THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGY AND THE MANAGEMENT OF KYAMBOGO UNIVERSITY: A CASE STUDY

BY

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DECLARATION

I, BILALI Athmani, hereby declare that this thesis is an original academic write-up. It has never been written and, or presented to Makerere University, or any other university or tertiary institution for an academic award.

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Date:-----

APPROVAL

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This thesis has been found to conform to the requirements set out in the University's guidelines for award of Doctor of Philosophy degrees and is hereby submitted for examination with our approval as University Supervisors:

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DEDICATION

To Professors Martin E. Amin and Sam O. Owolabi for distinguished scholarship.

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ABSTRACT

The investigation sought to establish the relationship between the use of Information and Communication Technology (ICT) and the management of Kyambogo University. The descriptive survey was used as research design with sample survey technique to collect data from the sampled respondents.

The objectives of the study were to: determine how the availability of ICT equipment and infrastructure in Kyambogo University affects the management of the University; ascertain how the use of ICT in Kyambogo University affects the management of the University; identify how the levels of ICT in use in Kyambogo University affect the management of the University; ascertain how the maintenance of ICT equipment and infrastructure of Kyambogo University affects the management of the University; investigate how the attitude of users of ICT towards ICT applications affects the management of Kyambogo University. The target population consisted of 98 staff and 4,502 resident students of Kyambogo University. The study sample included 18 management staff, together with 80 academic staff purposively selected and 450 students, who were systematically chosen. The following data collection methods were used: Documentary review to identify historical perspective of the research; and selfadministered questionnaires, together with face-to-face personal interviews to accommodate different types of respondents.

The major findings of the study were that: The availability of ICT equipment and infrastructure, together with the levels of ICT applications in use, as well as maintenance of ICT equipment and infrastructure in Kyambogo University, negatively affected the management of the University.

Based on the findings, the following recommendations were put forward:

- Kyambogo University should review its ICT policy for both managerial and academic activities of the University from the perspective of availability for use of ICT equipment and infrastructure.
- The University should also re-design and develop appropriate levels of ICT applications in use to support teaching, research, and learning activities in the academic units; and managerial and administrative operations in the management and finance units.
- A programme of maintenance and service of the ICT equipment and infrastructure should be designed with frequency and sustainability in consideration.

- Tendencies of stress and anxiety on the ICT applications among the users, could be controlled by Kyambogo University through in-house sensitisation, counseling and re-tooling sessions to enable staff and students cope with the demands of the technology.
- This study should be replicated in another university in Uganda with a variation in the identification of independent variables, sampling methods, analysis of the findings and selection of another management theory on which to base the study.

CHAPTER ONE

INTRODUCTION

BACKGROUND TO THE STUDY

This study focuses on how the use of Information and Communication Technology (ICT) is related to the management of Kyambogo University. Chapter One presents the background to the study. In it, the historical, theoretical, conceptual and contextual perspectives are considered. The problem of the research is stated and purpose as well as the objectives of the study is then presented. These objectives are again posed as research questions and matching hypotheses are formulated. Finally, the scope and the significance of the study are briefly outlined.

Historical Perspective

In 1992, Uganda had no national policy on higher education and lacked systematic planning in the institutions of higher learning. This scenario resulted in the haphazard development of the institutions of higher learning as reflected by the poor state of facilities, together with the deterioration of quality of higher education. This called for the need to streamline the management of the institutions of higher learning to make them more effective, efficient and capable of serving the dynamic needs of the country. A Government White Paper was therefore developed to provide the road map for the development of institutions of higher learning in Uganda (MoES, 1992).

Following the development of the Government White Paper, The Universities and Other Tertiary Institutions Act of 2001 was enacted to streamline management and administration of the universities and other tertiary institutions in Uganda. The Act stipulates that Uganda's university system consists of both public and private universities.

By the year 2005, there were four public universities and 16 private ones in the country (The Uganda Higher Education Review, 2005). The fifth public university (Busitema University) started operations in the academic year 2007/2008. This scenario depicts growth in the number of universities and calls for strategic management of the institutions of higher learning through application of ICT as a vehicle of effectiveness and efficiency (Liang, 2001). The Proposed Strategic Plan for Higher Education 2003 – 2015 (2003) however, reveals that limited ability to process, store, disseminate and access information between the MoES and the institutions exists and therefore there is need to develop strategic management to revitalise the quality of education. In pursuance of the strategy to revitalise the quality of education, the Ministry of Education and Sports in 2001 and 2002, undertook studies of the Irish, Japanese and South Korean higher education systems, with the following objectives, among others:

- To study the functions of higher education systems.
- To study how higher education systems were planned and structured to enhance development.
- To observe and study ICT applications in higher education.
- To study general management of higher education.

With a view to consolidation of strategies to provide qualitative education and sports to the Ugandan community, the Ministry of Education and Sports in March 2005, developed the Education Sector Strategic Plan (ESSP) 2004 – 2005, succeeding the Education Strategic Investment Plan (ESIP) of 1998 – 2003 (MoES, 2005). The purpose of the Plan was:

- To enable the Ministry of Education and Sports fulfill its mission of " supporting, guiding, coordinating, regulating and promoting quality education and sports to all persons in Uganda for national integration, individual and national development" (MoES, 2005).
- To guide the entire Ministry's sub-sectors in their regular medium-term and annual planning and budgeting processes.
- To facilitate the Ministry of Education and Sports, as sector coordinator in negotiating with other Government agencies and other players in the management of education and sports.

The ESSP further provides the following strategies to achieve the objectives:

- The Ministry of Education and Sports in collaboration with the newly established National Council for Higher Education (NCHE), have developed a strategic plan for higher education to address the challenges of realising expanded and equitable participation in a coordinated, flexible and diversified tertiary education system.
- Preparation of the graduates to be innovative, creative and entrepreneurial.

Citing the Proposed Strategic Plan for Higher Education (2003), the ESSP provides that public investment in higher education should be returned to the society in the form of productive participation in private enterprises and public service. The argument advanced for this strategy is that only 2.7% of Uganda's youth between the ages of 19 and 25 years are enrolled in the institutions of higher learning, yet the demand for access to higher education exceeds what is provided. Hence, Nakanyike (2002) reports that this rate of growth of student numbers exhibits a trend of few Ugandans attaining higher education.

Concurring with ESSP and Nakanyike, the International Institute for Educational Planning (IIEP), the Association of African Universities (AAU) and the Association of Education in Africa (ADEA) in a Forum for Higher Education, revealed that private institutions of higher learning are an emerging sector and a very fast-growing segment of higher education in many African countries, intended to supplement the provision of higher education (The ADEA) Newsletter, 2004). The Forum further revealed that the rapid expansion was evident through the privatisation movement and the impetus given by those in the private sector and also strongly felt that there was need to regulate the growth of the sector with a view to making it more complimentary to the public higher education sector. The regularisation can be effectively and efficiently implemented through linkages between the public and private institutions of higher learning.

The West African scenario as presented by ADEA (1999) reveals that universities' networking system exists in Nigeria and provides electronic linkages for academic and research collaboration arrangements (The Nigerian Universities Network. [NUNET], 1999). As at December 1999, 18 out of 29 federal universities were connected through dial-up-e-mail facilities. The Ugandan scenario however, contrasts with the Nigerian one (MoES, 2005) as exhibited by the policy reform of 2005 that was formulated to address the imbalance in equity and access to higher education, in which a provision was made for sponsorship by Government of admissible students to gain access to the public universities. The reform was the introduction of the Quota System for the admissible students to public universities and was to award quotas of admission to districts, disabled persons and persons who have excelled in games and sports. The policy reform however, did not include ICT component for effective and efficient management of the system.

The Graduate Workshop at Makerere University (2003) noted that ICT in the universities is faced with challenges that include:

- Erratic power supply.
- High connectivity costs.
- Technological constraints viz: inappropriate band-width of connectivity cables.
- High accessibility costs to electronic data.
- Inadequate effectiveness and efficiency administration.
- Lack of transparency.
- Lack of good capacity building practices.
- Lack of innovative applications.
- High sustainability costs.
- Lack of gender equity.

The current document of Education Information Management System (EMIS) that is available for the use of the Ministry of Education and Sports provides only statistical information related to Primary and Teacher Education sub-sectors (Academy for Educational Development, AED, 1999:10). The EMIS document provides no information on higher education, contrary to. Kasozi (2005) argument that the management of Uganda's higher education system should be differentiated, flexible, integrated and responsive to the training for work-skills that are needed in the domestic and global markets. He further argues that if Uganda's higher education is to be seen as relevant to the citizens, surgical reforms are necessary in the curricular design, development and delivery as well as in the way higher education is managed. He also mentions bridging of the digital gap (i.e. ICT concept) as one of the interventions to address the policy reforms. The project strategy to strengthen management and training in the five Uganda's technical colleges with ICT mediation, embraces Kasozi's view (Netherlands Organisation for International Development in Higher Education, NUFFIC, 2006). The strategy is intended to improve the quality and efficiency of technical education through strengthening of ICT in the management and administration processes.

Prasad (1989) perceives Management Information System (MIS) to be the life hood of an organisation in its management operations. He submits that with the increasing use of electronic devices, notably, the computer, a great deal of attention has been given to the designing, development and operationalisation of information systems to disseminate relevant information to managers to support their managerial activities.

Prasad's submission concurs with Maicibi's (2003:62) who while citing Thompson (1999:30) reports that an electronic mail system as a method of organisational communication, benefits an organisation in terms of facilitating fast relaying of information and also cuts down on paper work. To adopt this idea of electronic mail system as a method of organizational communication, Kyambogo University built and maintains an ICT system in the study, teaching and research programmes (Kyambogo University, 2003). The University in this aspect revealed that work on the introduction and popularisation of ICT as a vehicle of study, teaching and research activities started in 2003. Liang (2001:2), with reference to the Ugandan university system, as stipulated in the Universities and Other Tertiary Institutions Act of 2001, suggests alignment of management of the universities to the existing structure to cope proposal with the steady growth of the university numbers, a suggestion that concurs with Kasozi's (2002) proposal that coordination within the system through ICT-mediated management will be necessary for effectiveness and efficiency although he notes that there is limited ability to process, store, disseminate and access information between the MoES and the universities. Ideally, public universities ought to create, process, store and disseminate information related to their activities to the MoES and other stakeholders through effective and efficient media (Ocitti, 1997). Kyambogo University is not an exception.

Theoretical Perspective

This study was guided by Max Weber's bureaucratic theory (Weber, 1947); Ludwig von Bertalauffy's systems theory (von Baterlauffy, 1956); and Lawrence & Lorsch's contingency approach to management (Lawrence & Lorsch, 1967) as possible theories to be linked to the study. According to Warham (1975), formal organisations, Kyambogo University inclusive, have to be administered by either a rule of thumb or in line with an elaborate set of written instructions, derived from theories of management. Management theories are sets of ideas upon which the art or science of management is based (Hodgetts, 1990;Prasad, 1989). The first proponent of bureaucratic management theory (1930-1950) was Max Weber. It is a model also known as efficiency in organisational design, whose main focus is on the structure of the

organisation. Its main aim is to enable objectives of the organisation to be accomplished with minimum expenditure in terms of human and financial resources. Warham (1975:21-23) reveals that the theory was formulated by Max Weber (1864-1920) to be used in the management of organisations with massive administrative duties by systematically coordinating the work of the many individuals. The author further highlights characteristics of a bureaucratic organisation as: division of work and distribution of duties to all the workers; existence of formal hierarchy in the administrative machinery; application of rules and regulations; subordination of individual interests to the official business; and remuneration of workers according to qualifications and experience.

With reference to Warham's assertiveness, Prasad (1989) concurs with her but adds that communication is also a critical characteristic of bureaucratic theory, a concept that has a component of information management system. From strategic management point of view therefore, the application of management principles in a management setting, prevents confusion and an unneccesssary costs in an organisation (Kigongo-Bukenya, 1998). Bureaucratic theory therefore, seems to provide a link between ICT functionality and management, which was the gist of this study.

Another possible theory identified for this study is the systems theory of management put forward by Ludwig von Bertalauffy (1956). The systems concept suggests working together of a set of inter-dependent units in order to respond to forces in their environment and preserve the units (Owolabi, 2005:53-54). This is to say, that a system consists of a set of inter-dependent parts that interact with each other in order to perform one or more functions. It is the sum total of parts working independently and working together to achieve required results. A university is a system of social interaction. It is distinguished from its environment by a clearly defined boundary and its elements (sub-units) are interacted within relatively stable patterns (equilibria) of social order. According to Owolabi (1987: 18), the educational system, like any other social system, involves inputs, process (conversion), outputs and feedbacks. This theory therefore, like the Bureaucratic theory, seems to provide a link between ICT use and management, which was the gist of this study.



Figure 1: The Input-Output Model of the Education System Source: Owolabi, S.O. (1987: 18). Political and cultural context of educational planning

The environment under which a university operates normally consists of the students (clients), the lecturers and the administration. The university receives inputs (human, physical, and symbolic), processes them through the manipulation of such elements of management as Planning, Organising, Staffing, Directing, Controlling, Reporting and Budgeting (POSDCORB), with communication playing a vital role of mediating the manipulation, so as to realise desired outcomes.

Contingency or situational theory is yet another management theory relevant to this study. Kreitner (1995) presents that the scenario of a contingency approach to managing an organisation must be guided by two factors; namely: the environment or state uncertainty within which the organisation operates; and the constituency of the organisation's structural characteristics. According to Fielder (1967), the methods that are highly effective in one situation do not sometimes work in others. This is often so because situations differ. In real life management then, the success of any given approach is dictated by the situation. Formally defined, the contingency approach is an effort to determine, through research, which management

practices and techniques are appropriate in specific situations. The contingency theory cautions us to be aware of the complexity in every situation and take an active role in trying to determine what would work best in each case. The theory also leads us to study how best, organisational sub-systems can interact with each other to produce desired results.

The relevancy of the contingency theory for domestication by members of the Dakar Framework for Action for Education for All, was adapted during the framework's Conference in Dakar in 2000, where a link to contingency theory was presented as: Member countries that attended the Framework pledged among other things, to ensure the engagement and participation of civil society in the formulation, implementation and monitoring of strategies for educational development. (The Dakar Framework for Action for Education for All, 2000).

According to Prasad (1989:75), this theory adds to

the paradigm of modern management theory and is an extension of systems theory. Brown (1960) asserts that effectiveness and efficiency in management are determined by the use of relevant instruments, people and communication. This theory therefore, like bureaucratic and systems theories, seems to provide a link between ICT functionality and management, which was the gist of this

study.

Conceptual Perspective

The conceptual perspective of the investigation consisted of the following variables: Information and Communication Technology; Management; Education; Higher Education; University; and University System, whose definitions have been given according to the concept of the study.

Uganda's policy of provision of quality education is corroborated and supported by the World Bank (2002) in its assertion that quality education delivery must stem from institutional activities mediated by ICT connectivities, the ICT being the electronic means of creating/capturing, storing, disseminating for use information (Mukooyo, 2003). Mukooyo elaborates that ICTs are based on the digital information and need computer hardware and software, together with networks to be created, stored, disseminated and accessed. According to the Networked Readiness Index however, Uganda in 2005, was ranked 77th out of 104 countries in the global ICT index (Information network-Uganda, 2005). This scenario presents Uganda's participation in ICT activities as very weak. The Networked Readiness Index is a technique used to measure the propensity for countries to exploit opportunities offered by the ICT. Bilali (2003:9) asserts that the quality parameters for effective and efficient management include not only formulation and setting standards for entry requirements for students and appointment of academic and non-academic staff, curriculum management, formulation of strategic management plans but also use of ICT in the activities of the universities.

