transcript prints have remained inadequate (Serwaniko, 2012).

#### **1.2 Statement of the Problem**

Theoretically, proper academic records management through appropriate strategies, procedures and standards; aids creation and maintenance of reliable records and the preservation of their authenticity over time for institutions to be able to stand for the content of trustworthy (Musembe, 2016). Nevertheless, at Kyambogo University, academic records management system is inadequate as this has been evidenced by failure of the Academic Information Management System

(AIMS) to; upload and update marks, access information, complete tasks in time, low operations precision, register students, post actual tuition figures and has difficulties in migrating data from the old system (Ndyabahika, 2018). Falsification of admission process, forgery of registration and examination cards, indicate that academic records are not well managed in the University (Kolya, 2018). Findings from the Auditor General's investigation on KyU, 2015 indicate uncoordinated ICT investments that are not properly aligned to the University's noble course. Students have continued to register missing marks even upon graduation, transcripts with wrong credits/grades, and untimely release of examinations have also remained rampant (Ssebwami, 2019). It is not clear as to whether ICT infrastructures are inadequate to resolve the academic records management ineptitudes (Mbabaali, 2017). The University has tried to obtain funding to a tune of \$1.9m from ADB to invest in ICT infrastructure development, set up three thin-client based computer laboratories, equipped and developed staff knowledge, skills and competencies but the problem has persisted (Okuonzi, 2019 & Kyambogo University, 2019). The likely consequence of poor management of students' academic records, is that KyU will have many cases of forgery of transcripts, have a bad public image and loose reputation. Unless this problem is addressed, investment in the development of ICT in the University is a waste (Kyambogo University, 2019). As a matter of urgency, this necessitated the need for the study.

### **1.3 Purpose of the study**

The main purpose of this study was to investigate the effect of information communications technology on academic records management at Kyambogo University.

### **1.4 Specific Objectives**

The study was guided by the following specific objectives;

- i) To assess the effect of the availability of ICT Hardware on academic records management of Kyambogo University.
- ii) To examine how the Quality of ICT Software affects academic records management of Kyambogo University.
- iii) To establish the relationship between ICT human resources competence and academic records management of Kyambogo University.

## **1.5 Research questions**

The following research questions were answered in the study;

- i) What is the effect of availability of ICT Hardware on academic records management of Kyambogo University?
- ii) How does the Quality of ICT Software affect academic records management of Kyambogo University?
- iii) What is the relationship between ICT human resources competence and academic records management of Kyambogo University?

## **1.6 Hypotheses**

**H<sub>a</sub>:** There is a significant statistical relationship between ICT human resources competence and academic records management of Kyambogo University

**H<sub>o</sub>:** There is no significant statistical relationship between ICT human resources competence and academic records management of Kyambogo University

## **1.7 Significance of the study**

The study shall be relevant in the following ways:

The finding of the study may help the Ministry of Education and Sports and other interested parties to define the role ICT in Institutions of Higher Learning, the challenges surrounding its usage, strategies and remedies to such challenges in public universities.

Kyambogo University may use the report to identify areas for improvement in adoption of ICT for academic records management. In addition, the study will help the management of Kyambogo University to realize their responsibility of why, how, and when they are supposed to improve on ICT policies so as to improve on its operation and the general performance of the Institution.

Future scholars may use the report as a source of additional knowledge on ICT as a teaching tool that impacts on students learning in Higher Education Institutions since a copy will be part of Kyambogo university library stock for public use.

## **1.8 Scope of the study**

The scope of the study was segmented into three, that is to say, content, geographical and time scope.

### **1.8.1 Content scope**

The study investigated the effect of information communications technology on academic records management at Kyambogo University taking academic information management system as a case study. ICT as an independent variable was measured in terms of hardware availability, software quality and human resources competencies. On the other hand, the dependent variable which is academic records management was measured by the relative ease to access information, timely completion of tasks, operation precisions as well as task control and flexibility.

### **1.8.2 Geographical scope**

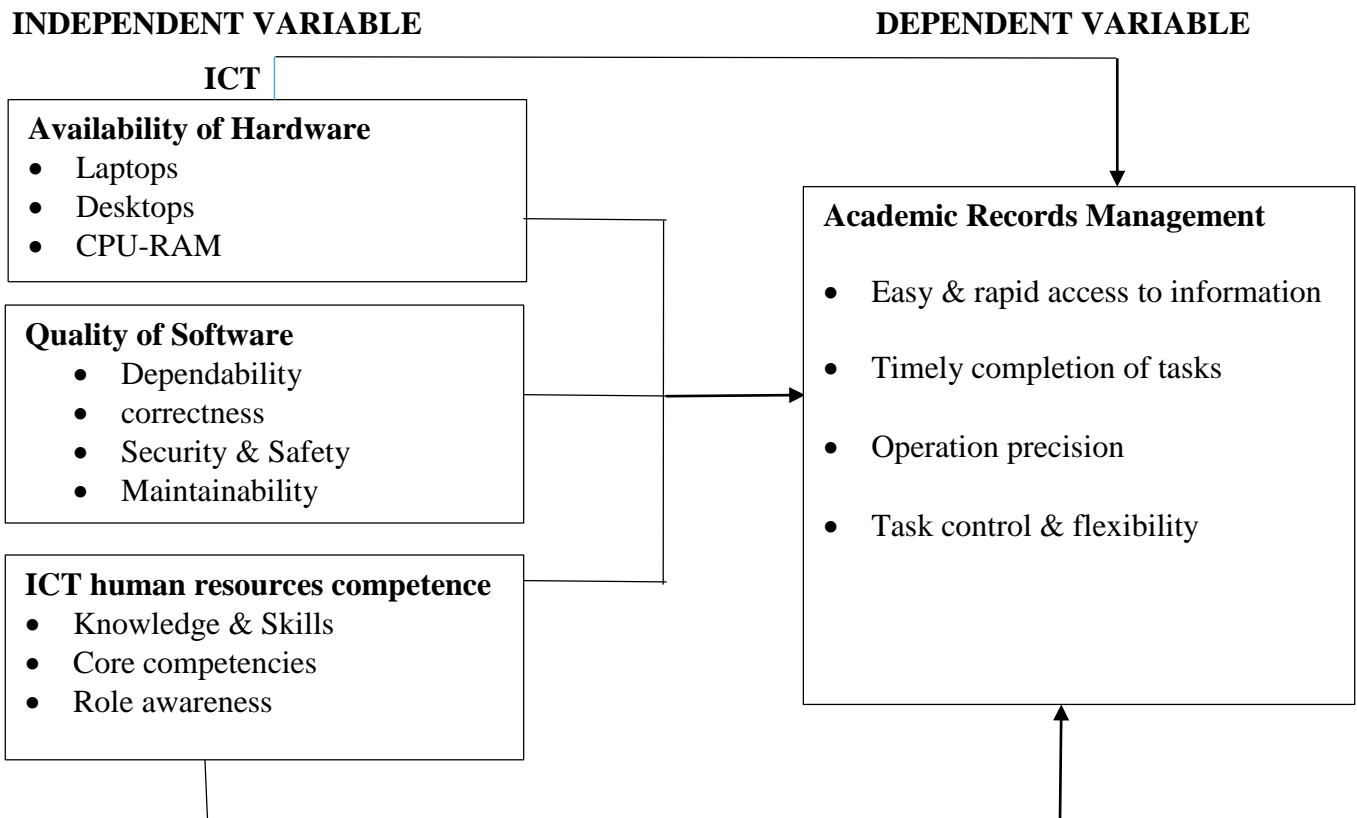
The study focused on Kyambogo University as a public University located 8 kilometers along Kampala–Jinja high way in Kampala District. The University was chosen because despite adoption of e-kampus and transformation of e-kampus to AIMS, academic records management remained appalling necessitating the need for further investigations. Above all Kyambogo University among public universities was the pioneer of ICT from which other public universities obtain benchmark.

### **1.8.3 Time scope**

The study utilised literature for the past 10years. The study problem was investigated for the past 3years while this study was conducted between January 2020 and March 2021. This period is considered because it is when KyU rolled out ICT in the management of students' academic records. This period was desirable to come to more logical conclusions and satisfactory answers to the research questions.

## **1.9 Conceptual Framework**

The conceptual framework of a study explains the system of concepts, assumptions, expectations and theories that supports and informs the research ( Suhail & Sibichan, 2014). The conceptual framework below explains the effect of information communications technology on academic records management at Kyambogo University; a case study of Academic Information Management System.



**Source:** Adapted from Toyo, D.O. (2017); Ochwo, Atibuni & Sekiwu, (2018) and modified by the researcher.

**Figure 1: Conceptual Framework**

Figure 1 above illustrates a built conceptual framework based on both the Adaptive Structuration Theory (AST) and records Life Cycle Theory (LCT) and the literature reviewed in empirical studies made by different scholars such as Toyo, (2017). The framework above indicates that ICT was the independent variable which directly affects academic records management at Kyambogo University Academic Information Management System as the dependent variable.

ICT as the independent variable was operationalized in terms of; availability of hardware quality of software and human resources competencies (Gürkut & Nat, 2018). Availability of Hardware in the study is conceptualized along dimensions of; laptops, desktops and RAM (Sulaiman, Ramayah & Omar, 2010). Quality of Software is operationalized by in terms of dependability, correctness, Security & Safety as well as Maintainability (Adomi & Kpangban, 2010). Human Resources is measured in terms of; knowledge & skills, core competencies and role awareness (Baryamureeba, 2010) ). Lastly, Academic Records Management is the dependent variable

conceptualized in terms of; Easy & rapid access to information, Timely completion of tasks, operation precision and Task control & flexibility (Kiptalam & Rodrigues, 2010).

### **1.10 Definition of key terms**

**Information Communication Technology** refers to all information and communications technology hardware and software, data and associated methodologies, infrastructure and devices that are owned, visible and invisible, controlled or operated by the an institution

**Records management** refers to the whole range of activities which an organization should perform to properly manage its records. The key activities include setting records management policy, assigning responsibilities, establishing and promulgating procedures and guidelines, as well as designing systems, implementing and administering recordkeeping systems.

**“Records Management”** includes following the management principles under: planning, directing, organizing, controlling, reviewing, training and other managerial activities involved with respect to the creation, classification and indexing, distribution, handling, use, tracking, storage, retrieval, protection and disposal of records to achieve adequate and proper documentation of government policies, decisions and transactions as well as efficient and cost-effective operation of government



## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0 Introduction**

A literature review is both a summary and explanation of the complete and current state of knowledge on a limited topic as found in academic books and journal articles. The review of literature was extensively taken from books, e-resources, internet, compendium, journals and research papers published in symposia, seminars and conferences.

This chapter presents a review of the findings from earlier studies regarding information communications technology and academic records management in institutions of higher learning. Various studies have been carried out to investigate the relationship between ICT and quality of education. These studies focused on various factors influenced by ICT; some studies evaluated the impact of ICT adoption on the performance of university education. However, very few studies have examined the effect of ICTs on academic records management. Similarly, these studies also gave mixed findings about the impact of ICT on the university students' performance. This chapter presents the theoretical review, conceptual framework and review of related literature.

#### **2.1 Theoretical Perspective**

##### **2.1.1 Adaptive Structuration Theory (AST)**

Adaptive Structuration Theory (AST) of DeSanctis and Poole, (1994) is based on Giddens' (1984) structuration theory. AST was viewed appropriate for this study because it examines the change process from two vantage points: (1) the types of structures that are provided by advanced technologies, that is, management information systems, internet and electronic databases; and (2) the structures that actually emerge in human action as people interact with these technologies (efficiency, quality, consensus, commitment and effectiveness). Proponents of AST contend that developers and users of these systems (ICT) hold high hopes for their potential to change organizations for the better, but actual changes often do not occur, or occur inconsistently (Svärd, 2014). Likewise, for the case of Kyambogo the University has invested greatly in technology to ensure widespread access to their networks, applications and productivity for proper records management process but the actual impact has not greatly been realized. It should however be noted that information plays a distinctly social, interpersonal roles in organizations (Felman & March,1981).

Perhaps for this reason, development and evaluation of technologies in supporting the exchange of information among the organizational members and its productivity is paramount. DeSanctis and Poole, (1994) add that the past decade has brought advanced information technology, which include electronic messaging systems, executive information systems, collaborative systems, group decision support systems, to mention to enable multiparty participation in organizational activities through sophisticated information management and this has seen Kyambogo university also embracing technology for management of academic records. However, many researchers believe that the effect of advanced technologies are less a function of the technologies themselves than how they are used by people (Rains & Bonito, 2017).

Scholars such as Hare, Catherine and Mcleopard (1997) further argue, that the impact of technology can only be realized when the interaction between technological tools and the human are effective. In this context of advanced technology, the actual behaviors of technology users often differ from the intended impact of the technology and consequently technology fails to yield any effect or the effect unnoticeably happens (Siegel, Dibrovsky, Kiesler and McGuire, 1986). Upon such an argument, it therefore required research to carried out to establish the actual levels of technology application and its use in academic records management at Kyambogo University.

In Adaptive Structuration Theory (AST) it is pointed out that people adapt systems to their particular work needs, or they resist them or fail to use them at all; and there are wide variances in the patterns of computer use and consequently their effects on decision making and other outcomes (Lethbridge,2003). The setup of AIMS to be used in management of students' academic records was meant to cut across all faculties/schools/institutes and all departments of the university at all levels; that is from the results coordinators to the administrators. However, it not clear whether people use technology to meet their particular needs or fail it or just resist. This is because the intended impact since its inception has not greatly been realized-for example there are delayed production of transcripts, certificate, missing results, miscalculations of Cumulative Grade Point Average (CGPA) to mention a few. Chin, Gopal, & Salisbury, (1997) reveal that technology should consist of structures (data processes and decision model) designed to overcome the human weaknesses in that once applied, ICT should bring productivity, efficiency, and satisfaction to the institution.

### **2.1.2 Records life-cycle**

The life cycle theory advanced by Schellenberg (1934) states that records can only live once at each stage in their life. This clearly defines responsibilities for the management of records at each stage (Ngoepe, 2008). Records life-cycle is the core concept in the field of records management. It is a universally acceptable among archivist and records management professionals that the cycle concept is the most integrated and comprehensive approach to records management (Lappin, 2010). Probably, that partly explains why it is popularly used as a framework for managing public sector records in eastern and southern Africa (McLeod, 2012).

The records life-cycle theory was invented by Theodore Schellenberg in 1934 while working in the National Archives of the USA (Shepherd & Yeo, 2003). According to the life-cycle records management framework, records pass through various conceptual stages during their life. For instance, Charman (1984), Hardcastle (1989), Hare and McLeod (1997), & Pennix and Coulson (1994) share the view that records pass through an active or current phase to a semi-active or semi-current state and then to a non-active or non-current stage. The evolving nature of the records life-cycle concept and the advent of information technologies made scholars visualize more stages in the life-cycle concept. Records have life cycles that are created or received. At this stage their physical form (paper, electronic, magnetic, photographic) and informational content are established. Records are then used and maintained. They are referred to, revised, refiled, and occasionally reorganized. For the most part, the need to refer to files declines sharply as their age increases.

As records reach the end of their active lives, they are disposed of in some manner: they are destroyed, reformatted, transferred to inactive storage, or transferred to the University Archives. During the use/maintenance life cycle phase, filing system design is critical in controlling records. Questions about the use and control of records should be posed and answered before a single file cabinet or folder is purchased. Will the filing system be centralized or decentralized? Will the filing arrangement be numeric, alphabetical, or a combination of both? The disposition phase of the life cycle is critically important to the legal and economical maintenance of office records (Ngoepe, 2008). Many records can be legally destroyed at the end of their active lives. Others become semi-active and should be retired to a records storage area for more convenient storage. Records with continuing long-term value are sent to the University Archives for permanent

storage. With the massive shift in Information and Communication Technology (ICT) in the 1980s and 1990s, there was proliferation in electronic records, leading to new archival and records management practices. This has resulted in debates that have challenged the relevancy of the life cycle (Ngoepe, 2008).

## **2.2 Availability of ICT hardware and academic records management**

Universities across the globe are essentially adopting ICT system such as AIMS to realize smooth operations and proper records management. Availability of ICT facilities such as word processors, electronic databases, e-mail and management information systems results in more efficient students' records management. Though ICT application entirely relies on the existence of ICT infrastructure, human resource skills and knowledge (Bogere, Faruque, Haolader, Mohammad, 2013). This study sought to establish the extent to which Kyambogo as a University avails AIMS infrastructures to users with sufficient knowledge and skills in bid to realise effective and efficient management of students' academic records.

Kayiwa, Abu and Che (2016) reveal that Information and communication technology (ICT) can be categorized into five basic types. They are sensing technologies, communication technologies, display technologies, analysis technologies and storage technologies. Sensing Technologies: these are the equipment that gather data or information and translate them into forms that can be understood by the computer. These sensing technologies include sensor, scanner, keyboard, mouse, electronic pen, touch or digital board, bar code sensor or reader, voice recognition system etc. Communication Technologies; These are equipments that enable information to be transferred from the source to user. They also try to overcome natural barriers to information transfer like speed and distance. Some of this equipment includes facsimile machine (fax), telecommunication systems, telephone, e-mail, internet, teleconferencing, electronic bulletin boards, among others.

Display Technologies: These are output devices that form the interface between sensing, communication and analyzing technologies and their users. They include computer screen, visual display unit (VDU) or monitor printer, television etc. Analysis Technologies: these are technologies that help in the investigation or querying of data, analysis, in-depth query for answers from simple to complex phenomena in research procedures. Storage Technologies: These technologies facilities that efficient and effective storage of information in a form that can be easily

accessed. They include magnetic tapes, hard disks, CD Roms, optical disks, cassettes, etc (Mulauzi, Wamundila, Naomy & Hamooya, 2019). The study sought to assess the levels of availability of these ICT hardware and deployment in the management of students' academic records in Kyambogo University.

Some of the ICT facilities are found in the National Universities Commission recommendations guideline (2008) include; computers, telecommunication, CDRom, DVD or USB Sticks and e-book. These are suitable for students' record management. Lubanga, Chawinga, Majawa and Kapondera (2018) add that computers are programmable electronic devices that possess a processor, memory and input/output facilities. This study was intended to find out how many of these ICT components are used in KyU student's records management system.

Toyo (2017) noted that information and communication technology (ICTs) are used to describe a wide range of new technologies and their applications such as telephone, internet, world wide web (www) and email which can be used to store records and process information. This study sought to determine the extent to which KyU uses telecommunication as another indispensable resource of ICT/AIMS component in the management of students' academic records.

Gürkut and Muesser (2017) identified different forms of ICTs facilities and hardware that are used to ensure proper students' academic records management. They include the following: Websites: A Website is a collation of related web documents that a web server makes available to the public. Typically, a website contains an index page or home page that displayed automatically when a user enters the site at its top level. E-mail: This simply means electronic mail. It is accessed via the internet and it provides an instant way to send or receive correspondence. Compact Disk: Read-only memory (CD-ROM): CD-Rom is an optical-disk format that is used to hold prerecorded text, graphics and sound. Like music CDs, CD-Rom is a read and only disk. Read only means that the manufacturer cannot be written to or erased by the user. CD-ROM disk can hold up to 650 megabytes of data, equal to 300, 000 pages of text (Kiptalam & Rodrigues, 2010).

Internet access is one of the most important ICT facilities. According to Ngene and Ekemezie (2004), the world internet is derived from international network, which has the largest computer network in the world. Internet services are usually on the airwaves and can only be downloaded

by a local carrier or internet service provider. The internet contains information on virtually everything and there is abundance of knowledge available on the internet (Kalusopa & Ngulube, 2012). This study sought to examine the degree of availability of internet at KyU in ensuring proper management of students' academic records.

The Universities, at all levels; that is, colleges, schools, faculties, departments, individual offices and above all affiliated institutions need to have atleast computers availed and connected to the internet to provide information creation, storage, transmission, retrieval and disposal of students' academic records (Eze, 2013). The availability of ICT equipment's such as computers should be provided by the directorate of ICT individually to serve particular records needs of every user in the university (Nasieku, 2011). However, it was not clear how KyU provides ICT equipments to specific users whose level of applicability in facilitating students' academic records management requires investigation

Saaka, (2011) observed that staff today find it easy to pick up any available ICT tools and learn easily how to communicate with it. However, this study sought to find out the adequacy of ICT devices. Asankha and Yamano (2011) reveal that availability of ICT equipments aids uploading of students' academic records on the University website with a fully functional MIS. This is where users would find it easier to access student's database to curb the frequent flocking in of employers, students in different offices in search of student's examination results and tracing for missing marks every semester.

Available ICT infrastructures facilitates recording of student's data electronically, storing it centrally, sharing it with colleagues and reducing workloads. Many university offices, need to have functional ICT facilities to create impact on the management of students' academic records (Asankha & Yamano, 2011). This study was intended to assess how availability of ICT hardware enables KyU to increase efficiency and accountability in the management of students' records.

Clarke-okah, Ferreira and Kwan (2009) noted that adoption of AIMS with efficient availability of ICT equipments such as desktop computers, laptops, internet access facilitates reduction of rampant missing results. Development of an efficient records management system requires presence of fully efficient ICT or AIMS system. This can help universities to manage student

numbers within the data base. This study sought to examine the utilization of available ICT components in curbing or eliminating mismanagement of students' academic records.

Guma, Haolader and Khushi (2013) point out that in respect to management of students' records, various types of ICT tools should be made available in making informed decisions at all levels and in improving efficiency of operations, such as executive decision-making management information system, collaborative information systems, electronic messaging systems, group decision support system. These would enable multiparty participation in the University activities through sophisticated information management (Kokt & Koelane,2013). For this case KyU developed AIMS to mainly handle students' academic records, so this called for further research to establish at what levels are such ICTs applied in supporting University activities.

The issue of transcripts, which determines the ability of students to get job opportunities, the many academic registrars' departments in most universities experience trouble. After graduation, many students search for employment but their dreams often get shattered (Krishnaveni & Meenakumari, 2010). This is the purpose, for which ICTS specifically AIMS was designed to handle. However, this study was intended to establish why such deficiencies have remained eminent at KyU.

The availability of ICTs enhances full and effective speed in processing students' documents such as testimonials, recommendations, transcripts with relative ease. In addition, students' marks for assessed examinations can be recorded within the virtual learning environment (VLE). Assessment marks can be recorded at the module level and automatically transferred to departmental or institutional level without rekeying (Saud, Babawuro, Lokman, Buntat & Noraffandy, 2011). Institutions that provide well-integrated facilities for providing online information about programs, modules and assessed results in which VLEs for individual modules are embedded can be said to provide a Managed Learning Environment (MLE) (JISC, 2001). It remained unclear how KyU manages students' examinations results using its well-integrated AIMS system, which study aims to investigate.

### **2.3 The Quality of ICT Software and academic records management**

University management tend to use various software applications in administration of students' academic records. The most frequently used software applications in public universities are Office

tools such as; Microsoft Office (Word, Excel, access and PowerPoint), among others (Mwalongo, 2011 & Kawade, 2012).

As Unachukwu and Nwankwo, (2012) noted, university administrators are familiar with range of softwares that handle information, particularly spread sheets and databases. Although this will be time -consuming, databases potentially offer much more efficient and effective ways to manage information that most institutions currently use. There are a lot more software applications that have been used by universities for example, the most famous application “Education Management Information System”, is a sub-system of an education system whose aim is to collect, store, process, analyse and disseminate information (Adeyemi, 2011).

Academic Institutions avoid being vulnerable to poor quality ICT systems by formulating and adhering to basic ICT policies, which among things address security anxieties. Such institutions make use of various Encryption System. Encrypting such files helps to provide security measures, digital rights management systems which is meant to prevent unauthorised use (Akpan, 2014).

Gürkut and Muesser (2017) revealed that the quality of software for academic information systems should have access control systems to control access to information and computer systems. This defines a set of account management standards that restrict access to un authorised personnel and safeguard the students’ academic information. This is done mostly by use of passwords and secret codes.

Lubaale (2015) stated that the other existing protection methods for ensuring quality of software usability is the Active Content Monitoring but the most frequent is the Antivirus, use of interior and exterior firewall and central backup servers. There is, however a limited number of Institutions protecting themselves to this level, the main reason is the costs involved. Most of the software protection available involves regular and consistent renewal of licenses and subscriptions, and these costs are considered by many (Nelly, 2015).

Lubaale (2012) says that the quality of an academic information system software should be purposely secure and safe to protect an entity’s valuable resources. Through the selection and



application of suitable safeguards, security and safety helps to achieve the organisation's mission by protecting tangible and intangible assets.

Asogwa, Muhammed, Ahmed and Danmaitaba, (2015) note that, security is sometimes viewed as thwarting the mission of the organisation by imposing poorly selected, bothersome rules and procedures on users, managers and systems. On the contrary, well-chosen security rules and procedures do not exist for their own sake, they are put in place to protect important assets and thereby support the overall organisational mission (National Information Security Strategy, 2014). Despite of the increase in the use of ICTs, there has been little done to help the Ugandan Institutions in improving their ICT security in both business and Higher Institutions of learning which this study intended to fulfil.

The research by Karsenti, Thierry and Mbangwana, Moses & Harper-Merrett, Toby, (2009) confirms that the cost of internet connection and maintenance is a great challenge affecting students' academic records management institutions are facing.

Eze (2013) revealed in his work that many kinds of software are available in the world of computers and internet which will help in making the task of school management to become easy. In support of the above Saiti and Prokopiadou (2009) reported that the school management software is a computerized application and programme which helps in effective and controlling the running of the operations of an institution, such as storing, controlling and centralizing all the activities. This software can equally be used in keeping record of all the data and events in the university which can be retrieved when needed. To support the above Suhail & Sibichan (2014) highlighted that there are many benefits accrue from the use of these software in administration or management of annual student data is organized in a simple and accessible format, which this study sought to find out.

Many Universities have lost sums of money, student's records, physical computer equipment in incidents of ICT insecurity but majority have remained silent with poor quality and undependable ICT softwares because of fear to loose market and integrity (Bogere, Faruque & Mohammad, 2013).

Bharamagoudar, Geeta and Totad, (2013) reveal that, the quality of software for better management of students' academic information must be secure and safe in terms of providing; Confidentiality, Integrity, and Availability (CIA). Chawinga and Zozie, (2016) adds that the concept of CIA was developed in the era of computing, when Electronic Data Processing (EDP) operations were representative of most computing environments, and information security was basically a technical function.

Fardzah, Ramayah and Azizah (2010) says that Information and Communication Technology (ICT) is an important strategic and essential functional requirement for students' academic records management. In the developing world, the use of AIMS is achieving breakthrough in management of students' academic records. This aids to cater for the increasing student enrollment. However, the security of the students' academic records processed, stored and exchanged is a growing disquiet to the management as the dependence on AIMS as an ICT system for most of the institutions' core services functions. Thus, the need for further investigation.

Bogere et. al, (2013) mention that ICT security architecture for the Higher Education sector must meet the following overall quality requirements: adequate protection, established security and risk assessments levels, compliance with the institution's information security policy and other national and international regulatory requirements and agreements with third parties, must be equipped with appropriate capacity and adequate robustness in the event of failure (resilience).

The ICT systems must have adequate quality. Various scholars such as Mutula, (2010) reveal that a good information security policy is the foundation of organisations' software quality. However, little research has been made into the creation of good security policies in many Institutions of higher learning but varieties of beliefs with respect to security policy exist.

Igweonu (2013) states that there are two schools of thought in existence that distinguish dealing with ICT information systems quality that is the Technical Security Management Control and the Non-Technical Security Management Control. Technical Controls section focuses on security controls that the computer system executes which depend on the proper functioning of the system for their effectiveness. The implementation of technical controls however always requires

significant operational considerations and should be consistent with the management of security within the organization (Maere, 2011).

On the other hand Lyman, (2014) note that the Non-technical Management Controls are techniques and concerns that are normally addressed by management in the organisation's computer security program. Generally, they focus on the management of the computer security program and the management of risk within the organisation.

The right or correct AIMS software focuses on affordability and access to cyber security management and critical Internet resources. On cyber security management, institutions need to operationalise cyber laws, including the Computer Misuse Act (2010), Electronic transactions Act (2011) and the Electronic Signatures Act, (2011). Despite the availability of the law, institutions may not know how the cyber law operates and also none of the victims is ready to go public for fear of raining their integrity in business and on addition majority lack skills of protecting themselves against the criminals (Bogere et. al, 2013). Thus, this needed further research into the effect of the quality of AIMS on the management of students' academic records.

Quigley (2011) note that, protection of ICT software quality is a major challenge since the inception of the computer age. Computer files, databases, networking and the Internet based applications all have gradually become part of the most critical assets than before. When these assets are attacked, damaged or threatened, data integrity becomes an issue and the proper operation of the business may be interrupted (Uganda Communications Commission paper on the state of cyber security in Uganda, 2005).

Wamukoya (2012) asserts that the purpose of information security is to protect an organisation's valuable ICT software. Through the selection and application of appropriate safeguards, security helps the organisation's mission by protecting its physical and financial resources, reputation, legal position, employees, and other tangible and intangible assets. Unfortunately, security is sometimes viewed as thwarting the mission of the organisation by imposing poorly selected, bothersome rules and procedures on users, managers, and systems. On the contrary, well-chosen security rules and procedures do not exist for their own sake, they are put in place to protect important assets and thereby support the overall organisational mission.

In case the university uses the server to keep their examination online there can be possibilities that the students can hack into the system and leak exams, so on the opinion about “The University students leak exams because of weak network security controls” Universities should implement an advanced ICT security based on the research by Nora and Ndiwalana (2009/2010) where he said that the purpose of information security is to protect an organization’s valuable resources, such as software. Through the selection and application of appropriate safeguards, security helps the organization’s mission by protecting its physical students’ academic records and other tangible and intangible assets.

Gürkut and Nat (2016) Majority of the students were in disagreement about the issue of University Students leaking exams because of weak network security controls, however there can be possibilities of leaking exams when examination are kept on the computer which is online, students can hack through the network and have access to such examinations, therefore all Universities are advised always to keep their examinations on computers that are offline for security purposes. Majority of the respondents agreed with the statement that a weak network security leads to low academic activities in the Universities (Wamukoya, 2012). This is because there would be less research conducted, the loss of study materials, computers could not work because they are infected with viruses, and hence leads to low academic activities.

#### **2.4 ICT human resource competencies and academic records management**

Abuga (2014) indicate that several challenges face human resources involved in records capturing, processing, storing, retrieval, preservation and disposal: absence of organisational plans for managing records; low awareness of the role of records management in support of organisational efficiency and accountability; lack of stewardship and coordination in handling records; absence of core competencies in records and archives management; absence of budgets dedicated for records management; lack of records retention and disposal policies; and absence of migration strategies for records.

Human resources involved in the management of students’ academic records using ICT systems need to re-visit their roles. In most public universities, human resources need ICT records requisite skills to effectively and efficiently manage students’ academic information (Opara, & Onyije,

2014). Effective e-records this may potentially improve service delivery, enhance accountability and transparency in public institutions of higher learning.

Akpan (2014) highlight a number of competencies and skills that ICT human resources ought to have in the management of students' academic records. These skills and core competencies are diverse but can be categorized at various levels including: records and information management skills, technology skills, managerial skills, and project management skills. Other e-records management skills need include but are not limited to: skills to create, capture, classify, index, store, retrieve, track, appraise, preserve, archive and dispose of records in an electronic environment. These need to be complemented by knowledge of electronic records environment; knowledge of e-records management practices and trends; knowledge of the types of electronic records including web pages; and knowledge of IT applications to records and archives management.