Inyaga, (2002:1) concurs with this concept and refers to ICT while citing Beckman (1982:53) as "the science that investigates the property and behaviour of information, the forces governing the flow of information and the means of processing information for optimum accessibility and usability. The process includes the origination, dissemination, collection, organisation, storage, dissemination, retrieval, interpretation and use of information."

ICT is the electronic means of creating or capturing, storing, disseminating and accessing information for use (MoES, 2005). The technology consists of equipment and infrastructure, the former being computer pieces, together with peripherals while the latter includes the basic systems and services necessary for the establishment of Information and Communication Technology. Information and Communication Technology cannot be dispensed from a computer: A computer as element of ICT is a tool, which operates by taking in raw data and converting them into information. The process of conversion entails isolation of facts and relating them to one another. A computer is also defined as a system of hardware and software used to transform and store information based on the instructions of the user. The following characteristics

enable the computer to perform its tasks:

- The computer is capable of performing more than 50,000 manipulations per second in terms of speed.
- The computer is capable of performing routine tasks repetitively without errors, a characteristic that exhibits diligence.
- The computer has ability to store programmes in its memory and therefore process tasks independent of human intervention.
- The computer achieves high degree of accuracy during its operations.
- The computer is capable of performing almost any kind of tasks provided the said tasks are reduced into logical steps, thus exhibiting versatility.

Information and Communication Technology is also associated with information and communication system, which ARSO-DISNET (1988: 18) (African Regional Organisation for Standardisation Network) refers to as: The activity which consists of communicating, transmitting to others an element of knowledge on a given subject, as well as that element itself which, in any given field of knowledge modifies ignorance, rectifies a lack of

understanding, reduces uncertainty or increases ... it.

Various categories of information constitute information system and Spirack (1978:33) defines information system as "a collection of data or information, records or elements of some sort and the means of acquiring, organising and retrieving otherwise processing them for use".

ICT aspects of availability of equipment and infrastructure, use of ICT in the management of Kyambogo University, levels of ICT applications in use in the management of Kyambogo University, maintenance of ICT equipment and infrastructure and the management of Kyambogo University and attitude of users of ICT towards ICT applications in the management of Kyambogo University, were investigated in terms of use to establish how they related to the management of the University.

Like other professions, management is a field of specific knowledge. The term can be defined in several ways: Management means managing people, i.e. human beings (Kreitner, 1995). Management can also refer to the art or science that one may employ to cause people do what one wants them to do (Kigongo-Bukenya, 1998).

Follet (1916) meanwhile defines management as the art of getting things done through people, whose modification made later referred to management as the art of getting things done through and with other people in formally organised groups.

Urwick and Gullick (1937) define management in terms of what managers do, by coining the acronym POSDCORB, which stands for Planning, Organising, Staffing, Directing, Controlling, Reporting and Budgeting, all of which constitute elements of management. The operationalisation of these elements enable the accomplishment of organisational activities through management process.

Essentially, management is the process whereby the organised resources of human, equipment, materials, money, time and space are related and integrated into a total system to accomplish organisational set objectives (Kigongo-Bukenya, 1998).

Koontz and Weihrich (1990) refer to management as "the process of designing and maintaining an environment in which individuals working efficiently together in groups, accomplish selected aims".

In concurrence with Urwick and Gulick, Koontz & Weihrich claim that:

- Managers carry out the functions of POSDCORB.
- Management is universally applicable to any type of organisation.
- The definition includes all managers at all levels within the organisation's hierarchy.
- The aim of all the managers is the same, i.e. to achieve the organisational set goals.
- Managing entails production of goods and, or provision of services, implying there must be effectiveness and efficiency in the managerial process.

The study aspects exhibited under POSDCORB as an acronym, together with the universal application of management to any organisation, render the aspects under POSDCORB relevant to the concept of the study. ICT could facilitate the planning, organising, staffing, directing, controlling, reporting and budgeting processes of Kyambogo University.

Education is not only a human right but also a vital tool for minimising poverty, promoting health, improving governance and empowering people to make choices about their destinies (International Institute for Education Planning, 2006:3). In the Ugandan context, Education has three levels, namely: First Level, or Primary, Second Level, or Secondary and Third Level, or Tertiary (Ministry of Education and Sports, 2002). According to Bakunda & Walusimbi-Mpanga (2005) the term "higher education" is interchangeably used to refer to "university education" and, or "tertiary education".

The Ministry of Education and Sports (MoES, 1989:72) defines university education as post-secondary system of formal education. The universities, together with "Other Tertiary Institutions" constitute Higher Education level.. The Report of the Education Policy Review Commission of 1989 and the Government White Paper of 1992, define Higher Education as the post-secondary system of formal education, particularly after the Uganda Advanced Certificate of Education. The Uganda Advanced Certificate of Education marks the end f the Second Level of Education at the sixth year of secondary Education. The Higher Education institutions that include universities and other tertiary institutions, provide academic, professional and vocational education. They offer programmes of study that led to the award of certificates, diplomas and under-graduate and post-graduate degrees. In
addition, the universities in Uganda do also provide programmes for conduction of Basic and Applied Research and publication of research findings and undertake out reach activities.

Within the concept of development, higher education is critical for enhancing people's capabilities, furthering equity and promoting social progress (The World Bank, 2002). The MoES (1998), in corroboration with the World Bank mentions provision of public service as the third element among the basic missions of a university, majorly participation in practices that include; provision of high calibre manpower, consultancy, research and development, board membership, public lectures and participation of students and academic staff in development projects and activities.

Another source describes university education as an apex of any formal educational system perceived to be an epitome of excellence in learning, scholarship and service. Bilali (2003:1) defines a university as an institution that promotes and disseminates advanced learning, confers undergraduate and postgraduate degrees and awards diplomas and certificates and is engaged in research and publication. The UNESCO (1998) corroborates this presentation and reports that one of the basic missions of a university system in particular and higher education in general, is the advancement of knowledge and creation of new knowledge, attained through study, teaching, research and publication.

Ocitti (1994) describes a university in terms of concept and system. As a concept, he refers to a university as an institution for the promotion of

advanced learning; a centre of research; and a business centre for generating money. He further presents a university as an institution of higher learning associated with generation and promotion of universality of knowledge and in pursuit for the truth.

A university system in terms of variables consists of inputs, processes and outputs, a concept corroborated by Owolabi (1987) and Nkata (2005). Inputs consist of clients that include students, staff, resources that include money, materials and physical facilities and infrastructure; and quality or characteristics that enable a university to operate effectively and efficiently as a constituency of students and staff. Processes are variables in a university system that include knowledge generation, dissemination and application, and elements of management which are planning, organising, staffing, directing, controlling, reporting and budgeting The outputs in a university system are those who successfully complete their programmes of study (Owolabi, 2006:339). The successful completer, may or may not be able to perform satisfactorily in public life.

Outcome is another term used to refer to the external effects of college output. This is the ability of the college outputs to be socially and economically productive. Here, the frame of reference is external to education. Outcome refers to external efficiency. Efficiency is the optimal relation between inputs and outputs. There are two dimensions to efficiency: We have internal as well as external efficiencies. The flow of students (college students, for example) through the educational system with a minimum of waste of "student-years" is known as internal efficiency. It has nothing to do with the level of skills acquired or knowledge gained. An internally efficient university system is one, which turns out university system graduates without wasting any studentyear. Cumulative repetitions add more to the student-years and makes a university system to become internally inefficient.

On the other hand, an internally efficient university system may be turning out graduates who are unacceptable to prospective employers; they may be morally bankrupt, anti-social or uncultured. When the level of education imparted at the university level is so poor that the outputs cannot perform as expected in the society, we say the system is externally inefficient. The degree to which the education of university outputs is adapted to the needs of the economy and the society, is what we refer to as the external efficiency. The Efficiency of tertiary education incorporates these two dimensions of efficiency, according to Owolabi (2006). While relating higher education to globalisation, King (2003:17) asserts that universities are key to justification for the reform in higher education for the maintenance and enhancement of national comparative advantage in an increasingly economically competitive world. He names research and teaching performances as basic factors for the success in the creation of reforms for effective and efficient management. This assertion concurs with the UNESCO's (1998) and is corroborated by the Uganda Government's policy, which acknowledges the importance of provision of quality education as an outcome of effective and efficient management (MoES, 1998:1).

Contextual Perspective

The study assumed that Kyambogo University was an organisation with functions to undertake. The functions of Kyambogo exhibited it as an organisation (Universities and Other Tertiary Institutions Amendment Act, 2003). It was service-oriented; it provided services in the form of teaching and research to the admitted students. Besides, the University made provision for the advancement, transmission and provision of knowledge and stimulates intellectual life in Uganda.

The University was made up of different departments, which included: Administration and Finance unit; Academic Faculties: Arts and Social Sciences; Education; Special Needs Education and Rehabilitation; Sciences; Engineering; and Vocational Studies; and Library equipped with computers and inter-linked with Internet connectivities as vertical differentiation principle of organisation, where the Vice Chancellor was at the top while support staff was at the bottom, was followed.

Kyambogo University seemed to have an ICT system as exhibited by the availability of computers and Internet connectivities (Kyambogo University, 2005). There was however, no evidence that the system was used in the management of the University.

STATEMENT OF THE PROBLEM

The Education Review Policy Commission (1989) recommended the establishment of Kyambogo University through the merger of The Institute of Teacher Education (ITEK), Uganda Polytechnic Kyambogo (UPK) and Uganda National Institute of Special Education (UNISE), with quality and equity in consideration. The Review Commission pointed out that Kyambogo University would combine teacher education, business studies, together with technical as well as technological education and science, to meet the quality and equity aspects of university education. In the light of the recommendations of the Review Commission, Kyambogo University would fulfill the requirements and expectations of the Commission if ICT were used in the management of the University so that administrative and academic activities of the University's operations would be performed well. Furthermore, the Report of the Visitation Committee to Public Universities (2007: 24) advised Kyambogo University to devise plans to use ICT in the teaching activities.

In concurrence with the recommendations of the Education Policy Review Commission, together with the report of the Visitation Committee to Public Universities, the Universities and Other Tertiary Institutions Amendment Act (2003) stipulates that development of ICT to solve social, economic and educational problems was one of Kyambogo University's objectives. According to the Act, the educational problems that ICT should address include: provision of quality education; establishment of ICT resource centre to support study, teaching and research activities; curriculum designing, development and delivery to admitted persons; conducting examination and award of qualifications; undertaking research and publication aligned to curricular programmes; and supervision of constituent colleges consisting of the National Teachers' Colleges (NTCs) and Primary Teachers' Colleges (PTCs).

Kyambogo University in particular, has an ideal situation of a functional ICT would depict adequate availability of ICT equipment and infrastructure; use of ICT in the management of the university; high levels of ICT applications in use in the management of the university; maintenance of ICT equipment and infrastructure; and positive attitude of users of ICT towards use of ICT in the management of the university.

There were some ICT equipment and infrastructure at Kyambogo University, but it was not clear whether they were sufficient in quantity to make any significant impact nor was it clear on how the use of this technology was linked to the management of this University (Kyambogo University, 2002:2). Unless the use of Information and Communication Technology is linked to the planning, organising, staffing, directing, controlling, reporting and budgeting activities as aspects of management in the University, some of the objectives stipulated in the Act, and listed in paragraph 1 above, may not be achieved. Furthermore, the advice given to the University by the Visitation Committee may not also be addressed. If the POSDCORB are supported with ICT, the result of operations of managerial and academic activities will be produced faster and better. The questions now begging for an answer are, how is the use of ICT, as envisaged in the Act and advised in the Visitation Committee Report, actually linked to the management of Kyambogo University? Are the ICT equipment and infrastructure available in sufficient quantity to make an impact on the management of Kyambogo University? This study is therefore intended to serve as a formative evaluation of the bold plan to develop a functional ICT for the management of Kyambogo University.

PURPOSE OF THE STUDY

The study examined the impact of the use of ICT on the management of Kyambogo University.

OBJECTIVES OF THE STUDY

- To determine how the availability of ICT equipment and infrastructure in Kyambogo University affects the management of the University.
- To ascertain how the use of ICT in Kyambogo University affects the management of the University.
- To identify how the levels of ICT in use in Kyambogo University affect the management of the University.
- To ascertain how the maintenance of ICT equipment and infrastructure of Kyambogo University affects the management of the University.
- To investigate how the attitude of users of ICT towards ICT applications affects the management of Kyambogo University.

RESEARCH QUESTIONS

- How does the availability of ICT equipment and infrastructure affect to the management of Kyambogo University?
- How does the use of ICT in Kyambogo University affect the management of the University?
- How do levels of ICT applications in use affect the management of Kyambogo University?
- How does the maintenance of ICT equipment and infrastructure affect the management of Kyambogo University?
- How does the attitude of users of ICT towards ICT applications affect the management of Kyambogo University?

HYPOTHESES

- Availability of ICT equipment and infrastructure at Kyambogo University affects the Management of the University.
- Use of ICT in Kyambogo University affects the Management of the University.
- Levels of ICT applications in use affect the Management of Kyambogo University.
- Maintenance of ICT equipment and infrastructure of Kyambogo
 University affects the management of the University.
- Attitude of users of ICT towards ICT applications in Kyambogo University affects the management of the University.

SCOPE OF THE STUDY

Geographically, the study was conducted at Kyambogo University and the sample was drawn from the administrative and academic staff of the University, as well as students, while contextually, the study investigated the relationship between use of ICT and the management of Kyambogo University and the methodology used being cross-sectional survey research design.

SIGNIFICANCE OF THE STUDY

Significance of the study is expected to manifest itself in the following scenarios:

- The study is an applied research that will help solve the problem of ICT use not only in Kyambogo University but also in other universities.
- Contextually however, the study will be crucial to the following stakeholders:

Ministry of Education and Sports in its strategy to implement ICT Policy, which has both strategic and operational significance (MoES, 2005:6-17): Among the strategies, the study will address the challenge of linkage between the Ministry of Education & Sports and the universities on matters of policy, guidelines and rules and regulations.

CHAPTER TWO

LITERATURE REVIEW

INTRODUCTION

This Chapter presents theoretical and conceptual frameworks and review of related and relevant literature to the study. The theoretical framework presents the theory that links independent variables to the dependent variables, while conceptual framework exhibits the consequence of mediation of ICT with management of Kyambogo University as linked with bureaucratic theory, and the review of related and relevant literature provides the linkage between literatures reviewed and the objectives of the study.

THEORETICAL FRAMEWORK

The theory underpinning this study is Max Weber's bureaucratic theory. The bureaucratic theory (Weber, 1947) was identified as ideal for the management of Kyambogo University among systems and contingency theory because it is applicable to the management of institutions with massive managerial activities that are routine in nature. The following characteristics of the theory make it relevant for the study:

• Division of work and distribution of duties to workers;

- Existence of formal hierarchical administrative system;
- Application of rules and regulations in a work situation;

- Subordination of individual interests to the official business of the institution; and
- Remuneration of workers according to qualifications and experience, in a hierarchical pattern. These characteristics of the theory reveal that it links the use of ICT to the management of the University.

Bureaucratic Theory

Scheeren (1996) and Nkata (2005:114) name bureaucratic organisation as one of the theoretical orientations that are applicable to university effectiveness. This theory perceived to influence university fineness, in essence manifests effective and efficient management practices in a university as an institution of higher learning.

Weber (1947) with reference to effectiveness and efficiency in organisational management asserts that organisations have three types of power, namely: traditional, rational-legal and bureaucratic power. He however, emphasises bureaucratic power as the most ideal in the management of an organisation. Bureaucratic theory therefore attributed to Max Weber (1864-1920) identified the following characteristics of bureaucratic organisation (Stuart, 1980):

- Division of labour, with activities distributed as official duties, conforms to the concept of organising, an element under POSDCORB.
- Distribution of duties in a hierarchical form relates to directing, the fourth element under POSDCORB.
- Existence of rules and regulations is in line with the concept of controlling, an aspect of management.
- Exclusion of personal interests from official business conforms to planning, the first element under POSDCORB.
- Salaried employment based on technical qualifications and experience within hierarchy, is an aspect of staffing under POSDCORB.

Prasad (1989:345) on the suitability of Bureaucratic Theory in the management setting, states that:

Bureaucratic structure has been considered once superior than ad hoc or temporary structure. It has been termed as rational and ideal leading to efficiency. The efficiency in bureaucratic organisation comes through rationality and predictability of behaviour because everyone knows the consequence of his action before actually the action is undertaken.

Prasad however, also presents that: Bureaucratic assumptions may be invalid because of too much emphasis on rules; rigid organisational hierarchy; total impersonal approaches when dealing with people both within and outside the organisation; too much specialisation; conflict of interest between professionals and bureaucrats; bureaucracy subjects people to work like machines and therefore it is inhuman according to behavioural scientists. These represent the disadvantages of a bureaucratic system of management.

Bureaucratic theory of management was crucial in the study because Kyambogo University had bureaucratic characteristics. The theory provided a link between functionality of ICT and management of the University to enable examination of the relationship between the two variables.

CONCEPTUAL FRAMEWORK

Under the conceptual framework, the study presumed that effective and efficient management of Kyambogo University would be a consequence of mediation of use of ICT when linked with bureaucratic theory. Figure 2 illustrates the conceptual framework of the study.



Figure 2: Conceptual Diagram

Source: Adapted from Owolabi, S.O. (1987). Political and cultural context of educational planning

The model illustrates that use of ICT in terms of: availability of ICT equipment and infrastructure, maintenance of ICT equipment and infrastructure and attitude of users of ICT towards ICT applications, relate to the management of Kyambogo University when linked by Bureaucratic Theory to the elements of management under POSDCORB. Extraneous variables identified as age of ICT user; ICT literacy level or skills and competency of ICT user, type of work of ICT user, ICT equipment and infrastructure quality and ICT budget, are also represented on the model because they could affect results of the study. The results of the study findings would be production of graduates who had gained knowledge, acquired skills and had good behaviour while in the service of the community as contribution to national development.

The conceptual model conforms to the Bureaucratic Theory of management in that it portrays the linkage between the use of ICT and the management of Kyambogo University (Prasad, 1989). The Independent Variables (IV) were investigated to establish their influence on the Dependent Variables (DV). Owolabi (2004:19-20) concurs with this assertion and reports that the value of IVs influences the level of participation of DVs in any given situation. An IV therefore is the presumed cause of an effect (Kakooza, 1996:1) while an EV is the control variable that if not controlled during the investigation process, affects the study outcomes (Gill, Borg & Gill, 1996:467).

RELATED LITERATURE

Review of the related literature entailed study of literature related to the objectives of the study according to the following themes:

- Availability of ICT equipment and infrastructure and the management of Kyambogo

University.

- Use of ICT and the management of Kyambogo University.

- Levels of ICT applications in use and the management of Kyambogo University.

- Maintenance of ICT equipment and infrastructure and the management of Kyambogo

University.

- Attitude of users of ICT towards ICT applications and the management of Kyambogo

University.

Availability of ICT Equipment and Infrastructure and University Management

In reviewing the status of ICT in the American Universities, Hattan, Harpel and Dawson (2004) report that there should be computerisation of universities; linkage to the web by all universities; the making of computer use obligatory to the undergraduate students; and the participation of the government in procurement and making available ICT equipment for the universities. Hattan, Harpel and Dawson present the American scenario, which is unique to American setting. Furthermore, they have not elaborated the status of the ICT in terms of availability in categorised universities and the persons to whom the ICT is available.

Sanyal (1994) however, reveals that most countries of America, Europe and Asia use ICT in the management of the universities, a revelation concurred by Budd (1997), who in his study of a faculty in an American University, established that universities in the U.S.A. use ICT in research activities and email system for communication. his citation does not specify categories of universities by ownership, whether public or private and neither does it elaborate on the ICT and management aspects. Contrary to Sanyal's revelation, the Japanese situation presents that University of Air, i.e. the Open University, in1985 provided distance higher education through ICT mediation and multimedia technologies throughout Japan by linking various study centres and realising 18, 227 graduates by the year 2001(Ministry of Education, Culture, Sports, Science and Technology (MEXT, 2001). The Japanese situation is restricted to distance higher education without mentioning what obtains in conventional setting.

The Indian situation reveals that Indira Gandhi National Open University (IGNOU) established an ICT system to offer distance education to 7 million students (IGNOU, 2002). The revelation by IGNOU is on the Indian situation and moreover restricted to the distance education. Ekong (1992) in citing the African scenario concurs with Hattan, Harpel and Dawson (2004) that Africa is in dire need of ICT because the continent suffers from "information poverty" due to the lack of ICT facilities and infrastructure.

Ekong's citation of the African scenario is too general. It does not include countries and specific sectors of development notably, institutions of higher learning.

According to the World Bank (2004) 2.5 out of 1000 Ugandans have a personal computer and there are 0.007 Internet hosts per 10,000 people; there are 25,000 Internet users in the whole country and one single secure Internet server. The World Bank's data therefore establishes that Uganda is far below the average levels of Sub-Saharan Africa but no contrast has been given with the rest of the world. Furthermore, the World Bank does not underpin the statistics to show ICT aspects intended to be linked to elements of management of public universities and the relationship between the two variables.

Bakunda and Walusimbi-Mpanga (2005) assert that in terms of computer-student ratio, the Ugandan situation reveals the following scenario: At the Uganda Martyrs University Nkozi, the ratio is 1:4, while Makerere University faculties of Forestry, Technology, Computer and Information Technology and Institute of Public Health, the ratio stands at 1:5. Kyambogo University has however, not been mentioned. They conclusively submit that these scenarios exhibit ideal ratios for the institutions of higher learning. Bakunda and Walusimbi-Mpanga have however, not mentioned other aspects of ICT critical to this objective as linked to the management of institutions of higher learning. In line with this concept, Makerere University unlike Kyambogo University put in place a strategy to develop an ICT system (Makerere University, 2000;Kyambogo University 2005/2006). The strategy was intended to enable the University meet changing demands and increasing challenges in both administrative and academic operations. The Makerere University setting is still at developmental level and therefore the objective of availability is not explicitly presented.

The National Council for Higher Education (NCHE, 2005:30-32) however, reports that there was a modest increase in ICT access in the institutions of higher learning as illustrated in the following table:

Table 1: ICT	Accessibility	in Higher	Education	Institutions,	2005
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	1						5
TYPE OF ACCESSIBILITY	PE OF ACCESSIBILITY INSTITUTIONS						
	With	% 2005	With	% 2004	Without	%	
							,
E-mail addresses	97	61.8	79	51.0	60	38.2	-
Websites	42	26.8	34	21.9	115	73.2	
							N
Both (e-mail & websites)	41	26.1	42	27.1	60	38.2	11
							i

al Council for Higher Education (NCHE, 2005).

The table indicates that ICT accessibility in the Ugandan institutions of higher learning increased from 79 to 97 between 2004 and 2005, presenting percentage increase of 17 %. Institutions with websites similarly increased from 34 to 42 in the same period, revealing percentage increase of 4.9 %. For the institutions having both e-mail and website facilities however, the number dropped from 42 to 41, indicating a percentage drop of 1.8 %.

With regard to ICT equipment, the NCHE reports that there was no increase in the number of computers between 2004 and 2005 but there was an increase in the student enrollment. This scenario exhibits a drop in the over all computer-to-student ratio, from 1:35 in 2004 to 1:47 in 2005. The NCHE report however, has not mentioned other aspects of ICT that would benefit the institutions of higher learning when linked to the management of the institutions.

Use of ICT and the Management of Universities

According to IGNOU (2002:2) ICTs are critical in higher education activities because distance education is learner-centred, encompassing a wide

spectrum of technologies that include: print media; audio tapes; video tapes; radio broadcasts; television telecasts; CD-ROMs; teleconferencing and Internet connectivities. The University further reveals that ICT applications are userfriendly, a characteristic that permits optimum utilisation of ICT equipment and infrastructure. The use of multi-media and multi-technologies in IGNOU is intended to meet educational needs of heterogeneous characteristics of nonconventional students.

Dias (2002) in his presentation on globalisation in higher education suggests that ICT be given priority in the universities' strategic plans. This is in view of its adaptability to international, national, regional and local applicability in the management of higher education.

In concurrence with the Indian scenario, the Japanese universities reveal that activation of university administration is ICT-mediated and facilitates diversified self-monitoring and evaluation and active dissemination of information (MEXT, 2001).

While IGNOU presents the Indian setting in the provision of distance learning with ICT-mediation, the Japanese comparison exhibits ICT-mediation in administrative operations of the universities. Both situations have neither specified whether the universities mentioned are public or private and nor name the ICT aspects involved.

Concurring with Dias, the MoES (2005) formulated an ICT policy, which has strategic and operational significance; and Makerere University's scenario however, reveals that the ICT facilities and their use are largely non-existent in most units of the University, especially for administration and development and teaching and learning (Makerere University Strategic Plan 2000/01 - 2004/05).

Inyaga (2002:3) contends that ICT in the institutions of higher learning has great potential to enhance study and teaching activities to increase effectiveness and efficiency in educational managerial operations. He further reveals that use of ICT in the Ugandan universities negatively impacts on the management of the universities because they are not uniformly distributed.

The World Bank corroborates Inyaga's contention and reports that:

Appropriate, well-functioning information and communication technologies are of vital importance to tertiary education because they have the potential to (a) streamline and reduce administrative tasks and in general, make possible greater effectiveness and efficiency in the management of tertiary education systems and institutions; (b) expand access and improve the quality of instruction and learning on all levels; and (c) vastly broaden access to information and data - cross-campus or across the globe. The appearance and the rapid evolution of ICT have created at least two major challenges for education: to achieve the appropriate integration of ICT into over all education systems and institutions, and to ensure that the new technologies become agents of expanded access and equity and increase educational opportunities for the wealthy or technologically privileged.

Inyaga has briefly provided the status in terms of access but he does not categorise the universities, i.e. whether public or private. Dias, MoES, Makerere University, Inyaga and the World Bank, have deviated from the gist of the study. Dias merely guides that ICT should be prioritised in the strategic plans of the universities for purposes of facilitating globalisation through regional and international linkages but falls short of mentioning the current status in terms of ICT use. The MoES' formulation of ICT policy does not give current status of ICT use although the policy framework indicates strategic and operational road map to the establishment of ICT-mediated activities in the universities and other tertiary institutions; and the World Bank has not specified the countries being reported on. Geographical context has not been therefore exhibited.

Levels of ICT Applications in use and the Management of Universities

In the U.S.A., ICT permeates all aspects of higher education: teaching, research and managerial activities (Hattan, Harpel & Dawson, 2004) without categorising what they refer to as "higher education". The Ugandan statistical scenario however, exhibits that ICT facilities and infrastructure are not impressive although Mbarara University of Science and Technology, Uganda Martyrs University Nkozi and Nkumba University are advanced in ICT, while Uganda Christian University, Makerere University, Uganda Management Institute and Bugema University, meet the minimum standards (World Bank, 2004). The status of Kyambogo University is not mentioned. This scenario is corroborated with Inyaga (2002:3) who established that ICT use in the Ugandan universities is not uniform and hence the impact on the management is yet to be realised.

The World Bank mentions the status of the ICT in different universities but is silent about the levels of use of both the equipment and infrastructure. The Indian scenario on the other hand, presents that ICT is utilised by academic staff for teleconferencing, teletraining, and virtual convocations while students use ICT to: download course materials or browse through the course materials and exchange information on assignments; e-mail academic materials and communicate with fellow students; and chat or interact with both fellow students and lecturers (IGNOU, 2002). IGNOU presents levels of ICT applications in use obtaining in India but specific to distance higher education. This study would wish to examine levels of application in a conventional university and categorised into public or private university.

Munhuweyi (2005:1-25) however, contradicts the Indian situation. He submits that Africa's disadvantaged position is due to inadequate funding of the institutions of higher learning. He therefore presents that donor agencies should contribute to the vitalisation process of university education in Africa, by facilitating collaborative arrangements and linkages with technologically advanced counties and institutions and fostering leadership and management skills. This suggests linkage through ICT-mediation. Furthermore, Munhweyi's citation is restricted to the funding of institutions of higher learning, suggesting that inadequate funding disables application of various levels of ICT applications in use in the management of the institutions of higher learning.

The South African scenario comparatively reveals that research at the institutions of higher learning employs new forms of ICT, the information high way to accelerate and broaden data and research findings (Republic of South Africa, 1997). This situation is limited to application of ICT in research as an aspect of higher education. Other aspects of operations in the institutions of

higher learning have not been mentioned in relation to the ICT levels of application. The Higher Education Funding Framework requires ICT for the Higher Education Management Information System - for the student count. The Kenyan educational system in contrast to the South African one is however, faced with challenges that include initiation of innovative practices to expand access and improve quality. It is further reported that improvement of quality in education entails mediation of the institutional activities with ICT system and admission of students who qualify to be admitted and production of graduates who have been properly trained to contribute to the national development (Aduala, 2001). Aduala reports on the challenges of entire educational system without specifying the level. An educational system can be classified into first, second and third level. This study is however, restricted to the third level, i.e. public universities, to which Kyambogo University belongs.

On the Ugandan scenario, Nnagenda (2004:20) proposes that operationalisation of ICT policy in education will entail the following levels of ICT applications:

- The role of the academic staff to undertake teaching aspects.
- In self-study situations, students should be able to search the sites of an elearning either on the Internet or on the local database in-country.
- Both academic staff and students are expected and required to source information from electronic libraries to access the best information sources in their fields of study.

- An on-line education that should have a component of communication characterised by e-mail system; bulletin Boards and teleconferencing, ideal to both staff and students.
- Virtual university system with various aspects of ICT applications, which both staff and students can utilise to meet the institutional goals. Nnagenda like Aduala does not specify the level of education. Uganda has three levels of education, notably: primary (first level); secondary (second level); and tertiary or higher (third level) (Bilali, 2003). Levels of ICT applications in use on the ground at Makerere University however, consist of use in student registration, examination, and records; financing and accounting, estates; library management; personnel; office system, e.g. document productionmail use and Internet access (Makerere University, 2004). The University presentation has not named departments, where levels of ICT mediation are applied, against the background that administration unit, together with various other operational units that include academic faculties the University is made up of. None of them has however, been mentioned.

The World Bank (2004:33) reports that the ICT revolution has enabled institutions of higher learning to provide education internationally and nationally and according to the Organisation of Economic Cooperation and Development (OECD, 2004) the member countries are investing substantially to improve quality of teaching and learning in the institutions of higher learning. Citing the Sub-Saharan scenario, the Bank names the African Virtual University for pioneering to offer university curriculum, using teleconferencing and Internet connectivities. The International Institute for Educational Planning (IIEP, 2006:3) submits the concept of curriculum management through ICT-mediation in terms of the objective of advanced training. The Institute suggests that the objective of the advanced training programmes is to provide tools for building and using information systems for decision-making and educational policy analysis as aspects of good management practices.

The IIEP is silent about the level of the educational system although the phrase "advanced training programmes" has been used to suggest the mediation is with reference to the institutions of higher learning.

Psacharopoulos and Woodhall (1985:206) in corroboration with the World Bank and OECD, argue that in considering external and internal efficiencies relating to the quality of education, economic efficiency, together with technical efficiency in the form of ICT-assisted learning, are primarily critical. They have however, not specified the country where the variables would be most ideal and categories of institutions according to the level of training.