Baryamureeba (2010) noted that with the emerging roles of universities to fulfil the evolving global needs as well as the technological advancements, numerous implications in managing students' academic records need fulfilling. For example, there is need not only to employ more ICTs but also personnel who can manage students' academic and electronic records effectively. The need for competent and skilled electronic records managers is a necessity by the fact that institutions of higher learning, just like other organisations, become digitalised.

Using AIMS as an ICT digital system embraces not only the availability of ICT infrastructure but also the availability of academic records managers in form of human resources able to manage students' information electronically (Bantin, 2008).

Human resource officers involved in the management of students' electronic records can only ignore it at their own jeopardy. Nevertheless, what needs to be done is to understand the implications of these technologies and what it entails in the fulfilment of the university's vision (Bassey, Okodoko, & Akpanumoh, 2009).

In the same approach, there was need for the university ICT staff to change to fit into the changed work environment to survive this new technological wave we have. To do this, they must understand the new technology and find ways and means of embracing it. Consequently, records

managers need a change in the techniques of managing students' academic records. staff involved in AIMS need to review the whole concept of the records cycle and the attendant processes and procedures used to manage the records. Thus, they need to review their techniques of handling records from creation to disposal and also redefine their role in this changed ICT environment (Anwar & Matthew, 2014).

Human resources involved in AIMS require core skills and competencies to build sound academic records management strategies and have the ability to tactfully develop interventions of promoting desirable academic records keeping as tools that will enhance good governance in public universities (Chifwepa, 2013). Therefore, there was need to conduct a study to ascertain the extent to which academic records management is affected by inadequate capacity and skill gaps.

The onset of students' academic records has resulted in the creation of two systems of records in institutions of higher learning: those that are electronically-based and; the paper records. Hence human resources involved in AIMS have to ensure that the two systems do not operate in isolation. Academic records staff must have the skills to work out strategies of harmonizing the two systems into an effective information delivery (Onifade, 2012).

In other words, academic records officers should ensure that paper and electronic records co-exist for some foreseeable future. They have to play this new dual role amicably. Further, the various subsystems within the management of students' academic records need to be coordinated to ensure that they work as a unit in the provision and management of academic information resources. They should not work in isolation of the other subsystems In as far as managing active students' academic records is concerned, Popoola, (2009) suggest two basic options: either print the electronic records and manage them like other traditional records, or use software applications to manage them in electronic format. However, some e-records such as hybrid documents or databases with disparate information sources tend to be difficult to print. Additionally, some paper copies tend to lose some of their features for example in distributed access. Nevertheless, the advantage is that it is cheaper and easier. If an organisation decides to manage active records in electronic format, there will be need to use special software applications for instance, Electronic Document Management System (EDMS) and Electronic Records Management System (ERMS).

However, these are very expensive and they need upgrading (newer versions) and face the same risks as the electronic records themselves (Tusubira & Mulira, 2012).

To manage inactive student academic records, staff involved in AIMS can either employ distributed Custody or centralize custody approaches. Distributed approach is where each institution is given the responsibility to manage their own e-records. The advantage with this approach is that the entity will possess the IT infrastructure to manage the items and the National Archival unit is not required to acquire Hardware/Software to support this (Wamukoya, 2012).

Centralized Custody is where each organisation is required to transfer electronic records to the National Archival unit in accordance with the agency's records disposition schedule. The advantage is that the archival material is under control and management of National Archival unit. In fact, supporters of the centralized custody model argue that the authenticity over time of inactive records can be ensured only when their custody is entrusted to professional archivists. More specifically, proponents of this position according to Bantin (2008) identify five reasons inactive records should be transferred to an archival repository and not left in the custody of the record creators: 1. Mission - Competencies: It is not part of the mission of the creating agency, nor do their staffs possess the necessary skills to safeguard the authenticity of non-current, archival records. 2. Ability to Monitor Compliance: There are not enough trained archivists available to monitor or audit records in a distributed custody environment. 3. Cost to Monitor Compliance: Costs to manage records in a distributed environment are as yet unknown and untested, but it may likely be more costly to monitor recordkeeping practices than to assume custody of the records 4. Changes in Work Environment: Changes in staffing and in departmental priorities can place records left with creating offices at great risk. 5. Vested Interests: Inactive records must be taken from those who have a vested interest in either corrupting or in neglecting the records (Wamukoya, 2012).

However, Gürkut and Nat (2016) argue that the primary issue may not be custody, but rather ensuring that a viable and widely accepted system for managing electronic records is in place. This means establishing policies and procedures that ensure that no matter where the records are housed, they will be managed according to well-established standards.

More specifically, Bantin (2008) point out that a distributed strategy for custody necessitates the creation of legally binding agreements with offices, of reliable means of auditing records, of an extensive network of training programs, and of other mechanisms designed to ensure that custodians of records understand their responsibilities and are living up to those expectations. Katuu (2015) further established that to preserve and provide access to 'authentic' electronic records in the long term, various strategies can also be used to deal with this including: (1) Emulation: This is where hardware and software facilities are specially equipped to imitate older or obsolete hardware and software (2) Migration: This involves the periodic transfer of digital materials from one hardware/software configuration to another or from one generation of computer technology to a subsequent generation. In all these, according to Katuu, various activities may be undertaken including: Transfer records to paper or microfilm, transfer to software independent formats, retain records in their native format, Migration of records to a system that is compliant to open systems standard, Store records in more than one format and Create surrogates for the original records.

In a nutshell, the above literature human resource officers in charge of management of students' academic records using AIMS in Universities need to have the potential to be competent professionals in managing records. However, they need to consider adopting contemporary records management practices in order to effectively manage organisational records in various forms. In addition, for records officers to effectively engage in students' academic e-records issues, a number of changes such as change in skills sets, mind sets and professional cultures need to be affected. Effective management of e-records will ensure that there is a reduction of information gaps, preservation of valuable information for posterity, easy information retrieval and accessibility in the digital age.



## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.0 Introduction**

This chapter presents and describes the methodology that was used to collect and analyse data obtained from the field. It covers the research design, study population, sample size and selection, sampling techniques, data collection methods, Data collection instruments, procedure of data collection, reliability and validity of instruments, Measurement of variables, data presentation and analysis, ethical considerations and the limitations to the study.

#### **3.1 Research Design**

The study adopted a cross-sectional research design with specific reference to Kyambogo University's Academic Information Management System as a unit of analysis. This design was considered appropriate for the study due to the fact that it was used to gather data from a sample of a population at a particular time in order to obtain information about preferences, attitudes, practices, concerns or interests of a group of people (ICT staff and academic records managers) (Kothari, 2010; Leedy & Ormrod, 2010). Both qualitative and quantitative techniques were used for the mutual validation of findings for the production of more coherent and complete picture of the investigation domain than a one method research could yield (Udo, 2006 & Creswell, 2014). The basic premise of mixed methodology is that such integration permits a more complete and synergistic utilization of data than do separate quantitative and qualitative data collection and analysis. Combining both qualitative and quantitative techniques helped to deliver significant benefits by enabling comparison and contrast results to gain much deeper insights (Creswell, 2014).

#### **3.2 Target Population**

The target population of staff using AIMS to manage students' academic records was four hundred and twenty (420) respondents. This was arrived at by conducting a pre-study with the directorate of ICT staffing and human resource staffing structure to ascertain the target population. This comprised of 30 ICT staff, 50 Academic Registrars Department, 239 results coordinators, 30 Heads of Departments, 10 Deans of Faculties and 60 Administrative assistants.

### 3.3 Sample Size and Sampling Technique

#### 3.3.1 Sample size

The ultimate sample size was derived using Bartlett, Kotrlik and Higgins (2001) recommended formula below,

$$n = \frac{z^2 pq}{e^2} \quad \text{where}$$

$z = 1.96$  at 95% confidence level

$Z$  is the value corresponding to level of confidence required for accuracy of the survey findings

The key idea behind this is that if a population were to be sampled repeatedly the average value of a variable or question obtained would be equal to the true population value. In management research the typical levels of confidence used are 95 percent (0.05: a  $Z$  value equal to 1.96) or 99 percent (0.01:  $Z=2.57$ ).

$e$  is the percentage maximum error required.  $E$  is the margin of error (the level of precision) or the risk the researcher was willing to accept. In the social research a 5% margin of error is acceptable.

**Is 5%**

$P$  is the percentage occurrence of a state or condition/ heterogeneity of the population ( $P$ ) **at 50%**  
**= 0.5** whereas;  $q = 1-p, = 1-0.5 = 0.5$

$$n = \frac{z^2 pq}{e^2} = \frac{1.96^2 * 0.5 * 0.5}{0.05^2} = 384$$

Sampling Size of the respondents was 384 respondents.

#### 3.3.2 Sampling Technique

According to Taherdoost (2016) Sampling is a strategy which the researcher uses to select representative respondents from the target population. Three sampling techniques were used to select the sample size of the study. Academic Registrars Department was selected using purposive sampling technique. In using purposive sampling technique, sampling units were selected according to the specific purpose to provide biased estimate (Saunders, Lewis & Thornhill, 2012). The purpose of using purposive sampling technique was to access confidential information relating to students' academic records management. This technique was used since the members had rich and deeper information and yet they were the center of ensuring proper input, storage, access/retrieval as well as destruction.

Simple random sampling was used in selecting Heads of Departments, Deans of Faculties and Administrative assistants. In the simple random sampling method, each unit included in the sample had equal chance of inclusion in the sample. This was used because the technique provides the unbiased and better estimate of the parameters for the homogeneous population (Saunders, et.al. 2012).

ICT staff in the directorate was selected using stratified sampling technique to form strata. This technique was used to make sample selection without any prejudice and to enable every employee in the directorate to have the same chance to be part of the study. In stratified random sampling method, the entire heterogeneous population is divided into a number of homogeneous groups, usually known as Strata, each of these groups is homogeneous within itself, and then units are sampled at random from each of these strata. Strata or Subgroup were chosen because evidence was available that they were related to outcome. ICT staff also perform different tasks in enabling proper system functioning and data reliability and security (Saunders, *et.al.*, 2012).

### **3.4 Sources of Data**

#### **3.4.1 Primary data**

The researcher solicited raw data by asking the respondents questions to fill in the questionnaires. Primary data was got directly by visiting Kyambogo University and information was obtained from respondents.

#### **3.4.2 Secondary data**

The researcher obtained Secondary data from libraries, reading text books, journals, reports publications going to the internet and review of the documents published by the units of analysis.

### **3.5 Data Collection Procedures**

The researcher obtained an introduction letter from Graduate School of Kyambogo University introducing herself to Human resource department, ICT directorate and academic registrar's department, who then introduced her to specific individual staff members to guide her obtain information from various departments of respondents in different sections. The researcher was organize a period of two weeks within which data was collected (Creswell, 2013).

### **3.5.0 Data Collection Methods**

Data collection methods that shall be used will include; questionnaire survey for quantitative data whereas interviewing and documentary review for qualitative data as explained below:

#### **3.5.1 Questionnaire Survey**

The researcher used the questionnaire survey because it was practical, large amounts of information was collected from a large number of people in a short period of time and in a relatively cost-effective way. Numerical or statistical data was obtained using this method. The results of the questionnaires could usually be quickly and easily quantified by either a researcher or through the use of a software package and could be analyzed more ‘scientifically’ and objectively than other forms of research. A questionnaire was used because it was cheap, it also allows in-depth research, to gain firsthand information (Bryman, 2016).

#### **3.5.2 Interviewing**

An interview is a conversation between two or more people where questions were asked by the interviewer to obtain facts or statements from the interviewee. Interviews were used because they had the advantage of ensuring probing for more information, clarification and capturing facial expression of the interviewees (Babbie, 2010). Personal or face to face interviews were conducted with a selected few of the total number of respondents. Interview aided to collect descriptive data or qualitative data to complement data obtained using questionnaires.

#### **3.5.3 Documentary Review**

In the secondary analysis of qualitative data, good documentation could not be underestimated as it provided necessary background and much needed context both of which made re-use a more worthwhile and systematic endeavor (Kothari, 2010). Secondary data was obtained through the use of published and unpublished documents (Jonker & Pennink, 2010). Documents such as Kyu ICT policy, University Strategic Plan, Records Management Manual, Uganda’s Electronic transaction Act (2011), students’ academic records were reviewed.

### **3.6.0 Research Tools/Instruments**

The data collection methods that used included self-administered questionnaires, interview guide.

### **3.6.1 Questionnaires**

The researcher used close ended questionnaires (appendix 1) for all Administrative assistants and faculty registrars. The use of questionnaires enabled the researcher to collect sensitive data without fear as their personal identity was not required. This is supported by Amin (2005) who argues that questionnaires offer greater assurance of anonymity thus enabling respondents to give sensitive information without fear. Mugenda and Mugenda (2009) stated that questionnaires were used to obtain vital information about the population and ensure a wide coverage of the population in a short time. In addition, Sekaran & Bougie (2010) states that questionnaires are efficient data collection mechanisms where the researcher knows exactly what is required and how to measure the variables of interest. They were also less expensive, time saving and they did not need much skills to administer them.

Rensis Likert's scale statement having five category response continuums of 5-1 were used, strongly disagree (1), Disagree (2), Not sure (3), Agree (4), Strongly agree (5) with assertion. In using this each respondent selected a response most suitable to him/her in describing each statement and the response categories were weighed from 5-1 and average for all items were computed accordingly.

### **3.6.2 Interview guide**

The interview guide (Appendix: II) was used to collect qualitative data that could not be collected by the use of questionnaires. The use of interview guide helped the researcher generate more information with greater in depth on the various questions that were asked. Interviews allowed face to face interaction with respondents. Interviews were used because they had the advantage of probing for more information, clarification and capturing facial expression of the interviewees (Drury Homewood, & Randall, 2011). The interview guide was used to complement data obtained using questionnaires to meet the study objectives.

### **3.6.3 Documentary Review Checklist**

The documentary review check-list was used for purposes of reviewing documentary data. Documentary data was obtained through the use of published and unpublished documents. According to Amin (2005) documents could be helpful in the research design of subsequent primary research and could provide a baseline with which the collected primary data results were compared to other methods.

### 3.7.1 Validity and Reliability of Instruments

Validity refers to the truthfulness of findings or the extent to which the instrument is relevant in measuring what it is supposed to measure (Creswell, 2014). Research tools were first prepared, presented to the supervisors who checked on their correctness. The supervisors' comments were used to improve the questionnaire by eliminating all errors. Pretesting of questionnaires also was done by administering questionnaires to 10 respondents from Makerere University. This helped to identify the gaps and make modifications accordingly.

The researcher used the formula below to establish validity of the research tool;

$$\text{Content Validity Index (CVI)} = \frac{\text{Number of items rated relevant}(a)}{\text{Total number of items in the tool}(b)} = \frac{41}{52} = 0.7885$$

The overall content validity of the instrument was 0.7885 which was above the acceptable index of 0.7 as recommended by Thomas & Magilvy (2011). Therefore, the instrument was accepted as valid for administration in the field.

The validity of the qualitative data was addressed in terms of trustworthiness, authenticity, and credibility as recommended by Creswell (2009) as well as Abdullah and Siti (2019). The researcher used triangulation of different data obtained from both secondary and primary sources to ensure validity by checking the data from different sources against each other. The researcher used rich and thick descriptions to convey the detailed meaning of the study findings to the readers, making it possible for the readers to understand and replicate the study. The researcher also spent extended time with respondents in order to develop an in-depth understanding of the phenomenon under study and to convey detailed credibility to the study narrations. The researcher was able to gain more experience with respondents in their settings. This helped to obtain more accurate and valid findings.

### 3.7.2 Reliability

Reliability is the measure of the degree to which a research instrument yields consistent results after repeat. Qualitatively, the reliability of the instruments were established through a pilot test of the questionnaire to ensure consistency and dependability and its ability to tap data that answered the objectives of the study. Cronbach's Alpha coefficient were used to measure reliability of the instrument. According to Amin (2005) an alpha of 0.7 or higher is sufficient to show reliability the closer it is to the higher the internal consistency in reliability (Sekaran & Bougie, 2010). The

questionnaire was pretested using respondents from Makerere University results coordinators who upload results in AIMS and reliability was computed using Statistical Package for Social Sciences (SPSS Version 21) and scores were evaluated.

In order to ensure reliability of qualitative data, the researcher adhered to the qualitative reliability procedures described by Gibbs (2007). The researcher checked questions and interview records to ensure that they do not contain obvious mistakes made while in the field. The definition of codes was reviewed during coding process to accomplish data comparison with codes. The researcher regularly coordinated with academic records managers and ICT staff to share the analysis with them regarding their effectiveness.

### **3.8.0 Data Sources**

Data sources included primary and secondary data sources.

#### **3.8.1 Primary data Collection**

Primary data was obtained by use of survey questionnaires and interviewing.

#### **3.8.2 Secondary Data**

This is any published work that is one step moved from the original source and this was obtained from documents from Kyambogo University. The study also involved carrying out library and office research where secondary sources about the research questions were considered. These included ICT policy, AIMS reports, newspapers and KyU strategic plan. Document analysis of the various documents covering the study period and analysis of departmental reports on the AIMS performance at KyU.

### **3.9 Data Processing**

Data collected was edited manually, coded, tabulated and processed using Statistical Package for Social Science. Coding involved transcribing the data from the questionnaire to a coding sheet which then was pressed into computer. Editing was done to ensure data accuracy, consistency and was uniformly entered and arranged to facilitate coding and tabulation. With tabulation, data was arranged in columns and rows to facilitate statistical computations. Tabulation involved mainly the use of statistical techniques such as tables, frequencies, percentages, means and standard deviations which tested the significance of the information from which inferential statistics were drawn (Creswell, Vicki & Plano,2017).

### **3.10.0 Data Presentation and Analysis**

This involved the analysis of both the quantitative and qualitative data.

#### **3.10.1 Quantitative Data Analysis**

After data collection, researcher inspected the survey data for missing, incomplete, or unusual information. In the event of missing or erroneous data, researcher employed data cleaning which was important in statistical analyses, especially in regression analysis. Quantitative data was analysed using multiple regression. Multiple regression is the appropriate method of statistical analysis when one dependent variable and three predictor variables were examined (Saunders, Lewis & Thornhill, 2012). Therefore, multiple regression was the appropriate data analysis method for the study for which analysis of variance (ANOVA) was used. However linear regression analysis was used for each objective to predict the effect of one independent variable on the dependent variable (Bedford & Malmi, 2016). An ANOVA is appropriate when the criterion variable is quantitative and continuous, but predictor variables are categorical (Cohen, Manion, & Morrison, 2011). Multi-collinearity exists when two or more predictor variables linearly correlate, indicating the lack of independence between variables. The most common test for multicollinearity is a check for a high  $R^2$  value where  $p < .05$  is as an acceptable level of statistical significance (Luft & Shields, 2014).

Results were interviews interpreted using descriptive statistics to interpret the inferential statistics of the regression analysis such as measures of central tendency like mean and standard deviation and variability of variables (Robson, 2011).

#### **3.10.2 Qualitative data analysis**

The information obtained was sorted and grouped into sub-themes in line with the study objectives (Vaismoradi, Bondas, Turunen, 2013). Qualitative data was used to complement quantitative data obtained using questionnaires (Cohen, et.al., 2011). The reasons for performing a qualitative data analysis were to explore the challenges staff experience in handling ICT and students' academic records. And above all the academic records management statistics could only be explained qualitatively to give a clear understanding and meaning of the study results (Schreier, 2012; Maxwell, 2013).



### **3.11.0 Measurement of variables**

The variables were measured using the five Likert scale. Different variables were measured at different levels. The Nominal Scale was assigned to different variables to serve as its value in order to create a difference or similarity. The independent variable in this study was ICT and was measured by availability of ICT hardware, quality of software and human resources. The dependent variable was academic records management and this was measured by easy & rapid access to information, timely completion of tasks, operation precision and task control & flexibility (Kothari, 2010).

### **3.12.0 Ethical considerations**

The researcher considered the research values of voluntary participation, anonymity and protection of respondents from any possible harm that could have arisen from participating in the study. Thus, the researcher introduced the purpose of the study as a fulfilment of a Masters' study program and not for any other hidden agenda by the researcher. The researcher requested respondents to participate in the study on a voluntary basis and refusal or abstaining from participating was permitted. The researcher also assured the respondents confidentiality of the information given and protection from any possible harm that could arise from the study since the findings were to be used for the intended purpose only (Moore, 2016).

The researcher upheld use of pseudo names to maintain confidentiality of key informants. The use of A, B, C, D and E for directorate of ICT staff, AR<sub>1</sub>, AR<sub>2</sub>, AR<sub>3</sub>,..., AR<sub>6</sub> were used for academic registrars departmental staff, RC<sub>1</sub>, RC<sub>2</sub>,..., RC<sub>12</sub> were used in presentation of interview results from results coordinators; for heads of departments, HoD<sub>1</sub>, HoD<sub>2</sub>,...,HoD<sub>10</sub> were used while D<sub>1</sub>, D<sub>2</sub>...D<sub>6</sub> were pseudo names used in present interview results from deans of schools and faculties .

### **3.13.0 Limitations of the study**

#### **3.13.1 Information**

Some respondents were not willing to give complete information as they looked at research as a threat to the institutional status and wastage of their time. The study tools were made to avoid misleading questions.

### **3.13.2 Area of study**

The boundaries within which the researcher conducted the study were wide in such a way that, narrowing down the study to suit the researcher's ability was not easy. The researcher however, used an appropriate sampling technique convenient for the research by choosing one public university out of the 11 public universities using AIMS in Uganda and later generalize the findings.

**CHAPTER FOUR**  
**PRESENTATION, ANALYSIS AND INTERPRETATION OF FINDINGS**

**4.0 Introduction**

This chapter enlightens on the presentation, analysis, and interpretation of findings. The purpose of the study was to investigate the effect of information communications technology on academic records management at Kyambogo University. It presents the response rate, demographic characteristics, descriptive statistics on the key study variables, correlation analysis, and the regression analysis.

**4.1 Response rate**

The researcher administered 238 questionnaires for data collection and 209 questionnaires were filled and returned for consideration. The returned questionnaires represented a response rate of 87.8% and this was adequate for the study. The detailed results on the response rate are shown in table 4.1 below;

**Table 4. 1: Response Rate**

| <b>Responses</b>          | <b>Frequency</b> | <b>Percentage</b> |
|---------------------------|------------------|-------------------|
| Questionnaires returned   | 209              | 87.8              |
| Questionnaires unreturned | 29               | 12.2              |
| Total                     | 238              | 100.0             |

The above findings concur with Livingston, Edward & Wislar, (2012) who revealed that in survey research, response rate, also known as completion rate or return rate, of 60% and above is sufficient for the study results to be reliable and valid. This also implied that the study tools were free from sampling bias.

**4.2 Findings on demographic characteristics of respondents**

The demographic characteristics which the study targeted include; gender, age, education level, and working experiences in academic records management. The findings are presented in the tables below.

#### 4.2.1 Gender distribution of the respondents

Respondents of different sex at KyU were sought in order to obtain information from both males and females. The results in the table 4.2 below show the categories that participated in the study together with their representative percentages.

*Table 4. 2: Gender of respondents*

| Gender | Frequency | Percentage |
|--------|-----------|------------|
| Male   | 127       | 60.8       |
| Female | 82        | 39.2       |
| Total  | 209       | 100.0      |

*Source: primary data (2020)*

Results in table 4.2 revealed that 127 (60.8%) respondents were males and they constituted the highest proportion of the respondents while 82 (39.2%) respondents were females who represented the least proportion of the respondents in the study. The ratio of male to female respondents who participated in the study was established and this was relevant in integrating dependence roles respect to assessing the effect of information communications technology on academic records management at Kyambogo University in that more male staff were employed/assigned to handle the technical aspects of ICTs such as uploading data on AIMS portals, maintenance of hardware and software, website management and control from non-users/hackers while females used ICTs to capture, store and retrieve students' academic data.

#### 4.2.2 Age bracket of Respondents

In bid to elicit about the respondents' age bracket, participants were asked to indicate their age group in the questionnaire and the findings are clearly shown in table 4.3 below;

*Table 4. 3: Age group of respondents*

| Age group    | Frequency | Percentage |
|--------------|-----------|------------|
| 25-30        | 63        | 30.1       |
| 31-35        | 30        | 14.4       |
| 36-40        | 49        | 23.4       |
| 41 and above | 67        | 32.1       |
| Total        | 209       | 100.0      |

*Source: primary data (2020)*

The findings in the table above show that majority of the respondents (32.1%) were aged 41 and above, 30.1% of the respondents followed with the age interval of 25 to 30 years, and the least

proportion of the respondents (14.4%) were aged between 31 and 35 years. The results consequently imply that majority of the respondents were mature and experienced-aged from 31 years and above which was a suitable age bracket to provide basic information about utilisation of ICT in influencing efficient records management Practices.

#### 4.2.3 Education level of respondents

The researcher administered research tools to establish the qualifications of the respondents employed to handle both ICT and handle students' academic records at Kyambogo University. The information was tabulated in the following table;

**Table 4. 4: Education level of respondents**

| Education level                                  | Frequency  | Percentage |
|--|------------|------------|
| Diploma  | 3          | 1.4        |
| Degree   | 112        | 53.6       |
| Masters and postgraduate certificates & diplomas | 59         | 28.2       |
| PhD  | 35         | 16.7       |
| Total  | <b>209</b> | <b>100</b> |

*Source: Primary data (2020)*

The evidence presented in table 4.4 shows that most of the respondents in the study were degree holders (53.6%), followed by masters and postgraduate certificates & diplomas (28.2%) and PhD holders (16.7%) while the least proportion of respondents (1.4%) were diploma holders. This implies that majority of the respondents in this study were elites to provide vivid and reliable information based on the academic knowledge, skills and experience about the ICT and students' academic records at Kyambogo University.

#### 4.2.4 Respondents Working experience in Academic records management

The respondents were asked to indicate the number of years they had worked in academic records management at KyU. This was expected to help the researcher know the kind of experience and how effective they would be able to give information about the ICT and students' academic records management. The results are shown in table below:

**Table 4. 5: Working experience of respondents in academic records management**

| <b>Working experience</b> | <b>Frequency</b> | <b>Percentage</b> |
|---------------------------|------------------|-------------------|
| 5 years and below         | 122              | 58.4              |
| 6-10 years                | 41               | 19.6              |
| 11-16 years               | 25               | 12.0              |
| 17 years and above        | 21               | 10.0              |
| <b>Total</b>              | <b>209</b>       | <b>100</b>        |

*Source: primary data (2020)*

The study made an attempt to find out the working experience of respondents in academic records management and the results are detailed in table 4.5. It is evident that majority of the respondents had a working experience of 5 years and below (58.4%), followed by 19.6% with a working experience between 6 and 10 years, 12% of the respondents were aged between 11-16years while the minority (10%) had a working experience of 17 years and above. The implication of the above finding is that majority of the staff had worked for a considerable period of time and thus were familiar/ knowledgeable with issues regarding ICT and KyU records management. This helped to enrich the study findings.

### **4.3 Descriptive statistics on study variables**

The study presents the descriptive statistics on; the availability of ICT Hardware, Quality of ICT Software, and ICT human resources competencies of Kyambogo University.

#### **4.3.1 Descriptive statistics on the availability of ICT Hardware**

This section presents the mean scores and standard deviations on the statements of the availability of ICT Hardware at Kyambogo University. The availability of ICT Hardware was measured using 8 items rated on a five-point Likert scale ranging from 5= Strongly Agreed, 4= Agree, 3= Not Sure, 2= Disagree and 1= Strongly Disagree. The results from the mean which are lower than 3 indicate low rating scale criteria and the mean score above 3 indicates high rating on the item by respondents. The results are shown below.

**Table 4. 6: Descriptive findings on the availability of ICT Hardware at Kyambogo University**

| Statements  | Mean | Std. Deviation |
|---|------|----------------|
| KyU has desktop computers used for data capturing   | 4.66 | 0.476          |
| KyU has enough Laptops to reduce rampant missing results.   | 3.24 | 1.234          |
| My computer has sufficient memory to store data   | 4.05 | .942           |
| My computer can process data faster   | 3.96 | 1.037          |
| KyU has adequate computer monitors to provide data output for information display   | 4.22 | .843           |
| KyU has sufficient printers that provide large volume printing as well as priority to the best quality and clarity output | 3.93 | 1.267          |
| KyU has necessary hard disks drives for storage and retrieval of digital data   | 4.00 | 1.007          |
| All the other computer accessories of my personal computer work together for proper running of the computer.              | 3.68 | 1.232          |

**Source: primary data (2020)**

Table 4.6 presents the respondents’ responses on the 8 items of the availability of ICT Hardware at Kyambogo University. Concerning desktop computers, majority of the respondents agreed that KyU has desktop computers used for data capturing as shown by a high-level mean (4.66) which is above 3. This meant that both ICT directorate and academic records offices under the academic registrars’ department, schools, faculties and departments were fully equipped with desktop computers consisting of accessories such as; monitor, peripherals, and other types of external hard drives that aid creation/receipt, maintenance and use, file arrangement of students’ academic records,

In addition to the quantitative data, interviews with the directorate of ICT staff held on 27<sup>th</sup> November, 2020 about the computer components (physical parts/hardwares) available at Kyambogo University revealed that,

*“ICT directorate through ICT policy was funded by the university through the budget between 2013 and 2019 to boost ICT infrastructures in all departments and units. He added that procurements were made for External and internal Hardware that cover: external Hardware; Mouse, Screen, Central processing units, Keyboard, Monitor, Router, Mouse, Scanners, Printers, Digital cameras and CD-ROM among*

*others. Whereas Internal hardware purchased include; Motherboard, Hard disk drive, Random Access memory (RAM)”, said interviewee A.*

In terms of enough laptops, findings revealed that Kyambogo University has enough laptops to reduce rampant missing results (mean score=3.24). The implication of the above finding is that the university had acquired some laptops to meet the needs of managing students’ academic records, with a long battery life to last a whole day.

In support of the quantitative data, Interviews with the directorate of ICT held on 27<sup>th</sup> November, 2020 on availability of Laptops at Kyambogo University revealed that,

*“They have the best laps intel 7<sup>th</sup> generation with specifications: **CPU:** 10th Gen Intel Core i3 – i5, **Graphics:** Intel UHD Graphics, **RAM:** 8GB – 16GB; **Screen:** 14-inch LED-backlit Full HD (1920 x 1080) 16:9 display; **Storage:** 512GB / 256GB / 128GB SSD but on the contrary they are not enough for all staff handling students’ academic records”, said interviewee C.*

In regards to memory of computers, the majority of the respondents agreed that their computers had sufficient memory to store data (mean score=4.05). Concerning data processing, the majority of the study respondents supported that their computers could process data faster (mean score=3.96).

The study sought to investigate whether Kyambogo University has adequate computer monitors to provide data output and display information. The results indicate that a bigger number of respondents agreed that the University has adequate computer monitors to provide data output and display information (mean score=4.22).