The Mozambican higher education system developed a 10-year strategic plan with the Management Information System concept in consideration. This strategy was to address efficiency in the university faculties and academic departments. This, it is argued will also increase efficiency in management and administration of the entire higher education system (Republic of Mozambique, 2000:13 & 14).

The Mozambican approach is geared towards the establishment of MIS to cause efficiency in the academic units of the institutions of higher learning as a road map to address inadequacies in the entire institutional management and administration. Categories of the institutions are however, not mentioned.

The World Bank reports on only one aspect of ICT identified for the study namely, curriculum management. Even then, it is the distance education curriculum that has been underpinned. The OECD in contrast, reports on the investment aspect of ICT by the member countries and institutions to provide compatibility with the concept of study.

The IIEP's submission narrows down to the objective of the advanced training programme without mentioning educational levels and types of institutions of higher learning. The submission is also limited to ICT-mediation in decision-making and policy aspects of operations of the institutions of higher learning.

In contrast to the Sub-Saharan Africa, Japanese universities are however, at an advanced stage of using ICT in the curriculum management:ICT is actively used in academic units of the univerties and all credits required for graduation through distance learning are ICT-based while up to 60 credits for conventional higher education are ICT-aided (MEXT, 2001). Although the Japanese scenario exhibits application of ICT in curriculum management of both distance learning and conventional system, categories of institutions in terms of control or ownership are not mentioned. Ideally, there is need to know whether the presented scenario is for the public or private institutions of higher learning.

The Ugandan scenario however, contrasts with the Sub-Saharan one. The current tertiary education curriculum design is not relevant to the economic needs of Uganda because it lacks ICT component MoES (1989). This scenario is corroborated by Inyaga (2002:14 & 55), who asserts that the Ugandan universities are faced with challenges of catering for full-time, parttime and distance learning students. The challenge is embedded in the provision of higher education to different categories of students. Inyaga further asserts that the Ugandan universities are not adequately equipped with ICT and underscores the importance of ICT policy as a basis for addressing the challenge.

The MoES and Inyaga have not specified whether the situations presented relate to the public or private universities. Furthermore, the presentation is restricted to the distance learning aspect of the universities.

Following the revelation of contrast between the Sub-Saharan and Ugandan scenario in curriculum management, the MoES (2003) developed strategies to revamp Uganda's higher education curriculum and integrate it with ICT. The strategies include encouragement of tertiary institutions to use ICT in delivering quality higher education. In line with this concept, Kyambogo University established an ICT infrastructure, which mediates in curriculum delivery at primary and secondary school levels (Kyambogo University, 2002) and Makerere University developed the 2000/01 – 2006/07 Strategic Plan that provides for the transformation of teaching and learning through application of ICT, and curriculum reform form main directions of the ICT strategy (Makerere University, 2004).

In concurrence with the Strategic Plan, the National Curriculum Development Centre (NCDC) together with stakeholders (institutions that offer Diploma in Journalism programme) developed a curricular programme of Diploma in Journalism in 2002, in which ICT aspects were incorporated.

The institutions that offer Diploma in Journalism are however, private and not at the university level by status.

The Ministry of Education and Sports contends that irrelevancy of the curriculum in the education system is attributed to the lack of ICT. The system however, has not been categorised into either the public or private institutions of higher learning.

The introduction of ICT in Kyambogo University is restricted to the management of the curriculum at primary and secondary level, without mentioning its applicability to the university curriculum management in its totality. On the other hand, Makerere University only mentions its strategy to formulate curriculum reforms as a main direction towards ICT use in the curriculum management.

Under the international trade in education concept, Bakunda & Walusimbi-Mpanga (2005) present that education services in Uganda has experienced significant growth, notably, in the marketing of the curricular programmes, establishment of curriculum delivery centres in the form of branch campuses and development of cooperative arrangements that are normally ICT-mediated.

Bakunda and Walusimbi-Mpanga (2005) present significant growth as manifested in the marketing of curricular programmes, together with establishment of curriculum delivery centres and development of cooperative arrangements as positive trend towards ICT application in the curriculum management. Furthermore, they do not categorise the growth into levels of Uganda's educational system.

Maintenance of ICT Equipment and Infrastructure and University Management

The World Bank (2002:39) reports that adoption of ICT as a pedagogical tool and mode of curriculum delivery has cost implications in terms of maintenance costs for the equipment and infrastructure. The maintenance of ICT hardware and software is vital for good performance of the system and promotion of effective and efficient management of institutions of higher learning. The World Bank's report is limited to the cost implications on the maintenance of the ICT equipment and infrastructure in the institutions of higher learning. The Report does not state whether the institutions are public or private by status.

With in the strategic significance of the ICT policy, MoES (2005:17) names maintenance and sustainability of the concept, notably:

- Initiation of maintenance programmes for ICT in the education sector.
- Setting up sinking funds to sustain the ICT system.
- Where applicable, introduction of minimal user-charges, especially where equipment is shared with the community.
- Putting in place management system to maintain workstations, servers, data communication equipment, etc.

The MoES names maintenance and sustainability, as component of ICT policy but is silent about the training levels of the institutions. Among other ICT-related activities, IGNOU however, carries out maintenance of ICT equipment and infrastructure to realise effectiveness and efficiency in managerial operations and in study and teaching activities (IGNOU, 2002:42).

The Indian scenario (IGNOU, 2002) is ideal for an Asian continent setting. Furthermore, it is restricted to the distance education and does not name the institutional categories according to ownership. Bongyeirwe (2002:25) in contrast to the Indian situation reports that the African growing universities, notably, Mbarara University of Science and Technology in Uganda, have computers for teaching and research but their maintenance is not ensured.

Kyambogo University has ICT system (Kyambogo University, 2002). This scenario is manifested by the availability of courses in ICT at Certificate, Diploma and undergraduate Degree levels (Kyambogo University Prospectus, 2005) suggesting that the University has a considerable number of computer pieces. This calls for maintenance and service for effective and efficient performance.

The situation prevailing at Kyambogo University presents availability of ICT equipment and infrastructure but does not explicitly mention whether or not maintenance works on the ICT system is carried out.

Attitude of Users of ICT Towards ICT Applications and University Management

ICTs are fast revolutionising higher education globally (World Bank, 2004). It is noted that a researcher in one institution can electronically access publications from several universities globally; one lecturer can attend to thousands of students spread across a number of universities using high-speed networks and multi-media technologies; the Internet has become an

indispensable linkage for many students and lecturers; and virtual universities are now a reality. This scenario presents that user-attitude towards ICT applications is positive. The World Bank however, reports on the global scenario without specifying continents and countries and with in countries categories of institutions according to ownership.

Hall (1996:75-88) observes that although ICT applications in the various activities of institutions of higher learning is good as it is intended to enhance the degree of performance and improvement of effectiveness and efficiency in managerial operations, increased use of ICT in education could lead to less equity in access. This is in view of heavy investment costs needed to initiate, operationalise, maintain and sustain the system. Hall's observation is inclined towards cost implication of establishing, operationalisation, maintenance and sustainability of the ICT system.

While Sheila (1991) provides a mixed evaluation of Asia's scenario in general by asserting that automation of education both threatens and promises efficiency in employment economy and development of global culture, Shukla's evaluation is specifically based on the Indian scenario and is restricted to the automation of education in relation to the implementation of global practices: Education has been not categorised into the levels of training.

The U.S.A. and Canada like Asia present a mixed scenario: the degree of ICT applications among the universities in 1999 was such that they provided

usage literacy and not technological support to the academic activities of the universities. The students experienced stress and anxiety when using ICT in study contexts (Carter, 1999). The American and Canadian experiences however, represent situations in the developed countries restricted to study context of the students without evaluating attitude of the staff. This presents a knowledge gap.

Kigongo-Bukenya (1996: 11) on the Ugandan situation, contends that while ICT has attributes of accuracy, speed, compact, storage and an unlimited instant communication, it creates a catalogue of staff managerial problems, including redundancy of staff when institutions demand for re-structuring with reduction of staff. This contention presents negative attitude towards ICT applications in the institutions of higher learning.

Kigongo-Bukenya (1996) submits attitude of users in terms of employment without mentioning the type of organisations, where such a situation may prevail. This study is restricted to the investigation of Kyambogo University.

CHAPTER THREE

METHODOLOGY

INTRODUCTION

This chapter highlights the research design; the research approach; the study population; sample size; sampling techniques; procedure; data quality control; and method of data analysis.

RESEARCH DESIGN

Cross-sectional survey research design was used to collect data from the respondents because the study had exploratory characteristics that would enable identification of the effects of ICT aspects on the management of Kyambogo University. Furthermore, the research design was chosen because: data from respondents was collected once from a specific area of investigation within a specific period of time; the design had ideal characteristics for the study, notably:

 data were not collected from the entire study population therefore inferential methods were used to generalise findings to the entire population; and respondents that were in group-form of the academic staff, students, senior management staff and top management officers of Kyambogo University responded to a set of questions at one point in time and in one place thus controlling external changes that might be of social, cultural, political and technological nature, would not affect the results of the investigation as time progresses.

The study involved the use of sampling techniques to select respondents and administration of self-administered questionnaires and face-to-face interview schedules as a method of collecting data. This sampling technique was used because the study was an educational research by character (Mbaaga, 1990:27; Kakooza, 1996:9-10) The research approach was supported by quantitative techniques that entailed use of ICT (Bailey, 1987).

POPULATION

The study population consisted of: all full-time management (18) and academic staff (80); and resident students (450) of Kyambogo University. The University as a focus of study was randomly selected from the four public universities as a case study. The selection was representative enough to yield credible results (Gay, 1976).

A total of 450 resident students were systematically drawn from the total of 4,502, i.e.10% of the target population. All the 98 full-time staff that appeared in the departmental staff lists was taken as key respondents.
Systematic sampling technique was used to select the study sample of the resident students because it has three advantages over simple random sampling, namely:

- It is simple to draw since only one random selection/respondent is required.
- It distributes the sample more evenly over the listed population.

Although the method has one disadvantage, notably lack of reliable method of estimating standard error of the sample mean, it has built-in stratification characteristics (Snedecor & Cochran, 1989)

SAMPLE SIZE

The following table presents the sample size selected for the study:

Table 2: Sample Size of the Study by Category of Respondents and TargetPopulation

CATEGORY OF	TARGET	SAMPLE SIZE
RESPONDENTS	POPULATION	
Management Staff	18	18
Academic Staff	80	80
Resident Students	4,502	450
TOTAL	4,600	548

The size of the sub-groups represented in the table was selected in those proportions to represent the target population as follows: 18 management staff, 80 academic staff and 450 resident students. The selection was carried out according to Krejcie and Morgan's table of determining sample size for research activities in educational and psychological measurement (Amin, 2005: 454). The total sample size selected for the study was 548 respondents, consisting of 18 management staff and 80 academic staff, together with 450 sampled resident students. The sample size was representative enough and would not affect the results of the study (Amin, 2005: 454).

SAMPLING TECHNIQUES

Cross-sectional survey research design was ideal for this study because it has almost the same characteristics as descriptive research design, namely: ICT use was distributed to different users of ICT in different sub-groups (Mbaaga, 1990;Bailey, 1987).

Systematic sampling method was adopted by selecting every 10^{th} name from the

Sampling frame (admissions register). There were 4, 502 names in the frame and by selecting every 10th name, the researcher was able to pick 450 names (Kakooza, 1996:13; Amin, 2004:28 & 2005).

A total of 98 full-time staff, consisting of 18 management and 80 academic staff, respectively was purposively taken as key respondents.

METHODS

The following methods were used to collect data for the study:

Documentary Review

This method was used to collect information related to the use of ICT in the management of Kyambogo University.

The method had been chosen because the study covered aspects of historical perspective, which the researcher sought to identify in the course of the study. The researcher however, supplemented this method with other methods, namely: questionnaire distribution and face-to-face personal interviews.

Survey

Three sets of self-administered questionnaires were used to collect data from senior management staff, academic staff and the sampled students. The questionnaires distributed to the senior management and academic staff had three sections, namely: Section A for background information, Section B for information on ICT aspects, and Section C for information on aspects of management. Each questionnaire had about 39 questions, consisting of many structured and a few open-ended questions.

The questionnaires distributed to student respondents also had three sections, consisting of A for background information; B for ICT aspects; and C for management aspects. The questionnaire had 41 questions.

Questionnaire Distribution

Questionnaire distribution method was used to collect data from 80 academic staff, including Faculty Deans; 10 senior management staff; and 450 sampled students, including members of the Students' Guild Government. This method was ideal for these categories of the population because they might not have time to be interviewed but could respond through the questionnaires.

Although questionnaire distribution method has weaknesses that include high non-response rate, hard implementation of open-ended questions and careful designing and development of questions, it has the following strengths: more convenient for the respondents, suitable for quantifying responses, and uniformity for presentation of responses because of non-interviewer bias and low cost.

Face-to-face Personal Interviews

This method was used to collect data from seven Top Management Officers of the University. The interviews were conducted with the Vice Chancellor, the Deputy Vice Chancellor in charge of finance and administration; the University Secretary; the Academic Registrar; the Dean of Students; the University Librarian; and the Deputy University Secretary.

The researcher chose this method because it would help to collect exhaustive information he might not be able to collect through the questionnaire distribution. The method had advantage of flexibility and allowed probing of specific answers, repeating of questions for clarity and rephrasing of questions for simplicity.

The face-to-face personal interview had yet other merits that the researcher identified, namely: high response rate from respondents; providing an opportunity to the researcher to study non-verbal behaviour of the respondents and be able to assess the validity of the response; enabling the researcher to control the study environment unlike in the case of a questionnaire, where respondents may discuss answers before answering the questions (Sproull, 1995:47). The face-to-face personal interview method was because it was ideal for collecting qualitative also chosen data (www.wikipedia.com, retrieved: 20th April 2006). The study had a component of qualitative design.

The interview schedule used had three sections, namely: Section A, soliciting for background information; Section B solicited for information on ICT aspects; and Section C solicited for information on management aspects.

DATA QUALITY CONTROL

Data quality control was ensured by checking the validity and reliability of the research instruments as follows: copies of the questionnaires and the objectives of the study were given to the two supervisors (as critical judges) to ascertain whether the instruments accurately and consistently measured what they were designed to measure (Amin, 2005). Furthermore, the quality control process was carried out to check the phrasing, understandability and wording of the statements. The judges were independently asked to assess the content validity and reliability of the instruments with the following aspects in consideration:

- Linking each item of the questionnaire with its respective objective.
- Assessing relevancy of the items to the content as addressed by objectives of the study.
- Evaluating the adequacy of items to represent the content of the subject under study.

Following the feedback from the two judges, amendments were made to simplify the questioning approach, and some re-arrangement of question sequence was carried out.

DATA ANALYSIS

Data analysis involved verification of the hypotheses by a computerbased Statistical Package for the Social Sciences (SPSS Version 13.0) as follows:

- The first and second hypotheses were verified with the student t-test because it was ideal for testing the means of responses to establish degrees of significance;
- The third hypothesis was measured with a non-parametric Kruskal-Wallis test, using question 13 from the students' questionnaire. This technique was used for student-respondents because homogeneity of assumption normally associated with ANOVA would be violated if the test carried out with ANOVA. The ANOVA was run to test responses to question 11 for the academic staff.

- The fourth hypothesis was verified with ANOVA using "management" as a non-categorical variable; and
- Pearson's Correlation Coefficient was used in the fifth hypothesis because continuous variables were involved.