The finding above concurs with interview results from academic registrar’s department which indicate that,

*“ICT monitors are used in computer labs for teaching, in offices for administrative and research functions carried out at the universities the ICT Directorate is mandated with planning, managing and maintaining the ICT infrastructure. Information and Computing services are available throughout the university to aid students and staff alike have access to computing facilities via a managed computer network. The directorate is charged with the duty of planning, implementing and maintaining the university ICT infrastructure”, says AR<sub>2</sub>.*

The study found out that Kyambogo University has sufficient printers that provide large volume printing as well as priority to the best quality and clarity output (mean score=3.93). This means that the university have big printers that can print, photocopy, scan and transfer files.

The quantitative data is supported by qualitative data from interviews with the directorate of ICT as stated below;



*“Kyu uses Kyocera printers which provide the tools needed to transform the way organization works, boost productivity, reduce waste and increase collaboration, an interviewee revealed. The interviewee added that the KyU outsourced printing services and all departments and units have KYOCERA Printing centralised point(s) with a utility app that supports KYOCERA printing devices and scanning devices that share a network connection with Windows 10 devices. The interviewee further noted that the app is primarily a scan driver and a device monitor which also includes a library of printable templates and a camera interface”, said interviewee B.*

In relation to hard disks drives for storage and retrieval of digital data, it was established from the study that Kyambogo University has necessary hard disks drives for storage and retrieval of digital data (mean score=4.00). A bigger proportion of the study respondents agreed that the other computer accessories of their personal computers work together for proper running of the computer.

#### **4.3.2 Descriptive statistics on the Quality of ICT Software at Kyambogo University**

The researcher presents the mean scores and standard deviations on the statements of the Quality of ICT Software. The Quality of ICT Software was measured using 8 items rated on a five-point Likert scale ranging from 5= Strongly Agreed, 4= Agree, 3= Not Sure, 2= Disagree and 1= Strongly Disagree. The results from the mean which are lower than 3 indicate low rating scale criteria and the mean score above 3 indicates high rating criteria on the item by respondents. The study outcomes are detailed in the table below.

**Table 4. 7: Descriptive findings on the Quality of ICT Software at Kyambogo University**

| <b>Statements</b>   | <b>Mean</b> | <b>Std. Deviation</b> |
|---|-------------|-----------------------|
| I believe that the quality of ICT Software is dependable as it helps KyU uphold integrity of academic records | 4.18        | 0.931                 |
| Our ICT software is user friendly in analysing students’ academic information                                 | 4.21        | 0.791                 |
| I use ICT software to facilitate students’ overall quality admissions into university                         | 4.12        | 0.774                 |
| The quality of ICT Software allows growth with the needs of institutional records.                            | 4.16        | 0.771                 |
| KyU software permits encrypting of students’ files against unauthorized use.                                  | 3.86        | 1.046                 |
| KyU ICT software provides secure web applications for academic records  | 4.14        | 0.940                 |
| The Kyu ICT software provides richer user interface   | 4.08        | 0.978                 |
| KyU software quality allows update to correct faults for improved performance                                 | 4.13        | 0.861                 |

**Source: primary data (2020)**

Table 4.7 presents the mean scores and standard deviations on each statement on the Quality of ICT Software at Kyambogo University. The study findings established that the quality of ICT Software is dependable as it helps Kyambogo University to uphold integrity of academic records (mean score=4.18).

In addition to the quantitative data, Interviews with the directorate of ICT indicated that held on 27<sup>th</sup> November, 2020 about the Software dependability revealed that,

*“we conducted evaluation of various softwares (vendor software) meant for the University and choose the best for keeping Examination results and students records onto their respective portals, online Portal management for academic registration process and enhanced record keeping and above all ICT directorate hosts an in-house software for complete automation of examination records and provide strategic support to all academic departments in the University”,* said interviewee D.

The ICT software was found out to be user friendly in analyzing and disseminating students’ academic information (mean score=4.21). This means that, the directorate of ICT is charged with the responsibility of software development and maintenance within the sphere of their skills in partnership with the vendor (ICT service provider), sister institutions or individuals/group of individuals outside the services of the University on agreed contractual terms.

**Interview Results**

*Kyu uses the Academic Information Management System (AIMS) platform for managing students’ academic records and it is integrated with the University’s administrative systems for data exchange. AIMS also provides KyU repository, students Portals to make the University’s database publicly accessible,* says AR<sub>1</sub>.

The study revealed that the staff of Kyambogo University use ICT software to facilitate students’ overall quality admissions into university (mean score=4.12). This implies that admission errors, fraud are minimized /curbed and only students who qualify for admission to specific courses are admitted with the use of ICT quality software.

Interviews with the academic registrar’s department in regard to the, ICT quality software revealed that,

*“Formally without ICT student’s admission into the university was married with students having to travel long distances to campus, stay in long queues to bank application fees and could be robbed by thugs and be provided with fake admission*

*letters, which is now history. Hence, the system streamlined admission processes, quality of student intake and curbed admission fraud”, says AR<sub>4</sub>.*

The majority of the respondents acknowledged that the quality of ICT Software in Kyambogo University allows growth with the needs of institutional records (mean score=4.16). This means that the application of ICT provides access to students’ data base on education statistics and indicators to allow policymakers to incorporate evidence-based decision making into their programming.

The findings correspond to interview results from the heads of departments where one of the respondents said that,

*“ICT at KYU provides regular and reliable students’ academic records which grow with student admission, enrollment and registration. This is essential for planning and policy, financial management, management of schools and faculties, decisions about school personnel (including lecturers, data entrants, registrars) and support for student learning”, said HoD<sub>1</sub>.*

The study made an attempt to find out whether the computer software permits encrypting of students’ files against unauthorized use. It was evident from the study that most of the respondents were in agreement that software used permits encrypting of students’ files against unauthorized use (mean score=3.86). This implies that bulk data files of student’s data are condensed to smaller sizes for easy storage in AIMS.

*The questionnaire results above correspond to interview findings from the directorate of ICT who revealed that, in order to help mitigate risks associated with students’ academic record such as physical loss or theft, computer hard drives (and other devices such as USB keys and flash drives), ICT aids to encrypt such records to prevent unauthorized access to information by unauthorized persons/hackers, said interviewee E.*

*Whole Disk Encryption (WDE) is centrally supported by Kyambogo University Systems and provides benefits such as encrypting an entire hard disk, central management, policy enforcement, encryption key management, and recovery. The interviewee added that WDE protects students’ files if the University computer is lost or stolen and if someone tries to break into KYU ICT system to retrieve files, they will not be able to access the computer as long as they do not have KyU password. This is mostly done for KyU laptops and desktop systems with confidential data, said interviewee E and A.*

*Further interview with the ICT directorate revealed that, when you move an encrypted file off of a computer, it is no longer encrypted. If an encrypted computer is left unattended while the user is logged in, the files are accessible and the data is not protected. He advised records managers during training that the best protection of university data from physical loss or theft is to avoid storing it on a*

*desktop, smart phone, or USB device and use of emails*, said interviewee A, C and E.

The ICT software was revealed to be effective in providing secure web applications for academic records (mean score=4.14). The ICT software was established to be effective in providing richer user interface (mean score=4.08). In addition, the study found out that the quality of software used at Kyambogo University allows update to correct faults and to improve performance (mean score=4.13). This signifies that KyU Software functional quality reflects how well it complies with or conforms to a given design, based on functional requirements or specifications for management of students' academic records.

The above study results is supported by Interview findings which revealed that,

*“The attributes of KyU software are described as the fitness for purpose and worthwhile for handling students' academic records. The directorate of ICT assessed the reliability of AIMS software to suite the best practices and technical specifications among which included: Application Practices, Coding Practices for students' course units, Complexity of algorithms of students' scores, Complexity of programming practices for each course offered by the student and compliance with programming best practices”* said interviewee B and D.

#### **4.3.3 Descriptive Statistics on ICT human resources competencies at Kyambogo University**

This subsection presents the mean scores and standard deviations on items of ICT human resources competence at Kyambogo University. The ICT human resources competencies was measured using 8 items rated on a five point Likert scale ranging from 5= Strongly Agreed, 4= Agree, 3= Not Sure, 2= Disagree and 1= Strongly Disagree. The results from the mean which are lower than 3 indicate low rating scale criteria and the mean score above 3 indicates high rating on the item by respondents. The results are presented in table below.

**Table 4. 8: Descriptive findings on ICT human resources competencies**

| <b>ICT human resources competencies</b>  | Std. |           |
|--|------|-----------|
|  | Mean | Deviation |
| I am knowledgeable in capturing electronic records accurately  | 2.69 | 1.472     |
| I have the skill for retrieving electronic records   | 2.76 | 1.650     |
| I uphold data entry specifications procedures to ensure integrity of the students' information                         | 4.02 | 1.201     |
| I hold the potential to store students' data using established ICT formats to communicate results effectively          | 4.06 | 1.311     |
| I am able to perform basic equipment maintenance tasks in the electronic repositories                                  | 2.77 | 1.378     |
| I am trained and skilled in basic records appraisal principles of records classification in the database programmes    | 2.87 | 1.478     |
| I am trained on quality control procedures when analyzing data to identify discrepancies in bulk students' information | 2.84 | 1.414     |
| I am experienced to handle students' records following the generally Accepted Recordkeeping Principles                 | 2.95 | 1.405     |
| I am regularly trained in academic records management software usage   | 2.27 | 1.300     |
| <b>Overall average</b>   | 3.03 | 1.401     |

The descriptive findings in table 4.8 show the mean scores and standard deviations on the statements of ICT human resources competencies at Kyambogo University. Regarding creating and capturing electronic records accurately, the majority of the respondents disagreed that they were knowledgeable in creating and capturing electronic records accurately (mean score= 2.69). The study established that the staff have the skill for searching/tracking, accessing and retrieving electronic records (mean score=2.76). This means that staff had inadequate technical expertise in handling electronic document within KyU repositories thus imposing errors in to student registration, updating of examination records as well as access and retrieving students academic records.

In the same vain, interview results revealed that,

*“human resources at KyU have limited competencies in records management. Staff cannot adequately neither create, store, retrieve students' academic records electronically, nor use them in computerized form for long periods. The respondent stated that this is perhaps, due to the fact that management of students records in AIMS presents new and complex challenges to the University as a whole. AIMS service providers need to provide structure, consistency, security, and control over these records”* said the Dean, D<sub>1</sub> and HoD<sub>3</sub>.

In terms of upholding data entry specifications and procedures, the majority of the study respondents strongly agreed that they uphold data entry specifications and procedures to ensure

integrity of the students' information (mean score=4.02). This means that, upholding data entry specifications and procedures aid maintenance of effective students' academic records database report system, including acceptance/denial, and evaluated grant requests for accuracy.

Interview results from one of the Deans contravene the questionnaire results by which one interviewee revealed that,

*Human resources lack competency in Checking and Validating the Accuracy of students course work marks, retakes, and examinations results. He further explained that data entry clerks have limited understanding of the nature of the information before entering it. This has caused inaccurate maintaining of students results for faster production of transcripts, said the Dean, D<sub>3</sub>.*

The study found out that the Kyamogo University staff have the potential to store students' data using established ICT formats and communicate results effectively (mean score=4.06). This implies that ICT has helped staff generate knowledge and processes to develop systems that solve problems help students access their results from anywhere, gather assignments, analyze, present, transmit, and simulate information.

The above finding disregards qualitative data where an interviewee in regard to what challenges do human resources face in managing academic records at Kyambogo University revealed that,

*"human resources: lack clear record retention and disposal policy, delay to conduct maintenance and servicing of systems, Lack of enough storage space. And above all do not have specified filing system in place for proper and efficient students' academic records management", said the Dean, D<sub>2</sub> and HoD<sub>2</sub>.*

The respondents acknowledged that they are in position to perform basic equipment maintenance tasks in the electronic repositories (mean score=2.77). This means that KyU has ICT Support and Maintenance Unit to manage regular hardware and software challenges to enable fundamental needs of academic strategies and university operations internally and externally.

Interview results coincide to questionnaire findings in that an interviewee revealed that,

*"the directorate of ICT Coordinates the development and maintenance of the University's Information Security Policy, conducts management of institutional database (students data, academic records, staff records, financial data) etc; supports the university library management system and institutional repository; provide support to the Learning Management System (LMS) and Plagiarism Checker (turnitin software); do website development and management solutions, provide first line of support for students and assess problems from clients and make appropriate referrals", said the Dean, D<sub>5</sub>, D<sub>4</sub> and HoD<sub>4</sub> & HoD<sub>5</sub>.*

Regarding whether respondents are trained and skilled in basic records appraisal principles and vital records classification in the database programmes, the study established that the staff of KyU are not trained and skilled in basic records appraisal principles and vital records classification in the database programmes (mean=2.87). This implies that records students' academic records management processes is weak to take into account of workflow, records quantity and formats, and operational needs of the university.

The researcher sought to find out whether respondents are trained on quality control procedures when analyzing data and the findings were supportive. The results showed that the staff of Kyu are not trained on quality control procedures when analyzing data to identify discrepancies in bulk students' information (mean score=2.84).

The study found out that respondents were experienced to handle students' records following the generally Accepted Recordkeeping Principles and best practices (mean score=2.95). The study revealed that the staff of Kyambogo are not regularly trained in academic records management software usage (mean score=2.27).

#### **4.4 Multiple linear regression findings on the effect of availability of ICT Hardware and quality of ICT Software on academic records management of Kyambogo University**

The regression analysis was performed to examine the first and second objective of the study that is to examine the effect of the availability of ICT Hardware and quality of ICT Software on academic records management of Kyambogo University. The findings are presented in the table 4.9 below using multiple linear regression at 0.05 level.

**Table 4. 9: Multiple linear regression on the effect of the availability of ICT Hardware and quality of ICT Software on academic records management**

| Model |            | ANOVA <sup>a</sup> |     |             |        | Sig.              |
|-------|------------|--------------------|-----|-------------|--------|-------------------|
|       |            | Sum of Squares     | df  | Mean Square | F      |                   |
| 1     | Regression | 31.917             | 2   | 15.959      | 46.589 | .000 <sup>b</sup> |
|       | Residual   | 70.564             | 206 | .343        |        |                   |
|       | Total      | 102.482            | 208 |             |        |                   |

a. Dependent Variable: Academic records management  
b. Predictors: (Constant), The availability of ICT Hardware, Quality of ICT Software

| Model Summary |                   |          |                   |                            |
|---------------|-------------------|----------|-------------------|----------------------------|
| Model         | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1             | .558 <sup>a</sup> | .311     | .305              | .58527                     |

a. Predictors: (Constant), The availability of ICT Hardware, Quality of ICT Software

| Coefficients |                                  |                             |            |                           |       |      |
|--------------|----------------------------------|-----------------------------|------------|---------------------------|-------|------|
| Model        |                                  | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig. |
|              |                                  | B                           | Std. Error | Beta                      |       |      |
| 1            | (Constant)                       | 1.379                       | .282       |                           | 4.892 | .000 |
|              | The availability of ICT Hardware | .174                        | .076       | .166                      | 2.302 | .022 |
|              | Quality of ICT Software          | .479                        | .078       | .442                      | 6.128 | .000 |

a. Dependent Variable: Academic records management

**Source: primary data (2020)**

The results in table 4.9 show that there was a positive and significant effect of the availability of ICT Hardware on academic records management of Kyambogo University (B=0.174, P-value=.022). It is indicated using beta coefficient (0.174) that additional hardware provided by the university results into an improvement in academic records management by 0.174.

The results also indicate that there was a positive and significant effect of the quality of ICT software on academic records management of Kyambogo University (B=0.479, P-value=.000). The observation from the Beta coefficient of the quality of ICT software (0.479) shows that



additional improvement in the quality of ICT software results into an improvement in the academic records management by 0.479.

The observation from the ANOVA results shows that the F-test was significant at 5% level implying that the availability of ICT Hardware and the quality of ICT software statistically predict the academic records management at Kyambogo University (F=46.589, P-value=0.000). The model produced the Adjusted R Square results of 0.305 and this indicates that the availability of ICT Hardware and the quality of ICT software account for only 30.5% of the variations (changes) in academic records management at Kyambogo University. While the remaining 69.5% is explained by other factors such as compatibility, useability, maintainability, reliability of operating system as well as performance efficiency not incorporated in the model.