Control of Extraneous Variables

During the study, a number of extraneous variables, notably: age of ICT user; type of work of ICT user; ICT budget; ICT literacy level and competency of ICT user; and ICT equipment and infrastructure quality, might have had undesirable effects on the dependent variable, i.e. management, other than the independent variable (the use of ICT) by adding error to the investigation. In order to control the effect of these variables, the researcher initially applied random sampling for the student-respondents before using systematic sampling. Random sampling was particularly initially preferred before systematic sampling technique was applied because, with a large number of respondents in the sample, the technique greatly decreases systematic error that varies with the independent variable, such that there is a high probability of getting subjects with different characteristics from all potential respondents across the distribution. This ensured even distribution of the effects of the extraneous variables across all the groups at the beginning of the study. The subjects were therefore drawn in such a way that every respondent had precisely the same probability of being included in the sample, hence guaranteeing that samples used in the study represented conditions that were not only particular to a specific group, situation or condition (Clague and Schaaf, 2002).

CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETATION OF FINDINGS

INTRODUCTION

This chapter is divided into three sections, namely: Section One presents the description of how the Independent Variables, i.e. the ICT aspects, vary with the Background Variables; Section Two, describes the variation between the Dependent Variables, i.e. the management aspects, and the Background Information; and Section Three presents findings according to the hypotheses cited in chapter one. While presenting the findings, their analysis and interpretation were carried out based on the data collected from the sampled respondents; and the verification of the hypotheses entailed use of the Statistical Package for Social Scientists (SPSS), the hypotheses being tested one by one and the results generated used to test the null hypotheses. The results of the findings have been presented in the form of tables, frequency counts and percentages, in line with the five objectives of the study and the data on the five objectives being collected from the students, academic staff, senior management staff and top management officers of Kyambogo University, using four sets of data collection instruments. The items on the instruments covered the various aspects of ICT and management, respectively, namely: availability of ICT equipment and infrastructure, use of ICT in the management operations, levels of ICT applications in use in the University, maintenance of ICT equipment and infrastructure and attitude of users of ICT towards ICT applications; and Planning, Organising, Staffing, Directing, Controlling, Reporting and Budgeting (POSDCORB) for management.

Composite indices for the independent and dependent variables respectively, were designed and computed by summing up the values of all valid responses intended to obtain respondents' opinions for the different aspects of ICT and management. The rationale for summing up the responses was to establish whether management of Kyambogo University varied with each aspect of the use of ICT. The presentation, analysis, together with the interpretation of the findings was based on the empirical data and objectives of the study and carried out to establish the relationship between the use of ICT and management of Kyambogo University.

SECTION ONE: RESPONDENTS' OPINIONS IN RELATION TO THE

USE OF ICT

This section presents the demographic scenario of the study participants, together with the respondents' opinions on the independent variable. The presentation is done in relation with the background information of the respondents. The findings are contained in this section.

The Demographic Characteristics of the Respondents

The demographic scenario of the study participants has been presented in Table 3.1 below, which reveals the demographic characteristics of the respondents who participated in the study.

Table 3.1: Distribution of Respo	ondents by	7 Gender
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			Sex			
CATEGORY OF	M	ale	Fer	nale	To	otal
	Freq	%	Freq	%	Freq	%
Students	167	68.7	76	31.3	243	100.0
Academic Staff	29	69.0	13	31.0	42	100.0
Top Management Officers	5	71.4	2	28.6	7	100.0
Senior Management Staff	4	57.1	3	42.9	7	100.0

The table shows that the study covered the actual sample of 243 students of whom 68.7 % were males and 31.3 % females, against 450-target sample.

The table also shows that of the 42 actual sample of academic staff against targeted sample of 80, 69.0 % were male and 31.0 % female. Among the top management officers sampled, within the actual sample 7, males constituted 71.4 % and females 28.6 %. In the same vein, the senior management staff's actual sample was 7, among whom 57.1 % were males and 42.9 % females. These percentages were computed on the basis of sex of the study-participants that responded. The target sample for both top management officers and senior management staff was 18. This implied that thee were more male respondents in the study than females.

Academic Staff Responses on the Availability of ICT Equipment and Infrastructure

Table 3.2 below, presents frequency counts in relation to the relationship between the availability of ICT equipment and infrastructure and the background information among the academic staff of Kyambogo University.

Table 3.2:Variation Between Availability of ICT Equipment and Infrastructure and Background Information, According to the Academic Staff of Kyambogo University

Background		ICT	ICT equipment available Total If "Yes", in (6) above, is t and, or infrastru						e, is the	e equi ture:	pment	Total			
Background Information of the			Yes		No			Functional		Effective		Non- functional			
Academic Staff		Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Ser	Male	24	82.8%	5	17.2%	29	100.0%	20	80.0%	3	12.0%	2	8.0%	25	100.0%
Sex	Female	12	92.3%	1	7.7%	13	100.0%	5	41.7%	5	41.7%	2	16.7%	12	100.0%
	Lecturer	34	85.0%	6	15.0%	40	100.0%	23	65.7%	8	22.9%	4	11.4%	35	100.0%
Designation	Senior Lecturer	2	100.0%			2	100.0%	2	100.0%					2	100.0%

	Arts & Social Sciences	2	100.0%			2	100.0%	2	100.0%					2	100.0%
Faculty	Engineering	7	87.5%	1	12.5%	8	100.0%	7	100.0%					7	100.0%
	Education	25	83.3%	5	16.7%	30	100.0%	14	53.8%	8	30.8%	4	15.4%	26	100.0%
	Vocational Studies	2	100.0%			2	100.0%	2	100.0%					2	100.0%
	First degree	5	71.4%	2	28.6%	7	100.0%	4	80.0%	1	20.0%			5	100.0%
Qualifications	Second degree	29	87.9%	4	12.1%	33	100.0%	20	66.7%	6	20.0%	4	13.3%	30	100.0%
	PhD	2	100.0%			2	100.0%	1	50.0%	1	50.0%			2	100.0%

Responses in Relation to the Sex of the Academic Staff

In Table 3.2, the availability of the ICT equipment and infrastructure was rated higher (24, 82.8 %) among the males than females (12, (17.2 %). With regard to the academic staff who said that the equipment and infrastructure were not available, the percentage was higher among the males (17.2 %) than females (7.7 %), suggesting that fewer female academic staff use computers in Kyambogo University than the males. The functionality of ICT indicated that it was more identifiable among the male academic staff than the female counterparts. However, more females revealed that the ICT equipment and infrastructure were effective. The non-functionality of ICT equipment and infrastructure was identified by either sex in equal numbers, i.e. two males and two females revealed that the ICT equipment and infrastructure were non-functional. This implied that in relation to the designation of the academic staff, ICT equipment and infrastructure were available. At Kyambogo University.

Responses in Relation to the Designation of the Academic Staff

According to the designation, the availability of the ICT equipment and infrastructure among the academic staff was such that all senior lecturers (100.0%) revealed that the ICT equipment and infrastructure were available as opposed to that of lecturers (85.0%). With regard to the functionality of the ICT equipment and infrastructure, 65.7% of the lecturers indicated that they were functional and 100.0% of all senior lecturers provided that the ICT equipment was functional. A smaller number of lecturers who presented that the ICT equipment and infrastructure were available also presented that the available ICT equipment and infrastructure were effective while the smallest number indicated that they were non-functional. An insignificant number of the senior lecturers (2) revealed that the ICT equipment and infrastructure were available and functional with none indicating neither the effectiveness nor nonfunctionality of the ICT equipment and infrastructure. This suggests that the ICT equipment and infrastructure at Kyambogo University were functional and effective in performance.

Responses in Relation to the Faculty of the Academic Staff

The responses regarding the availability of ICT equipment and infrastructure in relation to faculty of the academic staff showed higher percentages, ranging from 83.3 % for the Faculty of Education, to 100.0 % for the faculties of Vocational Studies and Arts and Social Sciences. This implies that the ICT equipment and infrastructure were available in the different faculties. Regarding the functionality of ICT equipment, all academic staff, save faculty of education (53%), unanimously maintained that in their faculties, the

ICT equipment and infrastructure were functional. Regarding the effectiveness of the available ICT equipment and infrastructure, 8 (30.8%) academic staff from the Faculty of Education indicated that the equipment and infrastructure were effective while the smallest number and percentage (4, 15.4%) said that the equipment and infrastructure were non-functional. None of the staff from the faculties of arts and social sciences and vocational studies responded to the functionality, effectiveness and non-functionality of the ICT equipment and infrastructure. This scenario implies that computers at Kyambogo University are mainly utilised by the academic staff from the faculty of education followed by those from the faculty of engineering, may be because of the large numbers of staff from the two faculties.

Responses in Relation to the Qualifications of the Academic Staff

In relation to the qualifications of the academic staff, the findings exhibited that the highest percentage of the academic staff with PhDs (100%) showed that the ICT equipment and infrastructure were available, followed by those that possessed second degrees (87.9%) and then those with first degrees (71.4%). Regarding the functionality of the ICT equipment and infrastructure, the greatest percentage that said that the equipment and infrastructure that were functional were those with first degrees (80%), followed by second degree holders (66.7%) and subsequently, those with PhDs came last (50%). When it came to the effectiveness of the ICT equipment, 20 percent of the academic staff holding first and second degrees indicated that the ICT equipment and infrastructure were effective. On contrary, 50 percent of PhD holders mentioned the effectiveness of the ICT equipment and infrastructure. This

scenario revealed that in Kyambogo University, the academic staff with second degrees was mostly conversant with the functionality and effectiveness of the computers. The advancement in education, together with the bigger numbers of study-participants from the second-degree holders could justify the scenario.

Academic Staff Responses on the Use of ICT Equipment and Infrastructure

Table 3.3 indicates frequency counts of the academic staff in relation to the use of ICT equipment and infrastructure. The responses are presented in relation to their different background information.

Table 3.3: Variation Between use of ICT and Background Information, According to the Academic Staff of Kyambogo University

Background Information of		"Does	s schedule call for use	of you: e of ICT	r duties ??"	Т	otal
the Academic		No	Freq	%			
Staff		Freq	%	Freq	%		
Sex	Male	22	75.9%	7 24.1%		29	100.0%
	Female	8	61.5%	5	38.5%	13	100.0%

Designation	Lecturer	28	70.0%	12	30.0%	40	100.0%
	Senior	2	100.0%			2	100.0%
	Lecturer						
Faculty	Arts &	2	100.0%			2	100.0%
	Social						
	Sciences						
	Engineering	7	87.5%	1	12.5%	8	100.0%
	Education	19	63.3%	11	36.7%	30	100.0%
	Vocational	2	100.0%			2	100.0%
	Studies						
Qualifications	First Degree	4	57.1%	3	42.9%	7	100.0%
	Second	24	72.7%	9	27.3%	33	100.0%
	Degree						
	PhD	2	100.0%			2	100.0%

Responses in Relation to the Sex of the Academic Staff

In Table 3.3, the findings indicate that male respondents formed the highest percentage of participants (75.9%) who indicated that schedule of duties called for use of ICT. With regard to those whose duties did not call for the use of ICT, the percentage was higher (38.5 %) among the females than males (24.1 %), although by numbers seven males and five females said that their duties did not call for the use of

the computers. This implies that the duties of male academic staff required ICT use more than those of the females.

Responses in Relation to the Designation of the Academic Staff

The responses in relation to designation of the academic staff showed that a greater number of lecturers (28) indicated that their duties called for the use of ICT equipment and infrastructure than that of the senior lecturers (2), with still a bigger number among the lecturers revealing that their duties did not call for the use of the ICT. Despite the smaller number of the senior lecturers that presented that their duties called for the use of ICT equipment and infrastructure, none of them showed that their duties did not call for the use of ICT equipment and infrastructure, suggesting that the duties that called for the use of ICT equipment and infrastructure in Kyambogo University were predominantly occupied by senior lecturers, may be due to the smallness of their numbers, coupled with the nature of training that called for use of ICT in their duties.

Responses in Relation to the Faculty of the Academic Staff

Differences of opinions with reference to the faculty of the academic staff were identified in terms of the staff duties that called for ICT use. The findings exhibited that it was greatest among the academic staff that belonged to the faculty of education (19), followed by those who belonged to the faculty of engineering (7). The staff members of the faculties of arts and social sciences and vocational studies had the smallest number. Regarding the academic staff whose duties did not call for the use of ICT equipment and infrastructure, the findings presented that the biggest number was still among those who belonged to the faculty of education (11), followed by only one in the faculty of engineering (1), with none from the faculties of arts and social sciences and vocational studies. This scenario presupposes that among the faculties, the duties of the academic staff from the faculty of education mostly called for the use of ICT equipment and infrastructure.

Responses According to the Qualifications of the Academic Staff

PhD holders among the academic staff had the highest percentage of ICT users whose duties called for the use of ICT equipment and infrastructure (100%) followed by those in possession of second degrees (72.7%) and then first the degrees holders (57.7%). The staff with PhDs constituted an insignificant number although the percentage was highest because the only respondents to the item were two in total. The academic staff with first degrees presented a higher percentage than those whose duties did not call for the use of ICT equipment and infrastructure. The findings therefore revealed that, the duties that required use of ICT at Kyambogo University were basically those of the academic staff with second degrees.

Academic Staff Responses on the Levels of ICT Applications in use

Table 3.4 presents the respondents' views regarding the levels of ICT applications in use among the academic staff of Kyambogo University.

Table 3.4: Levels of ICT Applications in use According to the Academic Staff of Kyambogo University

Levels of ICT Applications in		
use Among the Academic Staff	Frequency	Percentage
Aspect		
Curriculum Design	4	9.5
Curriculum Development	6	14.3
Curriculum Delivery	18	42.9
Electronic References	4	9.5
Communications	3	7.1
Document	5	11.9
Production/Secretarial		
Functions		
Entertainment	2	4.8
Total	42	100.0

In Table 3.4, the levels of ICT applications in use among the academic staff was highest among the staff that used ICT for curriculum delivery (42.9%), followed by that of those that used ICT for curriculum development (14.3%); production of documents/secretarial functions (11.9%); curriculum design and electronic references (9.5%); communication (7.1%) and entertainment (4.8%). These findings exhibited that the academic staff predominantly used ICT for curriculum delivery but not for electronic referencing. They also rarely used ICT for entertainment may be because they were old and therefore they did not fancy using ICT for entertainment and, or

because of the nature of their duties, coupled with their ethical values related to the use of ICT.

Academic Staff Responses on the Maintenance of ICT Equipment and Infrastructure

Table 3.5 presents the findings from the academic staff in relation to the maintenance of ICT Equipment and Infrastructure. The findings are presented in relation with the background information of the academic staff of Kyambogo University.

Table 3.5: Variation Between Maintenance of ICT Equipment and Infrastructure and Background Information, According to the Academic Staff of Kyambogo University

Background		"Are	e the ICT eo	aculty	Total						
Information of the		C)ften	Alv	ways	Occas	sionally	N	ever	Freq	%
Academic Staff		Freq	%	Freq	%	Freq	%	Freq	%	-	
Sex	Male	9	31.0%	3	10.3%	14	48.3%	3	10.3%	29	100.0%
	Female	1	7.7%	3	23.1%	9	69.2%			13	100.0%
Designation	Lecturer	9	22.5%	6	15.0%	22	55.0%	3	7.5%	40	100.0%
	Senior	1	50.0%			1	50.0%			2	100.0%
	Lecturer										
Faculty	Arts & Social	1	50.0%			1	50.0%			2	100.0%
	Sciences										
	Engineering	1	12.5%	2	25.0%	5	62.5%			8	100.0%
	Education	6	20.0%	4	13.3%	17	56.7%	3	10.0%	30	100.0%
	Vocational	2	100.0%							2	100.0%
	Studies										
Qualifications	First degree	3	42.9%	2	28.6%	2	28.6%			7	100.0%
	Second	6	18.2%	4	12.1%	20	60.6%	3	9.1%	33	100.0%
	degree										
	PhD	1	50.0%			1	50.0%			2	100.0%

Responses According to the Sex of the Academic Staff

The greatest percentage among both the males and females indicated that the ICT equipment and infrastructure were occasionally maintained, with females taking the highest percentage of 69.2 percent. An insignificant percentage of females (7.7 %) said that the equipment and infrastructure were often maintained while among the males the percentage was significant (31.0 %). An equal number of both males and females showed that the equipment and infrastructure were always maintained. This state of affairs therefore signifies that the ICT equipment and infrastructure at Kyambogo University were occasionally

maintained, implying that according to the sex of the academic staff, the ICT equipment and infrastructure were not in good operational conditions.