#### 4.5 Relationship between ICT human resources competencies and academic records management of Kyambogo University

The last objective of the study was to examine the relationship between ICT human resources competencies and academic records management of Kyambogo University. The results are presented in the table below.

**Table 4. 10: Correlation findings on the relationship between ICT human resources competencies and academic records management of Kyambogo University**

|                 |                                  |                         | ICT human resources competencies | Academic records management |
|-----------------|----------------------------------|-------------------------|----------------------------------|-----------------------------|
| Spearman's rho  | ICT human resources competencies | Correlation Coefficient | 1.000                            | .464**                      |
|                 |                                  | Sig. (2-tailed)         | .                                | .000                        |
|                 |                                  | N                       | 209                              | 209                         |
|                 | Academic records management      | Correlation Coefficient | .464**                           | 1.000                       |
| Sig. (2-tailed) |                                  | .000                    | .                                |                             |
| N               |                                  | 209                     | 209                              |                             |

\*\* . Correlation is significant at the 0.01 level (2-tailed).

*Source: primary data (2020)*

The findings in table 4.10 show that ICT human resources competencies had a positive moderate and significant relationship with academic records management of Kyambogo University as indicated by a positive and significant correlation coefficient of 0.464 and a probability value

(0.000) which is below 0.01 level of significance. This implies that improvement in ICT human resources competencies will enhance academic records management of Kyambogo University. The result on table 4.10 indicated that at p-value being 0.00 less than 0.01 alpha level. The null hypothesis (Ho) is not supported while the alternate hypothesis (Ha) is supported. This implied that there is significant difference between ICT human resources competencies and academic records management of Kyambogo University.

#### **4.6 Academic Records Management**

The dependent variable the study was to examine the academic records management of Kyambogo University. Quantitative data was gathered using a questionnaire and merged with qualitative data from the interview results. The results are presented in the table below.

**Table 4. 11: Academic Records Management**

| <b>Academic Records Management</b>   | <b>Mean</b> | <b>Std. Deviation</b> |
|--|-------------|-----------------------|
| <b>Easy and Rapid Access of records</b>  |             |                       |
| I am able to provide quick access to information needs of clients  | 2.77        | 1.546                 |
| I do regular filing of records to enhance speedy access to information   | 4.11        | .853                  |
| I provide access to academic records for quick decision-making   | 2.78        | 1.348                 |
| I perform systematic indexes to facilitate records' easy retrieval   | 3.07        | 1.133                 |
| I conduct scheduling for easy access to personal data  | 3.84        | .996                  |
| <b>Timely completion of tasks</b>  |             |                       |
| I am able to provide students results with progress reports on time  | 2.85        | 1.396                 |
| It takes me a shorter time to capture and update students' academic record in the system   | 2.91        | 1.443                 |
| I can retrieve students' academic records in the shortest time possible  | 3.44        | 1.362                 |
| Students academic records stored in bulk can be achieved in a short time   | 2.74        | 1.348                 |
| I disseminate students' academic records to those concerned in the shortest time possible.   | 2.73        | 1.353                 |
| <b>Operation Precision</b>   |             |                       |
| I hold students' academic records to allow accurate processing of transcripts and certificates   | 3.85        | 1.133                 |
| I manage record in proper ways to prevent loss or missing of records   | 4.23        | .726                  |
| I monitor usage for record-keeping system maintenance  | 4.19        | 2.897                 |
| I enforce compliance with key records management functions and requirements  | 3.79        | 1.030                 |
| I can identify areas requiring improvement with regard to desirable best practices   | 4.00        | 1.026                 |
| KyU records management provides self-evident information (e.g. who created it, when, to whom was it sent, why) to enable records useable over time | 2.79        | 1.523                 |
| Academic Records Management enables encryption to improves records safety  | 4.11        | .893                  |
| <b>Task control and Flexibility</b>  |             |                       |
| Academic records management at KyU permits update of students' information   | 2.79        | 1.567                 |
| Authentication of students' academic documents after they have left the institution is done easily   | 2.97        | 1.289                 |
| Proper records management has enhanced legal suits and minimized costs   | 2.90        | 1.187                 |
| Financial accountability and accurate reporting enhanced through proper records management   | 3.02        | 1.160                 |
| <b>Valid N (listwise)</b>  | <b>2.92</b> | <b>1.301</b>          |

**Source: primary data (2020)**

Table 4.11 above provides the summary of the findings on academic records management at Kyambogo University. These were measured in terms of; easy and rapid access of records, timely completion of tasks and operation precision.

The respondents revealed that they were able to provide quick access to information needs of clients (mean =2.77). This meant that students were impeded from accessing critical information being hard to access and nearly impossible to process their transcripts especially before enrolling, making full payments and registering on the portal.

Regarding, easy and rapid access of records majority of the respondents agreed that they conducted regular filing of records to enhance speedy access to information (mean = 4.11). This meant that students academic records that facilitate administrative and executive operations were filed but associated with much delay in availability and accessibility hence affecting decision making as well as service delivery.

Interview results with results coordinators on how effective records management was conducted with management indicated that;

*With key informants revealed that results coordinators, including the Registrars, administrative assistants and academic registrar were recruited with clear background, knowledge and skills in the field of students' academic records management. As a result, records office staff were well versed with the allocation of course codes and with filing system maintenance procedures to avoid misplacement or misfiling of students' academic records, said RC<sub>1</sub>.*

The study established that records staff provided access to academic records for quick decision-making (mean = 2.78 ). This means that records documentation of the origin of students results, evolution, and operation of KyU showed negative response to the needs of students and served graduated students painfully.

Interview results with key informants indicated that

*"students' academic records have a great impact on the administration and management of education quality of higher institutions of learning. When organisations/employers seek availability and retrieval of students' academic records during verification exercise the policies processes, practices and procedures relied heavily on disorganised and mismanaged information and records management system. This delayed students employment and confirmation in job market, said RC<sub>1</sub>, RC<sub>2</sub>, and RC<sub>3</sub>.*

In terms of upholding quick and rapid access respondents revealed that, they performed systematic indexes and classification to facilitate records' easy retrieval (mean = 3.07). This means that records management is about overseeing the creation and use of forms, correspondence, and other records, setting up filing and indexing systems and other means of ensuring easy, rapid access to the information in records; adopting and using modern technology in information creation, storage, and manipulation, particularly micro-film and automated data processing systems

The study found out that Kyamogo University staff conducted scheduling for easy access to personal data (mean = 3.84). This implies that staff were moderately conducting records scheduling which hindered systematic planning and orderly implementation of records disposal, creation and compliance with legal requirements.

In response to timely completion of tasks, records staff acknowledged that they retrieved students' academic records in the shortest time possible (mean =3.44). This signifies that schedule for students' academic records enabled KyU to manage records such students results from year 1 to year 5, course works and tests for every course unit taught and examined, students bio-data, track enrollment and registration status as well as fees ledgers.

Interview results with results coordinators on how effective records management was conducted further revealed that;

*KyU has a well-developed programme system of maintaining and implementing students' academic records classification systems, namely the File Plan and the students' academic records control schedule. The programme comprises of these elements: appointment/designation of a results coordinators, development of a records management policy and records management procedure manual, compilation of a file plan and records control schedule, records control mechanisms, disposal programme and training of results coordinators in academic information's management system (AIMS). These elements is used to benchmark KyU current students' academic records management practices against prescribed legislative requirements said RC<sub>4</sub>, RC<sub>5</sub>, and RC<sub>6</sub>.*

Furthermore, the respondents revealed that at KyU students' academic records were stored in bulk and could be retrieved in a short time (mean = 2.74). this implies that KyU uses AIMS as a modern ICT to create, store, and manipulate automatically process testimonials, secure examination results, ease of access and preserve long-term important information, and

systematically disposing of students' academic records but records management has not been attained.

Concerning timely completion of tasks, majority of the respondents disagreed that they disseminate students' academic records to those who require them in the shortest time possible (mean =2.73). This meant that though KyU uses AIMS to create and maintain a positive records culture, promoting effective and efficient students' academic records management to facilitate timely decision making has not yet materialized.

Interview results with results coordinators and heads of departments on how effective records management was conducted also showed that;

*During interviews with academic registrar's department, it was revealed that the right students marks through examinations coordinators did not reach the senate committees and examinations boards for approval at the right time. This was because lecturers take time to mark examination scripts, delayed payments of part-time lecturers also causes delay in capturing students' academic results into the system. This delay results to reach heads of departments who also need all marks for various course units before sending to administrative assistants who in turn cannot prepare them for discussions by departments, faculties and schools examination boards who in turn present to senate committees. This stringent procedure for managing students' academic records manifested through approved regulations and guidelines prevent manipulation of records before they are stored and maintained in AIMS, said AR<sub>5</sub>, AR<sub>6</sub>, RC<sub>7</sub>, RC<sub>8</sub>, and RC<sub>9</sub> and HoD<sub>5</sub>, HOD<sub>6</sub> and HOD<sub>7</sub>.*

In line with operation precision, the study established that results coordinators hold students' academic records to allow accurate processing of transcripts and certificates (mean = 3.85). This means that keeping accurate students' academic records using AIMS moderately enable KyU to serve students' needs quickly upon graduation.

The above quantitative data agrees with the qualitative data obtained during interviews with key informants who revealed that,

*Without accurate and relevant students results, academic documents cannot be prepared and issued in time. Therefore, KyU will be defeated in courts of law and spend money intended for service delivery in court cases due to students missing employed due to delayed release of academic transcripts and certificates. Proper management of students' academic records enables KyU sieve out ghost students who do not register, complete courses and forge academic papers from Nasser road in Kampala. Further still it is costly for KyU to sustain the costs and track the exact*

*expenditure on academic documents such as transcript blanks, said D<sub>4</sub>, AR<sub>3</sub>, D<sub>6</sub>, D<sub>1</sub>, RC<sub>10</sub>, RC<sub>11</sub>, and RC<sub>12</sub> and HoD<sub>8</sub>, HOD<sub>9</sub> and HOD<sub>10</sub>*

Further still the study results in terms of upholding operation precision, indicated that KyU manages students' academic records in proper ways to prevent loss or missing of records (mean = 4.23). This means that the purpose of an efficient students' academic records management system is that it acts as a control system that reinforces other control systems such as internal and external auditing.

The study found out that Kyambogo University monitors usage of record-keeping system maintenance and security (mean=4.19). This implies that AIMS enables KyU to maintain and enhance appropriate students' academic records management.

This concurs with qualitative data obtained from interviewees where respondents indicated that sound records management is fundamental for good governance, effective and efficient administration of the University. It forms the basis for formulating policies, managing resources and the delivery of services to the public. It also enables KyU to find information easily in an orderly and efficient way.

The respondents acknowledged that KyU enforces compliance with key records management functions and requirements (mean=3.79). This signifies that accountability was moderately achieved by ensuring compliance with the law, internal and external regulations and fulfilling auditing requirements.

The above quantitative data agrees with qualitative information from interviews which revealed that authentic and reliable students' academic records serve as evidence to identify abuse, misuse and non-compliance with educational quality requires and other tertiary and institutional Act, education Act, laws and regulations. Essentially to ensure compliance with; Ministry of Education and office of the Auditor General's requirements, KyU keeps proper records of administrative actions and decisions.

The respondents revealed that they can identify areas requiring improvement with regard to desirable best practices and formulation of plans to implement improvement measures for records management (mean =4.00). This means that However, there is at times misfiling emanating from

misallocation of course codes and credit units, staff could not continue to act in transgression by not handling documents properly.

The above finding concurs with interview results from interviewee in which he revealed that, “Students’ academic records planning is done at KyU and this involves the establishment of an off-site (off AIMS) storage to keep duplicate or backup records in addition to the clouds. This filed plan approved by senate committee is a documentation of all results for every year graduating group arranged and stored to facilitate efficient retrieval within the institution repository and disposal.

The findings in table 4.11 further revealed that majority of the respondents disagreed that KyU records management provides self-evident and ready contextual information (e.g. who created it. when, to whom was it sent, why) (mean = 2.79). This meant that students electronic academic records have a vulnerable nature experience nonappearance of self-evident and ready contextual information to enable that the records are understandable and useable over time.

The study established that students’ academic records management enable encryption to avoid hacking and improves records safety (mean = 4.11). This means that encryption is applied at KyU to secret information and students’ academic record are kept, classified, transmitted and received.

In terms of keeping Task control and Flexibility, respondents indicated that students Academic records management at KyU permits update of students’ information (mean =2.79). This means that updating students academic records was not conducted on a regular basis and made it difficult to avail students information as and when requested. Separate file plans were not compiled based on students academic records and master copies were not accurately updated on a regular basis in AIMS.

The study found out that the Kyambogo University Authentication of students’ academic documents after they have left the institution is done easily (mean =2.97). This implies that AIMS indexed file plans could not classify students’ academic records that are created or retained. The criteria for authentication of data messages were not appropriately identified.



The respondents acknowledged that proper records management has enhanced legal suits and minimized costs (mean=2.90). This signifies that to support continuing service delivery and provide the necessary accountability, KyU did not create and maintain authentic, reliable and usable records.

Regarding, keeping Task control and Flexibility, table 4.11 findings showed that the majority of the respondents disagreed with the view that financial accountability and accurate reporting enhanced through proper records management (mean =3.02). This meant that KyU moderately conducted task monitoring and best practices of students' academic records management practices.

## **CHAPTER FIVE**

### **DISCUSSION, SUMMARY, CONCLUSION AND RECOMMENDATIONS**

#### **5.0 Introduction**

This chapter presents the discussion of the major findings, provides a summary of the results, conclusions, recommendations drawn based on the study objectives and area for further research. These were based on information communications technology and students' academic records management at Kyambogo University in relation to the study objectives.

#### **5.1 Discussion of the major findings**

##### **5.1.1 The effect of the availability of ICT Hardware on academic records management of Kyambogo University**

The study results indicated that KyU had sufficient ICT hardware such as laptops to reduce rampant missing results (mean score=3.24). The University acquired laptops to meet the needs of managing capturing and storage of students' academic records, with a long battery life to last a whole day. The other available external Hardware at KyU include; Mouse, Screen, Central Processing Units, Keyboard, Monitor, Router, Mouse, Scanners, Printers, Digital Cameras and Cd-Rom. On the otherhand internal hardware, Motherboard, Hard disk drive and Random-Access memory (RAM). The availability of adequate ICT hardware at KyU provided support for major functions in regard to management of students' academic records such as input, processing (internal storage, computation and control), output, secondary storage (for data and programs), and communication. ICT hardware were used at KyU for management of the most pivotal information about entities such as students' faculty, courses, applications, admissions, payment, exams, and grades. The finding concurs with Pacio (2013) who revealed that, computer hardware aid online registration and admissions of students, with online examination results access, student profile and finance as add-ons. Similarly, the finding is supported by Krishnaveni and Meenakumari (2010) who revealed that availability of ICT hardware aids to conduct online student information systems to depict a centralized virtual database where all information pertaining students are properly stored in an educational institution.

The findings revealed that Kyambogo University has the best laptops intel 7<sup>th</sup> generation with specifications: CPU: 10th Gen Intel Core i3 – i5, Graphics: Intel UHD Graphics, RAM: 8GB – 16GB; Screen: 14-inch LED-backlit Full HD (1920 x 1080) 16:9 display; Storage: 512GB / 256GB / 128GB SSD but on the contrary they are not enough for all staff handling students' academic records". Presence of Laptops as part of ICT hardware facilities helped to record the students' personnel data such as admission data and type of programme. Availability of sufficient Laptops help in handling much volume of information which the university needs to handle. The finding is in agreement with Bogere, *et.al.* (2013) who identified some importance of computer hardware in the management of students' academic records as; promoting and maintaining the standard and quality of work at a higher level over time than manual labour, saves cost, time and labour, increases productivity and efficiency. The finding also agrees with Clarke-okah, Ferreira and Kwan (2009) who noted that adoption of AIMS with efficient availability of ICT equipments such as desktop computers, laptops, internet access facilitates reduction of rampant missing results.

The study results also revealed that available ICT hardware was used for data processing (mean score=3.96). The moderate mean value signifies that students' academic results issued in form of transcripts to determine the ability of students to get job opportunities is hampered. After graduation, many students search for employment but their dreams often get shattered due to delayed processing of students' examination results. In relation to hard disks drives for storage and retrieval of digital data, it was established from the study that Kyambogo University has necessary hard disks drives for storage and retrieval of digital data (mean score=4.00). Computer accessories of their personal computers work together for proper running of the computer. The availability of ICTs enhances full and effective speed in processing students' documents such as testimonials, recommendations, transcripts with relative ease. Some students access WIFI from open space computer laboratories privacy concerns among the students, many students said that most of the times the labs are congested and their friends can easily see the examination results displayed upon logging in into the system. The finding agrees with Saud, Babawuro, Lokman, Buntat & Noraffandy (2011) who revealed that, students' marks for examinations can be recorded within the virtual learning environment (VLE) using computer hardware components.

The results in table 4.9 show that availability of ICT Hardware affected students' academic records management of Kyambogo University (B=0.174, P-value=.022). It is indicated using beta

coefficient (0.174) that additional hardware provided by the university results into an improvement in academic records management by 0.174. this meant that improving in the quality of ICT hardware results into an improvement in the academic records management by 0.479.

The observation from the ANOVA results shows that the F-test was significant at 0.05 level implying that the availability of ICT Hardware and the quality of ICT software statistically predict the academic records management at Kyambogo University ( $F=46.589$ ,  $P\text{-value}=0.000$ ). The model produced the Adjusted R Square results of 0.305 and this indicates that the availability of ICT Hardware caused only 30.5% of the variations (changes) in academic records management at Kyambogo University. While the remaining 69.5% is explained by other factors such as compatibility, useability, maintainability, reliability of operating system as well as performance efficiency not incorporated in the model. The finding is complementary to Krishnaveni & Meenakumari (2010) who spelt out that with the adoption of AIMS in academic institutions, its easy to harness and fast track all students' records in one centralized database via the internet technology using computer hardware. Similarly, Eze (2013) reported that Institutional administrators to use ICT hardware in scheduling courses, classrooms, inventory and personnel control, recording and reporting attendance, school accounting, storage and students' results management. This is capable of generating results, retrieving lecture timetable, enlisting of courses and registration online.

### **5.1.2 How the Quality of ICT Software affects academic records management of Kyambogo University.**

The study results in chapter four revealed that the staff involved in records management at Kyambogo University use ICT software to facilitate students' overall quality admissions into university (mean score = 4.12). This helped to reduce admission errors, curb fraud to only admit qualifying students to specific courses because of good quality software applicability. University management use various software applications in administration of students' academic records. The most frequently used software applications in KyU is AIMS and is supported by other Office tools such as; Microsoft Office (Word, Excel, access and PowerPoint), among others. This is in agreement with Mwalongo (2011) and Kawade (2012) who revealed that universities use AIMS software which offers the robust functionality to manage the entire academic processes and student life cycle starting from course planning, student enrolment, and class registration to financial aid

information and billing-providing a centralized data warehouse that gives a single source of information to make well-informed financial and operational decisions in real time.

Results indicated that admissions in regard to the, ICT quality software system has streamlined admission processes, quality of student intake and curbed admission fraud. This software can equally be used in keeping academic record of all the data and events in the university and can be retrieved when needed. To buttress the above, Stephen (2013) highlighted that there are many benefits accrue from the use of a quality ICT software in the management of students' academic records includes: The annual student data is organized in a simple and accessible format and translucent and federal management of multi-disciplinary institution can be done easily with the help of AIMS software. Correspondingly, Gürkut and Muesser (2017) revealed that the quality of software for academic information systems should have access control systems to control access to information and computer systems. This defines a set of account management standards that restrict access to un authorised personnel and safeguard the students' academic information and is done mostly by use of passwords.

Findings in chapter four revealed that the quality of ICT Software in Kyambogo University allows growth with the needs of institutional records (mean score = 4.16). The application of ICT provided access to students' database on academic records and indicators to allow policymakers to incorporate evidence-based decision making into their programming. The finding concurs with Lubaale (2012) says that the quality of an academic information system software should be purposely secure and safe to protect an entity's valuable resources. Additionally, Lubaale revealed that through the selection and application of appropriate safeguards, security and safety helps to achieve the organisation's mission by protecting tangible and intangible assets.

The findings also indicated that KyU uses Academic Information Management System (AIMS) platform for managing students' academic records and it is integrated with the University's administrative systems for data exchange. AIMS also provides KyU repository, students Portals to make the University's database publicly accessible. The finding is in agreement with Fardzah, *et.al.* (2010) who earlier indicated that ICT is an important strategic and essential functional requirement for students' academic records management. In the developing world, the use of AIMS is achieving breakthrough in management of students'

academic records. This aids to cater for the increasing student enrollment. Furthermore, on contrary, a study by Quigley (2011) notes that, protection of ICT software quality is a major challenge since the inception of the computer age. Computer files, databases, networking and the Internet based applications all have gradually become part of the most critical assets than before. When these assets are attacked, damaged or threatened, data integrity becomes an issue and the proper operation of the business may be interrupted (Uganda Communications Commission paper on the state of cyber security in Uganda, 2005).

The results of the study indicated that the attributes of KyU software are described as the fitness for purpose and worthwhile for handling students' academic records. The directorate of ICT assessed the reliability of AIMS software to suite the best practices and technical specifications among which included: Application Practices, Coding Practices for students' course units, Complexity of algorithms of students' scores, Complexity of programming practices for each course offered by the student and compliance with programming best practices". KyU lecturers are able to upload students' results for exams, and course works online and they reflect on a students' portal. Before graduation time, students are able to tell whether they have retakes or not and lodge their complaints on time to avoid harassments/embarrassments during graduation. He added that graduation transcripts will also be verified online by employees of people taking on their graduates. The finding is in line with Bogere et. al, (2013) who mentioned that ICT security architecture for the Higher Education sector must meet the following overall quality requirements: adequate protection, established security and risk assessments levels, compliance with the institution's information security policy and other national and international regulatory requirements and agreements with third parties, must be equipped with appropriate capacity and adequate robustness in the event of failure (resilience).

The study findings also indicated that KyU software quality allows regular and reliable students' academic records which grow with student admission, enrollment and registration. This enables policy planning, financial management, university management, make decisions about university personnel (including lecturers, data entrants, registrars) and support for student learning. The finding corresponds with Saiti and Prokopiadou (2009) who earlier established that AIMS software is a computerized application and programme which helps in effective and controlling the running of institutional operations, such as storing, controlling and centralizing all the activities.

The ICT software was user friendly in analyzing and disseminating students' academic information (mean score=4.21). The directorate of ICT is charged with the responsibility of software development and maintenance within the sphere of their skills in partnership with the vendor (ICT service provider), sister institutions or individuals/group of individuals outside the services of the University on agreed contractual terms. This is significant in overcoming or combating difficulties that would arise from protecting the availability of electronically generated information for future use. Specifically, it is difficult to maintain students' academic electronic records when the software quality is compromised. Correspondingly, Katuu (2006) observed that students' academic records stored in the quality software has a longer lifespan contrary to students' electronic records stored in a poor-quality software. Similarly, Bharamagoudar, Geeta and Totad, (2013) evidenced that it easy to store students' academic information and regularly upgrade if the software permits compatibility. Furthermore, Bharamagoudar *et.al.* (2013) reveal that, the quality of software for better management of students' academic information must be secure and safe in terms of providing; Confidentiality, Integrity, and Availability (CIA). Similarly, Chawinga and Zozie, (2016) adds that in the era of computing, Electronic Data Processing (EDP) operations are representative of most computing environments, and information security is basically a technical function.

In addition, the study found out that the quality of software used at Kyambogo University allows update to correct faults and to improve performance (mean score = 4.13). This signified that KyU Software functional quality reflects how well it complies with or conforms to a given design, based on functional requirements or specifications for management of students' academic records. However, the software designs most times does not suit the user needs as some loop holes within the ICT policy framework. The finding is in line with Maere (2011) who established that the implementation of technical controls however always requires significant operational considerations and should be consistent with the management of security within an institution.

### **5.1.3 The relationship between ICT human resources competence and academic records management of Kyambogo University.**

In regard to creating and capturing electronic records accurately, the study established that records staff were knowledgeable in creating and capturing electronic records accurately with a mean score

being 2.69. The study further revealed that the staff involved in records management had the skill for searching/tracking, accessing and retrieving electronic records (mean score=2.76). The implication is that results coordinators had inadequate technical expertise in handling students' electronic academic records within KyU repositories thus imposing errors in to student registration, updating of examination records as well as access and retrieving students' academic records. The finding is in agreement with Abuga (2014) who indicates that several challenges face human resources involved in records capturing, processing, storing, retrieval, preservation and disposal: absence of organisational plans for managing records; low awareness of the role of records management in support of organisational efficiency and accountability; lack of stewardship and coordination in handling records; absence of core competencies in records and archives management; absence of budgets dedicated for records management; lack of records retention and disposal policies; and absence of migration strategies for records.

Results in chapter four revealed that human resources involved in records management at KyU have limited competencies in records management. Results coordinators cannot adequately either create, store, retrieve students' academic records electronically or use them in computerized form for long periods. This is perhaps, due to the fact that management of students records in AIMS presents new and complex challenges to the University as a whole. AIMS service providers need to provide structure, consistency, security, and control over these records. In support of the above finding, Baryamureeba (2010) noted that with the emerging roles of universities to fulfil the evolving global needs as well as the technological advancements, numerous implications in managing students' academic records need fulfilling. For example, there is need not only to employ more ICTs but also records personnel who can manage students' academic records electronically and effectively. Similarly, Maere (2011) recommended the need for competent and skilled electronic records managers as a necessity by institutions of higher learning in this digitalized era.

The study findings revealed that results coordinators at KyU are in position to perform basic equipment maintenance tasks in the electronic repositories (mean score=2.77). The low mean value signifies that staff involved in records management experienced trouble in assisting students in registration, online profiling, recording examination grades, transcript generation, accommodation management and keeping student records. The findings further indicate the other



challenges faced by records staff in relation to academic records capturing and preservation included: absence of records management plan; limited awareness of the role of records management in support of operational efficiency and accountability; poor coordination in handling records; inadequacy core competencies and failure to follow records policies. The finding contravenes earlier studies such as Bantin (2008) who stated that using AIMS as an ICT digital system embraces not only the availability of ICT infrastructure but also the availability of academic records managers in form of human resources able to manage students' information electronically. On the other hand, the findings concur Wamukoya and Mutula (2012s) who established that staff competencies, skills and tools needed to manage students' academic records have not been adequately developed. To make matters worse, Wamukoya et.al. state that at policy level, senior officials and legislators are often unaware of the requirement to manage electronic records over time so that the evidence base of organisation will be secure and accessible when needed by authorized users.

Regarding whether respondents are trained and skilled in basic records appraisal principles and vital records classification in the database programmes, the study established that results coordinators of KyU are not trained and skilled in basic records appraisal principles and vital records classification in the database programmes (mean=2.87). In addition, the study found out that the move to AIMS as an ICT system from excel sheet recording created new skill requirements that need to be addressed as a matter of urgency to protect and preserve the students' academic records as evidence for operations and to protect students' information. Students' academic records management processes at KyU was weak to take into account of workflow, records quantity and formats, and operational needs of the university. Therefore, results coordinators at KyU have inadequate capacity and skill gaps to efficiently and effectively manage students' academic records. The finding is in agreement with Onifade (2012) who revealed that Academic records staff must have the skills to work out strategies of harmonizing the two systems into an effective information delivery. In other words, academic records officers should ensure that paper and electronic records co-exist for some foreseeable future.

The study revealed that the results coordinators of Kyambogo were not regularly trained in academic records management software usage (mean score = 2.27). The study further appreciated the importance of records but noted that poor students record management was compromising

service delivery which has been brought about by low professionalism; poor filing and misfiling students' academic records. This similar scenario was earlier recorded by Suhail, *et.al.* (2014) who opine that poor students' records management results in loss of files and documents leading to delayed services to clients, poor public image, poor reputation, non-compliance, financial loss and information loss.

The findings in table 4.10 showed that ICT human resources competencies had a positive moderate and significant relationship with academic records management of Kyambogo University as indicated by a correlation coefficient of 0.464 and a probability value (0.000) which is below 0.01 level of significance. This implied that improvement in ICT human resources competencies will enhance academic records management of Kyambogo University. The null hypothesis (Ho) is rejected while the alternate hypothesis (Ha) is accepted. This implied that there is significant difference between ICT human resources competencies and academic records management of Kyambogo University.

#### **5.1.4 Academic records management**

Based on the study findings, academic records staff were able to provide quick access to information needs of clients (mean =2.77). This meant that students were impeded from accessing critical information being hard to access and nearly impossible to process their transcripts especially before enrolling, making full payments and registering on the portal. This state of affairs has a negative impact on service delivery because it caused delayed decision-making process. Ineffective management of students' academic records indirectly affects the performance of KyU and may have adverse hamper service delivery. This is contrary to Shepherd (2016) who stated an appropriate records management programme helps the institution to deliver services in an efficient, accountable manner, consistently support managerial decision making and transparent policy formation and ensure continuity in policy execution, management and administration.

Furthermore, the study results showed that at KyU students' academic records were stored in bulk and could be retrieved in a short time (mean = 2.74). KyU uses AIMS as a modern ICT to create, store, and manipulate automatically process testimonials, secure examination results, ease of access and preserve long-term important information, and systematically disposing of students' academic records but records management has not been attained. The study established

that, the university lacked a clear records management policy, consequently; development and implementation of a records management programme and policies to establish formal records management programme with clear policies, infrastructure, staffing, guidelines and clear qualifications for records personnel is recommended.

## **5.2 Summary of the major findings**

### **5.2.1 The effect of the availability of ICT Hardware on academic records management of Kyambogo University**

From the discussion of the major findings above, the University acquired sufficient ICT hardware such as external Hardware at KyU that cover; Mouse, Screen, Central Processing Units, Keyboard, Monitor, Router, Mouse, Scanners, Printers, Digital Cameras and Cd-Rom while on the other hand internal hardware like; Motherboard, Hard disk drive and Random-Access memory (RAM). The availability of adequate ICT hardware at KyU provided support for major functions in regard to management of students' academic records such as input, processing (internal storage, computation and control), output, secondary storage (for data and programs), and communication. In principle, ICT hardware were used at KyU for management of the most pivotal information about students' faculty, courses, applications, admissions, payment, exams and grades.

### **5.2.2 How the Quality of ICT Software affects academic records management of Kyambogo University.**

Based on the study results, the attributes of KyU software are described as the fitness for purpose and worthwhile for handling students' academic records. The directorate of ICT assessed the reliability of AIMS software to suite the best practices and technical specifications among which included: Application Practices, Coding Practices for students' course units, Complexity of algorithms of students' scores, Complexity of programming practices for each course offered by the student and compliance with programming best practice. KyU lecturers are able to upload students' results for exams, and course works online and they reflect on a students' portal. Before graduation time, students are able to tell whether they have retakes or not and lodge their complaints on time to avoid harassments/embarrassments during graduation.