Responses in Relation to the Designation of the Academic Staff

Responses according to the designation of the academic staff showed that a bigger number of the staff that responded to this question was that of lecturers (40) and senior lectures constituting only 2. A considerable percentage among the lecturers and senior lecturers showed that the equipment and infrastructure were occasionally maintained as given by the percentages of 55% and 50% respectively. A smaller number of lecturers showed that the equipment and infrastructure were never maintained 3(7.5%). However, none among the senior lecturers responded to this question. This scenario therefore suggests that the equipment and infrastructure were occasionally maintained, an indication that according to the designation of the academic staff like in the case of sex of the academic staff, the ICT equipment and infrastructure at Kyambogo University were not in good operational conditions.

Responses in Relation to the Faculty of the Academic Staff

In Table 3.5, the findings revealed the following position: The biggest number of the respondents to the item belonged to the faculty of education, followed by that of those that belonged to the faculty of engineering; insignificant numbers of the respondents were from the faculties of arts and social sciences and vocational studies. Within the faculties of education and engineering, the biggest percentage of participants revealed that the ICT equipment and infrastructure were occasionally maintained (56.7% and 62.5% respectively), with insignificant numbers saying that the ICT equipment and infrastructure were often, always and never maintained. None from the faculty of arts and social sciences responded to the "always" frequency. These findings presuppose that according to the faculties of the academic staff, the ICT equipment and infrastructure at Kyambogo University may not be in good operational conditions.

Responses in Relation to the Qualifications of the Academic Staff

From the table, among the second-degree holders, the highest percentage said that the ICT equipment and infrastructure were occasionally maintained (60.6%), while among the staff with first degrees, the highest percentage (42.9%) showed that the equipment and infrastructure were often maintained. A small number of the second-degree holders 3(9.1%) indicated that the ICT equipment and infrastructure were never maintained. According to the PhD holders, results revealed that a significant percentage of the staff said that the ICT equipment and infrastructure were often (50%) and occasionally (50%) maintained. These findings therefore imply that the ICT equipment and infrastructure in Kyambogo University may not be in good operational conditions, according to the qualifications of the academic staff.

Students' Responses Regarding the Availability of ICT Equipment and Infrastructure

Table 3.6, presents the frequency counts of students' responses in relation to the availability of ICT equipment and infrastructure in Kyambogo University.

Table 3.6: Variation Between Availability of ICT Equipment and Infrastructure and Background Information, According to the Students of Kyambogo University

Background Information		"Num facu	ber of co lty are ad refere	mputer lequate ences"	s in my for my	Т	Total	At lea	st one co stud	for five	Total		
of the		A	gree	Dis	agree	Freq	%	A	Agree		agree	Freq	%
Students		Freq	%	Freq	%			Freq	%	Freq	%	•	
Sex	Male	91	54.5%	76	45.5%	167	100.0%	90	53.9%	77	46.1%	167	100.0%
	Female	43	58.1%	31	41.9%	74	100.0%	34	46.6%	39	53.4%	73	100.0%
Age	19-24	65	47.1%	73	52.9%	138	100.0%	66	47.8%	72	52.2%	138	100.0%
	years												
	25-30	59	70.2%	25	29.8%	84	100.0%	50	60.2%	33	39.8%	83	100.0%
	years												
	31-36	5	45.5%	6	54.5%	11	100.0%	6	54.5%	5	45.5%	11	100.0%
	years												
	37	5	62.5%	3	37.5%	8	100.0%	3	37.5%	5	62.5%	8	100.0%
	vears+												

Responses According to the Sex of the Students

The responses according to the sex of the students exhibited the following characteristics: Among the males, the majority 91(54.5%) agreed that the computers were adequate for their reference studies. On the other hand, 43

(58.1%) females agreed with the same statement. Under the suggestions that at least one computer was available to five students, similarly a higher percentage of males (53.9%) agreed to the suggestion. With regard to female students, on the idea that the ratio of computers to the student users was 1:5 was however, contrary to that of the males. A higher percentage (53.4%) disagreed with the suggestion. In general, this finding provided that a bigger number of both male and female students agreed that the computers were available in adequate numbers and also that the ratio of the available computers was such that, it was 1:5. This presupposes that the students are able to make references during their studies using ICT applications.

Responses According to the Age of the Student Under the Availability of the ICT Equipment and Infrastructure

The trend of the responses with reference to the age of the students was such that those falling under age bracket 19-24 years constituted the largest number of the respondents, with a higher percentage (52.9%) disagreeing that the computers were adequate for their reference studies and also that the ratio of available computers was 1:5. The student-respondents aged between 25 and 30 years constituted a significant number, with a higher number agreeing to the suggestion that the computers were available in adequate numbers for references and also that the ratio of computers to student users was 1:5 (52.2%). A smaller number of the respondents to this item were in the age bracket of 31-36 years (11), with a significant percentage disagreeing (54.5%) and agreeing (54.5%) and that the ratio of the available computers to the number of student-users was 1:5, respectively. With regard to the respondents aged 37 years and above, they constituted an insignificant number, with however, a bigger percentage agreeing that the computers were adequate for reference studies but also disagreeing with the opinion that the ratio was 1:5.

From the above revelation, it can be noted that on the average, a bigger number of students according to age, agreed that the available computers were adequate for reference studies but disagreed that the available computers constituted the ratio of 1:5 in terms of computer-student ratio. This implies that students were able to use computers for their studies with constraints because of the unfavorable computer-student ratio.

Students' Responses on the Use of ICT Equipment and Infrastructure

Table 3.7 presents the responses of students on the use of ICT equipment and infrastructure in Kyambogo University.

Table 3.7:Variation Between use of ICT Equipment and Infrastructure and
Background Information, According to the Students of Kyambogo University

Background Information		U	se compu stue	ters for dies	r my	Т	otal	Use (computer informati assign	arce for ny	Total		
of the		Yes No		No	Fre	%	Agree		Dis	agree	Fre	%	
Students		Fre	%	Fre	%	q		Fre	%	Fre	%	q	
		q		q				q		q			
Sex	Male	88	52.7%	79	47.3%	167	100.0	100	59.9%	67	40.1%	167	100.0
							%						%
	Female	33	45.2%	40	54.8%	73	100.0	42	56.8%	32	43.2%	74	100.0
							%						%
Age	19-24	57	41.6%	80	58.4%	137	100.0	77	55.8%	61	44.2%	138	100.0
	years						%						%
	25-30	56	66.7%	28	33.3%	84	100.0	55	65.5%	29	34.5%	84	100.0
	years						%						%
	31-36	6	54.5%	5	45.5%	11	100.0	8	72.7%	3	27.3%	11	100.0
	years						%						%
	37	3	37.5%	5	62.5%	8	100.0	3	37.5%	5	62.5%	8	100.0
	years+						%						%

Responses According to the Sex of the Students

The findings on the opinions of students in relation to sex was that among the males, a somewhat higher percentage (52.7%) said that they used computers for their studies and 59.9 percent agreed that they used computers to source for information for their assignments. With regard to females, a significant percentage (54.8%) indicated that they did not use computers for their studies but agreed that they used computers for their assignments (56.8%). These findings therefore show that generally, more students used computers in their studies and assignment, suggesting that the functionality of ICT in Kyambogo University according to the sex of students is depicted by the use of computers for studies and assignments.

Responses According to the Age of Students

The results in relation to the age of the students presented the following scenario: the biggest number of students who responded to this question were aged between 19 and 24 years, followed by those aged between 25 and 30 years. The students falling in the age bracket 31-36 and 37+ years, formed smaller and insignificant numbers, respectively. Under the students of 19 - 24 years age bracket, a higher percentage (58.4%) disagreed that they used

computers for their studies. However, under the suggestion that they used computers for their assignments, a higher percentage agreed with the opinion (65.5%).

Among the students who fell in the age bracket of 25-30 years, a greater number accepted that they used computers for their studies. Similarly, a higher percentage of the students under the same age bracket revealed that they used computers for their assignments (65.5%). Regarding the findings on the students of 31-36 years of age, a higher percentage said that they used computers for both their studies and assignments.

Contrary to the scenario obtaining among the students falling under 19-24 years and 31-36 age brackets, a higher percentage of those falling under age bracket of 37 years and above, disagreed with the suggestion that they used computers for both their studies (62.5%) and assignments (62.5%). In this analysis, it can be noted that age of students revealed that a considerable number of students used computer for both their studies and assignments, presupposing that the functionality of ICT in Kyambogo University among students was noticeable.

Table 3.8 presents students' opinions in relation to the maintenance of ICT infrastructure in Kyambogo University.

Table 3.8: Variation Between Maintenance of ICT Equipment and Infrastructure and Background Information, According to the Students of Kyambogo University

Background Information		Ever tl becau	been inco ne use of ise of poo	onvenier comput r mana	nced by ters gement	T	`otal	Ever been inconvenienced by the status of computer pieces in terms of performance						
of the		Aş	gree	Dis	agree	Freq	%	Alv	ways	Occas	sionally	Som	Freq	
Students		Freq	%	Freq	%			Freq	%	Freq	%	Freq	%	-
Sex	Male	129	77.2%	38	22.8%	167	100.0%	49	29.5%	49	29.5%	68	41.0%	166
	Female	59	79.7%	15	20.3%	74	100.0%	22	30.1%	14	19.2%	37	50.7%	73

Responses According to the Sex of the Students

From table 3.8 above, it can be observed that within the male students, majority of both male (77.2%) and females (79.9%) were dissatisfied with the quality of maintenance of ICT equipment and infrastructure while 41% and 51.85, respectively had been sometimes been inconvenienced with the performance of computers. These findings therefore revealed that despite the availability of computers at in the campus faculties, they were in a sorry state.

Responses of the Top Management Regarding the Availability of ICT Equipment and Infrastructure

Table 3.9 presents the opinions of the top management in relation to the availability of ICT equipment and infrastructure.

Table 3.9: Variation Between Availability of ICT Equipment and Infrastructure and Background Information, According to the Top Management Officers of Kyambogo University

	Department	Total		Conc	Total		
Background	has an ICT						
Information	equipment						
of the Top	Yes	Freq	%	Functional	Not functional	Freq	%

100

Management Officers		Freq	%			Freq	%	Freq	%		
Sex	Male	5	100.0%	5	100.0%	3	60.0%	2	40.0%	5	100.0%
	Female	2	100.0%	2	100.0%	1	50.0%	1	50.0%	2	100.0%
Designation	VC	1	100.0%	1	100.0%	1	100.0%			1	100.0%
	DVC	1	100.0%	1	100.0%	1	100.0%			1	100.0%
	US	1	100.0%	1	100.0%			1	100.0%	1	100.0%
	AR	1	100.0%	1	100.0%			1	100.0%	1	100.0%
	DS	1	100.0%	1	100.0%			1	100.0%	1	100.0%
	DUS	1	100.0%	1	100.0%	1	100.0%			1	100.0%
	UL	1	100.0%	1	100.0%	1	100.0%			1	100.0%
Department	Administration	6	100.0%	6	100.0%	3	50.0%	3	50.0%	6	100.0%
	Library	1	100.0%	1	100.0%	1	100.0%			1	100.0%
Qualifications	Second degree	4	100.0%	4	100.0%	4	100.0%			4	100.0%
	PhD	3	100.0%	3	100.0%			3	100.0%	3	100.0%

Responses According to the Sex of the Top Management Officers

In table 3.9 above, all the male and female officers indicated that their departments had ICT equipment and infrastructure. With regard to the operating conditions of the equipment, findings revealed that among the males, majority (60%) indicated that the equipment and infrastructure were functional than that of those who said that they were not functional (40%); in the same way, an equal percentage of 50% females indicated that the equipment and infrastructure were both functional and non- functional; each operational condition was represented by one respondent. The scenario exhibited that the administrative departments had ICT equipment and infrastructure, most of which were in operational conditions. This presupposes that the top management officers are able to use ICT in the administrative activities.

Responses According to the Designation of the Top Management Officers

Findings with reference to the designation of the top management officers revealed that all the officers though represented by 100.0 % for each, had ICT

equipment and infrastructure. However, the scenario changed with regard to the operational condition of the equipment and infrastructure showing that according to the Vice Chancellor and his Deputy, together with the Deputy University Secretary and the University Librarian, the available equipment and infrastructure were functional while the University Secretary, together with the Academic Registrar and Dean of Students contradicted this position by revealing that the equipment and infrastructure were not functional. The Dean of Students and the University Librarian did not indicate whether or not the ICT equipment and infrastructure were non-functional. This therefore shows that the entire top management officers department had ICT although they seemed to contradict on its functionality.

Responses According to the Administrative Department

Findings under the department of the top management officers showed that all the administrative departments, including the University Library had ICT equipment and infrastructure. With regard to the operational conditions of the equipment and infrastructure, a significant percentage of the top management officers, including the University Librarian, provided that the equipment and infrastructure were functional, with the same percentage revealing that the equipment and infrastructure were not non-functional. These findings therefore presented that all the administrative departments, together with the University Library had computers, suggesting that the ICT equipment and infrastructure are crucial in these units for their operations.

Top Management Officers' Responses in Relation to Their Qualifications

The findings in relation to qualifications of the top management officers were such that a bigger number of the respondents had second degrees than that of those who had PhDs, though the percentages for each category of respondents were 100.0 % because all the respondents in their respective group responded to the item. Regarding the operational conditions of the ICT equipment and infrastructure, all the officers with second degrees indicated that they were functional while all the PhD holders revealed the contrary. This trend depicts that the use of the ICT equipment and infrastructure identifies with the officers who have second degrees probably because the nature of their duties calls for the use of the ICT applications more than that of those with PhDs, coupled with the scenario that second degree holders are a relatively bigger sample.

Top Management Officers' Views on the Usage of ICT Equipment and

Infrastructure

Table 3.10 presents the top management officers' responses on the use of ICT equipment and infrastructure in Kyambogo University.

Table 3.10: Variation Between use of ICT Equipment and Infrastructure and Background Information, According to the Top Management Officers of Kyambogo University

		Use ICT for day- to-day work				Total	
Background			Yes		No	Freq	%
Information of		Freq	%	Freq	%		
the Top							
Management							
Officers							
Sex	Male	4	80.0%	1	20.0%	5	100.0%
	Female	2	100.0%			2	100.0%
Designation	VC	1	100.0%			1	100.0%

	DVC	1	100.0%			1	100.0%
	US	1	100.0%			1	100.0%
	AR	1	100.0%			1	100.0%
	DS	1	100.0%			1	100.0%
	DUS	1	100.0%			1	100.0%
	UL			1	100.0%	1	100.0%
Department	Administration	6	100.0%			6	100.0%
	Library			1	100.0%	1	100.0%
Qualifications	Second degree	3	75.0%	1	25.0%	4	100.0%
	PhD	3	100.0%			3	100.0%

Responses According to the Sex of the Top Management Officers

From the above presentation, among the males, a higher percentage indicated that they used ICT for their day-to-day work; the only two females, who responded to the item like in the case of males, said that they used ICT for their daily work. This suggests that more male top management officers of Kyambogo University use ICT for their daily work than the female officers, apparently because there are more males at that position in the University than females. This depicts that according to sex, the ICT equipment and infrastructure are functional among the top management officers.