### **5.2.3 The relationship between ICT human resources competence and academic records management of Kyambogo University.**

KyU results coordinators have limited competencies in electronic records management. Results coordinators cannot adequately either create, store, retrieve students' academic records electronically or use them in computerized form for long time. Results coordinators experienced trouble in assisting students in registration, online profiling, recording examination grades, update of retakes and missing marks, transcript generation and keeping student records. The findings further indicate the other challenges faced by records staff in relation to academic records capturing and preservation included: absence of records management plan; limited awareness of the role of records management in support of operational efficiency and accountability; poor coordination in handling students' academic records; inadequacy core competencies and failure to follow records policies.

## **5.3 Conclusions**

The main aim of the study was to investigate on the effect of information communications technology on students' academic records management at Kyambogo University. The research was based on the hypothesis that utilization of ICTs plays a significant role in promoting effective records management compelling quality service delivery. Hence the primary research question was whether the management of records receives the attention it deserves using ICTs at KyU

### **5.3.1 The effect of the availability of ICT Hardware on academic records management of Kyambogo University.**

In a nutshell, KyU had adequate computer hardware available upon which softwares were installed to aid online registration and admissions of students, with online examination results access, student profile and finance as add-ons. KyU uses AIMS with efficient availability of ICT equipments such as desktop computers, laptops, internet access facilitates reduction of rampant missing results.

According to the findings, availability of ICT Hardware positively and significantly influenced students' academic records management of Kyambogo University in that improving in the quality of ICT hardware results into an improvement in the academic records management.

### **5.3.2 How the Quality of ICT Software affects academic records management of Kyambogo University.**

Deriving from the summary of the major findings its inferred from the study results that, KyU has a good AIMS software with desirable quality specifications to allow regular and reliable students' academic records to grow with student admission, enrollment and registration. This allows policy planning, financial management, university management, make decisions about university personnel (including lecturers, data entrants, registrars) and support for student learning. The quality of software for better management of students' academic information was secure and safe in terms of providing; Confidentiality, Integrity, and Availability (CIA).

Above all, the quality of software used at Kyambogo University allows update to correct faults and to improve performance. In conclusion, the AIMS software functional quality reflects how well it complies with or conforms to a given design, based on functional requirements or specifications for management of students' academic records and improving service delivery.

Nevertheless, protection of information remained a major challenge since the beginning utilization of AIMS in KyU. The problem of information protection has become more urgent than ever. Computer files, databases, networking and the Internet based applications all have gradually become part of the most critical assets of an organisation. Encrypting such files at least helps protect institutions with physical security measures, digital rights management systems which prevent unauthorised use. Access Control Systems to control access to information and computer systems, the aim is to define a set of account management standards that will restrict access to authorised personnel and safeguard the services and information. This is done mostly by use of passwords and secret codes.

### **5.3.3 The relationship between ICT human resources competence and academic records management of Kyambogo University.**

Based on the empirical survey findings, it can be concluded that students' records management is not receiving the attention it deserves at KyU. Results coordinators had inadequate technical expertise in handling students' electronic academic records within KyU repositories thus daunting errors into student registration, updating of examination records as well as access and retrieving students' academic records. Therefore, results coordinators at KyU have inadequate capacity and

skill gaps to efficiently and effectively manage students' academic records. poor students record management compromises service delivery due to low professionalism; poor filing and misfiling students' academic records.

## **5.4 Recommendations**

In light of these conclusions, the study advocates for the following interventions as mechanisms of transforming ICTs to superimpose enhanced students' academic records management.

### **5.4.1 The effect of the availability of ICT Hardware on academic records management of Kyambogo University.**

KyU should continue to uphold availability of ICT hardware that suit the security needs of a students' academic records, software compatibility and above all successfully contribute to maintenance of ICT security when integrated as one system in university.

Since most students access the system using ICT hardwares in university laboratories and library internet room, it is recommended that the university to procure more computers hardwares and extend laboratories to other rooms to accommodate the ever-increasing number of students at the campus and curb compound and veranda mobile users.

Accessing WIFI from open space computer laboratories has raised privacy concerns among the students, many students said that most of the times the labs are congested and their friends can easily see the examination results displayed upon logging in into the system. The study therefore, recommends that there should cater for each computer in the university ICT laboratories.

### **5.4.2 How the Quality of ICT Software affects academic records management of Kyambogo University**

KyU should protect sensitive students' academic records in honor of their core values and remain conscious of the way a university works while aiming for systemic changes to ensure confidentiality and integrity of information within the university's operations.

The study recommends that AIMS software should be designed to suit the user needs and to govern all loop holes within the ICT policy framework of the university to prevent unauthorised removal and destruction of records.

The ICT Directorate with financial assistance from the university should upgrade their servers and increase the Random-Access Memory (RAM) of the system to deal with the problem of server loads due to user congestions. At the same time, it is important that registration process should not have deadlines, instead it should be done in phases or else students should start registering when they are at home.

#### **5.4.3 The relationship between ICT human resources competence and academic records management of Kyambogo University**

It is recommended that the Records staff be provided with adequate training to ensure that this officer is able to undertake the full responsibilities of the post. The position of the Records Manager is crucial as this official is entrusted with the responsibility of overseeing the welfare of the KyU academic records. Foreexample officers should be continuously workshopped on how to use the file plan.

Empirical findings revealed inadequate guidance and training of results coordinators on the handling of emailed students results. This may lead to the loss of institutional memory as officials might delete examination results on their local hard drives without thinking that they are public records. Ideally, the results coordinators should be dedicated to records management, so as to completely focus on the records management function.

The staff involved in records management should also be encouraged to subscribe to the professional bodies to be kept abreast about the developments in the field. KyU should further consider providing financial assistance to the results coordinators in this regard, since this will benefit the institution as a whole.

The results coordinators should be supported by competent and well-trained staff. Directorate of human resources and Directorate of information and communication technology should arrange

continuous training sessions for results coordinators, to ensure that they are equipped with knowledge and skills to carry out their duties effectively and efficiently.

The training should encompass all the important aspects for an effective records management programme including; file plan, records management policy and procedure manual, records control schedule and promotion of access to information manual. This can be done through organizing conferences, seminars, workshops, brainstorming among other methods.

### **5.5 Areas of further Research**

Further research should be conducted to explore;

- The relationship between ICT and e-learning in private universities in Uganda
- To investigate the extent to which ICT influences student academic achievement; a comparative analysis of private and public universities in Uganda
- The role of records management in improving accountability in various Ministries in Uganda
- The contribution of records management in fighting corruption in government ministries and agencies
- The importance of training in ensuring sound records management



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## APPENDIX I: QUESTIONNAIRE FOR STAFF

Dear Respondent,

I am Ruth Nalumansi, a graduate Student of Kyambogo University pursuing the degree of Masters of Organization and Public Sector Management. One of the major requirements for the award of the Master’s degree, is to carry out research. My topic of study is “*Information Communications Technology and Academic Records Management at Kyambogo University*”. Kindly feel free to participate in the study by answering questions in the questionnaire as accurate as possible. The information provided shall be treated with utmost confidentiality and will purely be used for academic purposes.

*Thank you in advance for accepting to be part of the study.*

### Section A: Demographic Characteristics of the Respondents

| No. | Bio-data   |  | Please Tick |
|-----|--|--|-------------|
| 1   | Gender   | a) Male  | 1           |
|     |  | b) Female                                      | 2           |
| 2   | Age Bracket  | a) 25-30 Years                                 | 1           |
|     |  | b) 31-35 years                                 | 2           |
|     |  | c) 36-40 years                                 | 3           |
|     |  | D) 41 and above                                | 4           |
| 3   | Education level                                    | Diploma  | 1           |
|     |  | Degree   | 2           |
|     |  | Masters & postgraduate certificates & diplomas | 3           |
|     |  | PHD  | 4           |
| 4   | Working experience in academic records management. | 5 years and below                              | 1           |
|     |  | 6 - 10Years                                    | 2           |
|     |  | 11- 16 years                                   | 3           |
|     |  | 17 years and above                             | 4           |

## Section B: Research Variables

### Information and Communication Technology

This section seeks to establish the availability of ICT hardware, Quality of ICT software and the ICT human resources competencies. Please, Indicate the extent to which you agree with the following observations on the scale of: 1. Strongly Disagree (SD), 2. Disagree (D), 3. Not Sure (NS), 4. Agree (A) and 5. Strongly Agree (SA).

| <u>Scale</u> | <b>1</b>          | <b>2</b> | <b>3</b>  | <b>4</b> | <b>5</b>       |
|--------------|-------------------|----------|-----------|----------|----------------|
|              | Strongly Disagree | Disagree | Undecided | Agree    | Strongly Agree |

|            | <b>Independent Variables</b>  | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
|------------|---|----------|----------|----------|----------|----------|
| <b>No.</b> | <b>Availability of ICT Hardware</b>   |          |          |          |          |          |
| 1          | KyU has desktop computers used for data capturing   |          |          |          |          |          |
| 2          | KyU has enough Laptops to reduce rampant missing results.   |          |          |          |          |          |
| 3          | My computer has sufficient memory to store data   |          |          |          |          |          |
| 4          | My computer can process data faster   |          |          |          |          |          |
| 5          | KyU has adequate computer monitors to provide data output for information display   |          |          |          |          |          |
| 6          | KyU has sufficient printers that provide large volume printing as well as priority to the best quality and clarity output |          |          |          |          |          |
| 7          | KyU has necessary hard disks drives for storage and retrieval of digital data   |          |          |          |          |          |
| 8          | All the other computer accessories of my personal computer work together for proper running of the computer.              |          |          |          |          |          |
|            | <b>Quality of ICT Software</b>  |          |          |          |          |          |
| 9          | I believe that the quality of ICT Software is dependable as it helps KyU uphold integrity of academic records             |          |          |          |          |          |
| 10         | Our ICT software is user friendly in analysing students' academic information   |          |          |          |          |          |



|    |  |  |  |  |  |  |
|----|--|--|--|--|--|--|
| 11 | I use ICT software to facilitate students' overall quality admissions into university                                  |  |  |  |  |  |
| 12 | The quality of ICT Software allows growth with the needs of institutional records.                                     |  |  |  |  |  |
| 13 | KyU software permits encrypting of students' files against unauthorized use.   |  |  |  |  |  |
| 14 | KyU ICT software provides secure web applications for academic records   |  |  |  |  |  |
| 15 | The Kyu ICT software provides richer user interface  |  |  |  |  |  |
| 16 | KyU software quality allows update to correct faults for improved performance  |  |  |  |  |  |
|    | <b>ICT Human Resources Competencies</b>  |  |  |  |  |  |
| 17 | I am knowledgeable in capturing electronic records accurately  |  |  |  |  |  |
| 18 | I have the skill for retrieving electronic records   |  |  |  |  |  |
| 19 | I uphold data entry specifications procedures to ensure integrity of the students' information                         |  |  |  |  |  |
| 20 | I hold the potential to store students' data using established ICT formats to communicate results effectively          |  |  |  |  |  |
| 21 | I am able to perform basic equipment maintenance tasks in the electronic repositories                                  |  |  |  |  |  |
| 22 | I am trained and skilled in basic records appraisal principles of records classification in the database programmes.   |  |  |  |  |  |
| 23 | I am trained on quality control procedures when analyzing data to identify discrepancies in bulk students' information |  |  |  |  |  |
| 24 | I am experienced to handle students' records following the generally Accepted Recordkeeping Principles                 |  |  |  |  |  |
| 25 | I am regularly trained in academic records management software usage   |  |  |  |  |  |

### Academic Records Management

This section seeks to determine the level of academic records management. Please Indicate the extent to which you agree with the following observations on the scale of: 1. Strongly Disagree (SD), 2. Disagree (D), 3. Not Sure (NS), 4. Agree (A) and 5. Strongly Agree (SA).

| <u>Scale</u> | 1   | 2        | 3         | 4     | 5              |          |          |          |          |
|--------------|---|----------|-----------|-------|----------------|----------|----------|----------|----------|
|              | Strongly Disagree   | Disagree | Undecided | Agree | Strongly Agree |          |          |          |          |
|              | <b>Academic Records Management</b>  |          |           |       | <b>1</b>       | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
|              | <b>Easy &amp; Rapid Access</b>  |          |           |       |                |          |          |          |          |
| 1            | I am able to provide quick access to information needs of clients                               |          |           |       |                |          |          |          |          |
| 2            | I do regular filing of records to enhance speedy access to information                          |          |           |       |                |          |          |          |          |
| 3            | I provide access to academic records for quick decision-making                                  |          |           |       |                |          |          |          |          |
| 4            | I perform systematic indexes to facilitate records' easy retrieval.                             |          |           |       |                |          |          |          |          |
| 5            | I conduct records scheduling for easy access to personal data                                   |          |           |       |                |          |          |          |          |
|              | <b>Timely completion of tasks</b>   |          |           |       |                |          |          |          |          |
| 8            | I am able to provide students results with progress reports on time                             |          |           |       |                |          |          |          |          |
| 9            | It takes me a shorter time to capture and update students' academic records in the system       |          |           |       |                |          |          |          |          |
| 10           | I can retrieve students' academic records in the shortest time possible                         |          |           |       |                |          |          |          |          |
| 11           | Students academic records stored in bulk can be achieved in a short time                        |          |           |       |                |          |          |          |          |
| 12           | I disseminate students' academic records to those concerned in the shortest time possible.      |          |           |       |                |          |          |          |          |
|              | <b>Operation Precision</b>  |          |           |       |                |          |          |          |          |
| 13           | I hold students' academic records to allows accurate processing of transcripts and certificates |          |           |       |                |          |          |          |          |
| 14           | I manage records in proper ways to prevent loss or missing of records;                          |          |           |       |                |          |          |          |          |
| 15           | I monitor usage for record-keeping system maintenance   |          |           |       |                |          |          |          |          |

|    |   |  |  |  |  |  |
|----|---|--|--|--|--|--|
| 16 | I enforce compliance with key records management functions and requirements   |  |  |  |  |  |
| 17 | I can identify areas requiring improvement with regard to desirable best practices  |  |  |  |  |  |
| 18 | KyU records management provides self-evident information (e.g. who created it, when, to whom was it sent, why) to enable records useable over time. |  |  |  |  |  |
|    | <b>Task Control &amp; Flexibility</b>   |  |  |  |  |  |
| 23 | Academic Records Management at KyU permits update of students' information  |  |  |  |  |  |
| 24 | Academic Records Management enables encryption to improves records safety   |  |  |  |  |  |
| 25 | Authentication of students' academic documents after they have left the institution is done easily  |  |  |  |  |  |
| 26 | Proper records management has enhanced legal suits  |  |  |  |  |  |
| 27 | Financial accountability and accurate reporting enhanced through proper records management  |  |  |  |  |  |

***“Thank you for your Cooperation”***

## APPENDIX B: INTEVIEW GUIDE FOR KEY INFORMANTS

Dear respondent,

I am a student at Kyambogo University undertaking a study on “*Information Communications Technology and Academic Records Management at Kyambogo University*”. The study is in partial fulfillment of the requirements for the award of the Master of Organization and Public Sector Management degree. You have been identified as one of the people who can provide important information. I kindly request you to answer the questions sincerely and accurately. The information will only be used for academic purposes and it will be treated with maximum confidentiality.

*Thank you for your kind cooperation.*

1. What ICT Hardwares are available at Kyambogo University?
2. What is the relevancy of ICT hardware in regard to students’ records management at KyU?
3. What is the effect of availability of ICT hardware on academic records management of Kyambogo University?
4. What ICT software were acquired to aid in implementation of AIMS at Kyambogo University?
5. What is the importance of ICT software in the management of students records at KyU?
6. How does the effectiveness of ICT software affect academic records management of Kyambogo University?
7. To what extent does ICT human resources competence affect academic records management of Kyambogo University?
8. What challenges do human resources face in managing academic records at Kyambogo University?
9. What strategies can be adopted to improve academic records management of Kyambogo University?

*“Thanks for your participation”*