Responses According to the Designation of the Top Management Officers

Findings with designation of the top management officers showed that all the top management officers used ICT for their day-to-day work. However, the University Librarian disagreed with this position as he revealed that he did not use ICT in his day-to-day work. This implies that that all the top management officers except the University Librarian, used the ICT equipment and infrastructure for their day-to-day work, presupposing that the ICT equipment and infrastructure are available to the top management officers of the University. This however, contradicted the researcher's expectations: the

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University Librarian was expected to use ICT applications more than the other officers because of the nature of his work as an information manager.

Responses According to the Administrative Department

Findings with reference to the department of the top management officers showed that all the administrative departments, excluding the University Library, used ICT equipment and infrastructure in their departmental work. This scenario conforms to the previous findings that revealed that the University Librarian did not use the ICT for the daily work. This therefore presupposes that ICT use in the University Library is weaker than in the administrative units, a position that contradicts the requirements and expectations of a university library's operations.

With regard to the operational conditions of the ICT equipment and infrastructure, a significant percentage of the top management officers provided that the ICT equipment and infrastructure were functional, with the same percentage indicating that they were non-functional. The top management officers from the University Library however, revealed that the ICT equipment and infrastructure were functional.

This trend presented that all the administrative departments, together with the University Library had computers, suggesting that the ICT equipment and infrastructure are crucial in these units' operations.

Responses in Relation to the Qualifications of the Top Management Officers

Among the officers with second degrees, a higher percentage (75%) said that they used ICT for their day-to-day work. These findings presented that according to the qualifications, a bigger number of the officers used ICT for their work, implying that ICT use is critical for the daily managerial operations of Kyambogo University.

Responses of Top Management Officers on the Levels of ICT Applications

in use at Kyambogo University

Table 3.11 presents the frequency counts of top management officers opinions in relation to the levels of ICT applications in use.

Table 3.11:Variation Between Levels of ICT Applications in Use and Background Information, According to the Top Management Officers of Kyambogo University

Background In	formation of	the							
Top Manageme	nt								
			Levels of ICT Applications in use						
				Docum					
					ent				
			Commun	Electronic	Product	Enterta			
			ications	library	ion	inment			
Sex	Male	Freq		2(60,00/)	4(66.7	1(50.0			
		(%)	2(50.0%)	3(00.0%)	%)	%)			
	Female	Freq	2(50,00/)	2(40,0%)	2(33.3	1(50.0			
		(%)	2(50.0%)	2(40.0%)	%)	%)			
Total	Freq (%)		4(100.0%	E(100.00/)	6(100.0	2(100.0			
)	5(100.0%)	%)	%)			
Designation	VC	Freq	1(05,00/)	1(00,00/)	1(16.7	1(50.0			
		(%)	1(25.0%)	1(20.0%)	. %)	%)			
	DVC	Freq (%)		1(20.0%)					

	US	Freq	1(25.0%)	1(20.0%)	1(16.7	1(50.0
		(%)	、 ,	, ,	%)	%)
	AR	Freq			1(16.7	
		(%)			%)	
	DS	Freq			1(16.7	
		(%)			%)	
	DUS	Freq	1(05,00()	1(00,00())	1(16.7	
		(%)	1(25.0%)	1(20.0%)	%)	
	UL	Freq	1(05.0%)	1(00, 00/)	1(16.7	
		(%)	1(25.0%)	1(20.0%)	%)	
Total	Freq (%)		4(100.0%	5(100.0%)	6(100.0	2(100.0
)	3(100.070)	%)	%)
Department	Administra	Freq	2(75.00/)	4(80,00/)	5(83.3	2(100.0
	tion	(%)	3(75.0%)	4(00.0%)	%)	%)
	Library	Freq	1(05,0%)	1(00,0%)	1(16.7	
		(%)	1(25.0%)	1(20.0%)	%)	
Total	Freq (%)		4(100.0%	5(100.0%)	6(100.0	2(100.0
)	3(100.070)	%)	%)
Qualifications	Second	Freq	2(75,00/)	4(80,00/)	3(50.0	1(50.0
	degree	(%)	3(75.0%)	4(80.0%)	%)	%)
	PhD	Freq	1(05,00/)	1(00,0%)	3(50.0	1(50.0
		(%)	1(25.0%)	1(20.0%)	%)	%)
Total	Freq (%)		4(100.0%)	E(100.09/)	6(100.0	2(100.0
)	5(100.0%)	%)	%)

Responses According to the Sex of the Top Management Officers

The levels of ICT applications in use and the sex of the top management officers were as follows: under communications as a level of application, the responses exhibited that: an equal percentage of males and females used the levels of ICT applications in their work; there was a sizeable difference in the responses under use of electronic library as a level of ICT applications, revealing that a higher percentage of the top management officers who used electronic library were males (60%); use of ICT under document production/secretarial functions also indicated that a higher percentage of the users were males (66.7%); there was no variation under the use of ICT for entertainment as represented by the same percentages of both males and females (50%). Thus, these findings showed that the critical levels of ICT applications were in use at Kyambogo University, though predominantly by male officers. The predominance by males was because there were more male samples than female samples.

Furthermore scrutiny revealed that entertainment was not dominantly used among the top management officers may be because of the age: the officers were older than most study-participants in the four study-groups and, or the nature of duties as well as ethical values that could not permit the officers to predominate use of ICT under entertainment.

Responses According to the Designation of the Top Management Officers

Findings according to the designation of the top management officers presented the following scenario: under communications, the Vice Chancellor, University Secretary, Deputy University Secretary and University Librarian used the ICT applications; with regard to the electronic library, the Vice Chancellor and his deputy, together with the University Secretary, Deputy University Secretary and University Librarian used the ICT applications; the Vice Chancellor, University Secretary, the Academic Registrar, Dean of Students, Deputy University Secretary and University Librarian and used ICT applications for document production; ICT applications under entertainment was used by only the Vice Chancellor and the University Secretary.

This scenario presented the following contradictions: the Deputy Vice Chancellor did not use ICT for communications, document
production/secretarial functions and entertainment; the Academic Registrar did not use the ICT for communications, electronic library and entertainment. This trend suggests that the levels of ICT applications in use among the top management officers do not strictly relate to the nature of their work.

Responses According to the Departments

The variability between the levels of ICT applications in use and the department of the top management officers indicated that majority of the from the administration unit. Similarly, respondents were under communications a bigger number of the officers who used the ICT in their various levels, belonged to the administration unit; under electronic library, the administration unit still formed a higher percentage than the library and similarly with regard to the document production/secretarial functions, the scenario revealed that a higher percentage of the officers was that of those from the administration unit; only top management officers from the administration unit used ICT applications for entertainment.

The characteristics of these findings depicted that use of various levels of ICT applications was predominant in the administration unit of the University may be because only one respondent represented the library unit.

Responses According to the Qualifications of the Top Management Officers

The findings in relation to qualifications of the top management officers revealed that: officers with second degrees constituted a higher percentage of the respondents (75%) who used ICT for communications and PhD-holders formed a smaller percentage (25%). Similarly, a higher percentage of the officers who used ICT applications to access electronic library, had second degrees (80%) while a smaller percentage possessed PhDs (20%); under document production/secretarial functions and entertainment, respondents with second degrees and PhDs each constituted the same percentage (50%). The trend of these findings therefore, indicated that according to the qualifications of the top management officers, both the second degree and PhD holders constituted 50.0 % each, suggesting that use of various levels of ICT applications can be identified among the top management officers of Kyambogo University.

Responses of Top Management Officers in Relation to the Maintenance of ICT Equipment and Infrastructure (in the Offices)

Table 3.12 (a) presents top management officers' responses in relation to the maintenance of ICT equipment and infrastructure in Kyambogo University. The presentation is done in relation with the background information of the respondents.

Table 3.12 (a): Variation Between Maintenance of ICT Equipment and Infrastructure and Background Information, According to the Top management Officers of Kyambogo University

	"How often	are the ICT equ	ipment and	Тс		
Background	infrastructure maintained in your office"					
Information	Often Sometimes Always					

of the Top		Freq	%	Freq	%	Freq	%		
Management									
Officers									
Sex	Male	3	60.0%	2	40.0%			5	
	Female					1	100.0%	1	
Designation	VC	1	100.0%					1	
	DVC			1	100.0%			1	
	US					1	100.0%	1	
	AR	1	100.0%					1	
	DS	1	100.0%					1	
	UL			1	100.0%			1	
Department	Administration	3	60.0%	1	20.0%	1	20.0%	5	
	Library			1	100.0%			1	
Qualifications	Second degree	1	33.3%	2	66.7%			3	
	PhD	2	66.7%			1	33.3%	3	ſ

Responses According to the Sex of the Top Management Officers

In Table 3.12 (a), the responses with regard to the sex of the top management officers, indicated that: among the males, a greater percentage (60%) said that the ICT equipment and infrastructure were often maintained in the office, while a smaller percentage (40%) indicated that the equipment and infrastructure were sometimes maintained, with none indicating "always" as a frequency of maintenance.

The only female officer (the University Secretary), constituting 100.0 %, said that the equipment and infrastructure were always maintained. She elaborated that according to the work plan, the maintenance were to be carried out always. However, the findings underpin the fact that the maintenance is often carried out, presupposing that the ICT equipment and infrastructure used by the top management officers are functional.

Responses According to the Designation of the Top Management Officers

Findings with the designation of the top management officers revealed that: according to the Vice Chancellor, Academic Registrar and Dean of Students, the ICT equipment and infrastructure were often maintained (100%); on his part, the Deputy Vice Chancellor, together with the University Librarian presented that the equipment and infrastructure were sometimes maintained; only the University Secretary said that the ICT equipment and infrastructure in the University were always maintained. Thus, according to the significant number of the officers, the findings depicted that the equipment and infrastructure were often maintained presupposing that the ICT equipment and infrastructure in the University were operating well.

Responses According to the Departments

Among the officers who belonged to the administration unit, a higher percentage said that the ICT equipment and infrastructure were often maintained (60%) with insignificant percentages exhibiting that the equipment and infrastructure were both sometimes and always maintained (20%) respectively. The only respondent from the University Library constituting 100.0 % indicated that the ICT equipment and infrastructure were sometimes maintained. These findings like the previous ones under sex and designation corroborated that the ICT equipment and infrastructure were often maintained, suggesting that the equipment and infrastructure in Kyambogo University are functional.

Responses According to the Qualifications of the Top Management Officers

The findings in relation with the qualifications of the top management officers exhibited the following trend: the same number of second degree and PhD holders responded to the question, with a higher percentage of those possessing second degrees indicating that the equipment and infrastructure were sometimes maintained (66.7%), and a lower percentage showing that the equipment and infrastructure were often maintained (33.3%). Among the PhD holders however, a higher percentage (66.7%) presented that the equipment and infrastructure were often maintained. These findings showed that a bigger number of the officers said that the equipment and infrastructure were often maintained.

Responses of Top Management Officers in Relation to the Maintenance of ICT Equipment and Infrastructure (in the Departments)

Table 3.12 (b) presents the frequency counts of respondents' opinions regarding the maintenance of ICT equipment and infrastructure (in the offices) in Kyambogo University.

Table 3.12 (b): Variation Between Maintenance of ICT Equipment and Infrastructure and Background Information, According to the Top Management Officers of Kyambogo University

	"How often are the ICT	Total
Background	equipment and infrastructure	
Information of the	maintained in	
Top Management	in the departments?"	

Officers		0	Often	Son	netimes	Freq	%
		Freq	%	Freq	%		
Sex	Male	4	100.0%			4	100.0%
	Female	1	50.0%	1	50.0%	2	100.0%
Designation	VC	1	100.0%			1	100.0%
	DVC	1	100.0%			1	100.0%
	US			1	100.0%	1	100.0%
	DS	1	100.0%			1	100.0%
	DUS	1	100.0%			1	100.0%
	UL	1	100.0%			1	100.0%
Department	Administration	4	80.0%	1	20.0%	5	100.0%
	Library	1	100.0%			1	100.0%
Qualifications	Second degree	4	100.0%			4	100.0%
	PhD	1	50.0%	1	50.0%	2	100.0%

Responses According to the Sex of the Top Management Officers

The findings under gender of the top management officers depicted the following revelations: more males responded to the item than the females; the two female officers were divided in their opinions: one said that the ICT equipment and infrastructure were often maintained, while the other reported that they were sometimes maintained. The characteristics of the findings revealed that more respondents said that the ICT equipment and infrastructure were often maintained though predominated by the male officers. The scenario therefore suggests that the equipment and infrastructure are in good working conditions.

Responses According to the Designation of the Top Management Officers

According to the top management officers' point of view particularly: Vice Chancellor, Deputy Vice Chancellor, Dean of Students, Deputy University Secretary and the University Librarian, the ICT equipment and infrastructure were often maintained; only the University Secretary observed that the ICT equipment and infrastructure were sometimes maintained. This trend exhibited that the ICT equipment and infrastructure were often maintained in the departments and therefore suggesting that the equipment and infrastructure were in good functional conditions.

Responses According to the Department of the Top Management Officers

The majority of the officers 4 (80%) from the administration unit noted that the ICT equipment and infrastructure were often maintained, predetermining that the equipment and infrastructure were in operational conditions.

Responses According to the Qualifications of the Top Management Officers:

The findings according to the qualifications of the top management officers had the following characteristics: a bigger number of the officers had second degrees, with the majority among them revealing that the equipment and infrastructure were often maintained. Of the two PhD holders, one like in the case of the second-degree holders said that the equipment and infrastructure were often maintained and the other indicated that they were sometimes maintained. These findings conform to the previous ones, suggesting that equipment and infrastructure were in good working condition.

Responses of Top Management Officers on the Maintenance of ICT Equipment and Infrastructure (in the Library) in Kyambogo University Table 3.12 (c) presents the views of top management officers on the

maintenance of ICT Equipment and Infrastructure (in the Library) in Kyambogo

University.

Table 3.12(c): Variation Between Maintenance of ICT Equipment and Infrastructure and Background Information, According to the Top Management Officers (in the Library)

		"How	often a	re the IC	t and				
		inf	frastruc	ture ma	intain "	ed in t	he		- 4 - 1
				librai	y				otai
			ftan	Q time		A 1		Fre	07
D1		0.	lten	Somet	lines	AIW	ays	q	70
Backgro									
Top Mor									
Officers	llagement	Frog	Freq %		0/	Frog	0/		
Oncers	Mala	гтец	70	гтец		гтец	70		100
Sex	Male	3	75.0%	1	25.0			4	100.
	Formala				/0		50.0		100
	remale	1	50.0%			1	30.0 %	2	100. 0%
Designa	VC		100.0				70		100
tion	• •	1	%					1	0%
	DVC	_	100.0						100.
		1	%					1	0%
	US					1	100.	1	100.
						1	0%	1	0%
	DS	1	100.0					1	100.
		1	%					1	0%
	DUS	1	100.0					1	100.
		1	%					T	0%
	UL			1	100.			1	100.
				L	0%			T	0%
Depart	Administ	4	80.0%			1	20.0	5	100.
ment	ration	т	80.070			1	%	5	0%
	Library			1	100.			1	100.
				T	0%			1	0%
Qualific	Second	З	75.0%	1	25.0			4	100.
ations	degree	5	10.070	1	%				0%
	PhD	1	50.0%			1	50.0	2	100.
			55.070			1	%	4	0%

Responses According to the Sex of the Top Management Officers

The responses relating to the maintenance of ICT equipment and infrastructure (in the library) with the sex of the top management officers revealed that majority (75%) of male respondents indicated that the equipment and infrastructure were often maintained, with an insignificant number (25%) reporting that that the equipment and infrastructure were sometimes maintained. Within the two female officers, one indicated that the equipment and infrastructure were often maintained, while the other presented that they were sometimes maintained. The findings therefore showed that the ICT equipment and infrastructure were often maintained, depicting the trend that the ICT equipment and infrastructure were operational.

Responses According to the Designation of the Top Management Officers

Findings under the designation of the top management officers revealed the following characteristics: according to the Vice Chancellor, Deputy Vice Chancellor, Dean of Students and Deputy University Secretary, the ICT equipment and infrastructure were often maintained; only the University Librarian revealed that the ICT equipment and infrastructure were sometimes maintained; and only the University Secretary revealed that the ICT equipment and infrastructure were always maintained. The majority of the officers exhibited that the ICT equipment and infrastructure were often maintained, presupposing that they were in good operating conditions.

Responses According to the Department

Findings on the maintenance of ICT equipment and infrastructure with the department of the top management officers indicated that: Among the officers from the administrative unit, majority (80%) reported that the ICT equipment and infrastructure were often maintained. The only respondent (25%) from the library however, indicated that the equipment and infrastructure were sometimes maintained. This trend depicted therefore that the equipment and infrastructure were operating well.

Responses According to the Qualifications of the Top Management Officers

The findings showed that a bigger number of the officers that responded to this item had second degrees, with only two PhD holders. Within the holders of second degrees, a higher percentage (75%) said that the ICT equipment and infrastructure were often maintained, while among the two PhD holders, one showed that equipment and infrastructure were often maintained and the other reported that they were always maintained. Accordingly, the findings suggest that the ICT equipment and infrastructure were functional.

Responses of Senior Management Staff on the Availability of ICT Equipment and Infrastructure (in the Library) in Kyambogo University

Table 3.13 presents the responses of the senior management staff in relation to the availability of ICT equipment and infrastructure in Kyambogo University.

Table 3.13: Variation Between A Availability of ICT Equipment and Infrastructure and Background Information, According to the Senior Management Staff of Kyambogo University

Background Information of the Senior Management Staff		"Does	your depa ICT equi	artment pment?	have an "	Т	`otal	"if ye abov equ effec effec	es in (6) e, is the ipment tive and cient ?"	Т	otal
			Yes		No	Freq	%		Yes	Freq	%
		Freq	%	Freq	%	-		Freq	%	-	
				1							
Sex	Male	4	100.0%			4	100.0%	4	100.0%	4	100.0%
	Female	1	33.3%	2	66.7%	3	100.0%	2	100.0%	2	100.0%
Designation	AUS	1	100.0%			1	100.0%	1	100.0%	1	100.0%
	AAR			1	100.0%	1	100.0%	1	100.0%	1	100.0%
	SR.AUB	1	100.0%			1	100.0%	1	100.0%	1	100.0%
	SR.AR			1	100.0%	1	100.0%				
	AUB	1	100.0%			1	100.0%	1	100.0%	1	100.0%
	SR.AUS	1	100.0%			1	100.0%	1	100.0%	1	100.0%
	WARDEN	1	100.0%			1	100.0%	1	100.0%	1	100.0%
Department	Administration	5	71.4%	2	28.6%	7	100.0%	6	100.0%	6	100.0%
Qualifications	First degree	1	33.3%	2	66.7%	3	100.0%	2	100.0%	2	100.0%
	Second degree	4	100.0%			4	100.0%	4	100.0%	4	100.0%

Responses According to the Sex of the Senior Management Staff

The findings in relation to the sex of the senior management staff indicated that all the male and female staff reported that their departments had ICT equipment and infrastructure, with a higher percentage within females revealing the contrary. Under the effectiveness and efficiency of the equipment, results exhibited that: among the males, all of them indicated that the equipment and infrastructure were effective and efficient; a sizeable number among the females although indicated as 100.0 % presented that the equipment and infrastructure were effective and efficient. The findings therefore depicted that according to gender, the departments had ICT equipment and infrastructure and they were effective and efficient. This suggests that like the top management officers, the senior management staff is able to use ICT in the administrative activities of the University.

Responses in Relation to the Designation of the Senior Management Staff

Findings under this variable indicated that all the senior management staff reported availability and effectiveness of the ICT equipment and infrastructure in their respective departments (100%) with the exception of the Senior Assistant Academic Registrar (SAAR) who did not respond to the item. The trend therefore depicts that according to the designation of the senior management staff, the ICT equipment and infrastructure are not only available in Kyambogo University but are also effective and efficient.

Responses According to the Departments of the Senior Management Staff

The findings according to the department of the senior management staff were such that only staff from the administrative unit responded to this item, with the following characteristics: a greater percentage showed that the departments had ICT equipment and infrastructure (71.2%). With regard to the effectiveness and efficiency of the equipment and infrastructure, a greater percentage still reported that the equipment and infrastructure were effective and efficient (100%). These findings therefore imply that according to the administrative units of the University, the ICT equipment and infrastructure are critical for their operations.

Responses According to the Qualifications of the Senior Management Staff

The revelations under the qualifications showed that all the staff (4) with second degrees said that the departments had ICT equipment and infrastructure. Regarding the effectiveness and efficiency, a higher percentage of the staff revealed that the ICT equipment and infrastructure were effective and efficient, depicting that the University departments have effective and efficient ICT equipment and infrastructure for managerial operations.

Responses of the Senior Management Staff on the Use of ICT Equipment

and Infrastructure in Kyambogo University

In Table 3.14, the responses of the senior management officers in regard

to the use of the ICT equipment and infrastructure are presented.

Table 3.14: Variation Between Use of ICT Equipment and Infrastructure Background Information, According to the Senior Management Staff of Kyambogo University

Background Information of the Senior		"Are act schedule a	ivities in your e of duties ICT iided?"	Т	`otal
Management Staff			Yes	Freq	%
		Freq	%		
Sex	Male	4	100.0%	4	100.0%
	Female	3	100.0%	3	100.0%
Designation	AUS	1	100.0%	1	100.0%
	AAR	1	100.0%	1	100.0%
	SR.AUB	1	100.0%	1	100.0%
	SR.AR	1	100.0%	1	100.0%
	AUB	1	100.0%	1	100.0%
	SR.AUS	1	100.0%	1	100.0%
	WARDEN	1	100.0%	1	100.0%
Department	Administration	7	100.0%	7	100.0%
Qualifications	First degree	3	100.0%	3	100.0%
	Second degree	4	100.0%	4	100.0%

Responses According to the Sex of the Senior Management Staff

The responses in Table 3.14 showed that all senior management staff (males and females) that responded to the item maintained that their duties were ICT-aided. This suggests that Kyambogo University senior staff use ICT equipment and infrastructure for their duties.

Responses According to the Designation of the Senior Management Staff

Findings on the designation of the senior management staff indicated that: all the senior management staff (100%) that responded to the question said their work schedules called for the ICT mediation. These findings therefore depicted that all the senior management staff used the ICT for their daily work, implying that ICT mediation is crucial to the nature of the duties of the senior management staff of Kyambogo University.

Responses According to the Department of the Senior Management Staff

The findings under the department of the senior management staff revealed that only respondents from the administrative units reacted to this item, with the scenario that all the staff said that their activities were ICTaided. This therefore presupposes that use of ICT in Kyambogo University is critical to the duties of the senior management staff.

Responses According to the Qualifications of the Senior Management Staff

The opinions of the senior management staff with reference to their qualifications showed that all the respondents indicated that their activities were ICT-aided. This also shows that ICT use is critical for the daily managerial operations of the senior management staff of Kyambogo University.

Responses of the Senior Management Staff on the Levels of ICT Applications in use in Kyambogo University Table 3.15, presents the opinions of the participants in this research who

in this context happened to be senior management officers, with regard to the

levels of ICT applications in use.

Table 3.15: Variation Between Levels of ICT Applications in use and Background Information, According to the Senior Management Staff of Kyambogo University

Background Infor	mation of t	he	Lev	els of ICT	Application	s in 1196
Semor Management Stan			Secretari	Commi	Resource	Entertainme
			al	nicatio	centre e.g.	nt e.g.
			function	ns e.g.	digital	plaving
			S	e-mail	library	games
Sex	Male	Fre q	4(57.1%)	2(66.7 %)	1(50.0%)	2(66.7%)
	Female	Fre q	3(42.9%)	1(33.3 %)	1(50.0%)	1(33.3%)
Total	Freq		7(100.0 %)	3(100.0 %)	2(100.0%)	3(100.0%)
Designation	AUS	Fre q	1(14.3%)	1(33.3 %)	1(50.0%)	1(33.3%)
	AAR	Fre q	1(14.3%)	1(33.3 %)	1(50.0%)	1(33.3%)
	SR.AUB	Fre q	1(14.3%)	1(33.3 %)	 	1(33.3%)
	SR.AR	Fre q	1(14.3%)			
	AUB	Fre q	1(14.3%)			
	SR.AUS	Fre q	1(14.3%)			
	WARDE N	Fre q	1(14.3%)			
Total	Freq		7(100.0 %)	3(100.0 %)	2(100.0%)	3(100.0%)
Department	Adminis tration	Fre q	7(100.0 %)	3(100.0 %)	2(100.0%)	3(100.0%)
Total	Freq		7(100.0 %)	3(100.0 %)	2(100.0%)	3(100.0%)
Qualifications	First degree	Fre q	3(42.9%)	1(33.3 %)	1(50.0%)	1(33.3%)
	Second degree	Fre q	4(57.1%)	2(66.7 %)	1(50.0%)	2(66.7%)
Total	Freq		7(100.0%)	3(100.0 %)	2(100.0%)	3(100.0%)

Responses According to the Sex of the Senior Management Staff

The responses according to the sex of the senior management staff presented the following characteristics: use of ICT under document production/secretarial functions indicated that a higher percentage of the users were males than that of the females; under communications as a level of ICT applications, the findings also exhibited that a higher percentage of males than that of females used this level in their work; an equal percentage of both males and females said that they used ICT applications to access the digital library; there was a big variation under the use of ICT applications for entertainment as represented by a higher percentage of males using ICT applications for entertainment than that of females.

These findings depicted that save for the entertainment, the critical levels of ICT applications were in use at Kyambogo University, though predominantly by the male staff. The predominance by the males was because there was slightly more male staff in the study sample than the females. Further interpretation of the findings provided that more males used ICT applications for entertainment than the females, implying that female staff unlike their male colleagues, uses the applications for duties critical to the University's managerial operations.

Responses According to the Designation of the Senior Management Staff

The findings according to the designation of the senior management staff depicted the following scenario: Assistant Academic Registrar (AAR), Assistant University Bursar (AUB), Assistant University Secretary (AUS), Senior Assistant Academic Registrar (SAAR), Senior Assistant University Bursar (SAUB), Senior Assistant University Secretary (SAUS) and Warden indicated that they used ICT document production/secretarial functions: applications for under communications, only the Assistant Academic Registrar, Assistant University Secretary and Senior Assistant University Bursar used ICT applications; only the Assistant Academic Registrar used the ICT applications to access the digital library; and use of ICT applications for entertainment was carried out by the Assistant Academic Registrar and the Senior Assistant University Bursar.

This trend exhibits that the levels of ICT applications in use among the senior management staff, like in the case of the top management officers, do not strictly relate to the nature of their work, according to the designation of the senior management staff.

Responses According to the Departments of the Senior Management Staff

With regard to the department of the senior management staff, the results indicated that all the senior staff-respondents (100%) were from the administration unit, with the following findings: a big number (7) of the staff indicated that they used ICT applications for document production/secretarial functions, with some respondents (3) revealing that they used the applications for communications and an insignificant number showing that the ICT

applications were used to access the digital library and playing games (1). The characteristics of these findings presented that the senior management staff made use of the crucial levels of ICT applications.

Responses According to the Qualifications of the Senior Management Staff

In Table 3.15, the results show that the levels of ICT applications in relation to qualifications of the senior management staff were such that: a slightly bigger number of the respondents was constituted by those who possessed second degrees; within the second-degree holders, the biggest number said that they used ICT applications for secretarial functions and smaller numbers indicated that they used the applications for communications, entertainment and to access digital library; among the firstdegree holders a significant reported that they used the applications for secretarial functions with insignificant numbers exhibiting that the applications were under communications, entertainment and for accessing the digital library. The findings therefore indicated that according to the qualifications of the senior management staff, both the first and second-degree holders used the ICT applications for activities ideal for managerial functions, presupposing that use of various levels of ICT applications just like in the case of the top management officers of the University, can also be identified among the senior management staff.

Responses of the Senior Management Staff on the Maintenance of ICT

Equipment and Infrastructure in Kyambogo University

Table 3.16, presents the findings on the maintenance of ICT equipment and infrastructure among the senior management staff of Kyambogo University.

Table 3.16: Variation Between Maintenance of ICT Equipment and Infrastructure and Management, According to the Senior Management Staff of Kyambogo University

Background Information of the Senior Management		"A equ infras main	re ICT ipment and structure tained?"	1	Cotal	"if ye	s, are the	y maint "	ained	T	`otal
Staff			Yes	Freq	%	(Often	Occa	sionally	Freq	%
		Freq	%	1		Freq	%	Freq	%	1	
		-						-			
Sex	Male	4	100.0%	4	100.0%	4	100.0%			4	100.0%
	Female	3	100.0%	3	100.0%	2	66.7%	1	33.3%	3	100.0%
Designation	AUS	1	100.0%	1	100.0%	1	100.0%			1	100.0%
	AAR	1	100.0%	1	100.0%			1	100.0%	1	100.0%
	SR.AUB	1	100.0%	1	100.0%	1	100.0%			1	100.0%
	SR.AR	1	100.0%	1	100.0%	1	100.0%			1	100.0%
	AUB	1	100.0%	1	100.0%	1	100.0%			1	100.0%
	SR.AUS	1	100.0%	1	100.0%	1	100.0%			1	100.0%
	WARDEN	1	100.0%	1	100.0%	1	100.0%			1	100.0%
Department	Administration	7	100.0%	7	100.0%	6	85.7%	1	14.3%	7	100.0%
Qualifications	First degree	3	100.0%	3	100.0%	2	66.7%	1	33.3%	3	100.0%
	Second degree	4	100.0%	4	100.0%	4	100.0%			4	100.0%

Responses According to the Sex of the Senior Management Staff

The views of the senior management staff in relation to sex revealed the following scenario: about the same number of males and females responded to this question; all (4) the males, who responded to this item presented that the ICT equipment and infrastructure were often maintained, with none indicating "occasionally" as a possible frequency of maintenance; among the female staff respondents, a higher percentage revealed that the maintenance was often carried out (66%), with a lower percentage providing that the ICT

equipment and infrastructure was occasionally maintained (33.3%). The findings however, underpin the fact that the maintenance is often carried out, implying that the ICT equipment and infrastructure are used by the senior management staff in the execution of their duties.

Responses According to the Designation of the Senior Management Staff

The findings in relation to the designation of the senior management staff depicted the following trend: the Assistant University Secretary, Assistant Academic Registrar, Assistant University Bursar, Senior Assistant University Secretary and Warden, agreed that the ICT equipment and infrastructure were always maintained, with only the Assistant Academic Registrar saying that the equipment and infrastructure were occasionally maintained while the rest reporting that the maintenance was often carried out. The findings seemed to indicate that the equipment and infrastructure were often maintained, presupposing that the ICT equipment and infrastructure in the University were operational.

Responses According to the Department of the Senior Management Staff

The findings with regard to the department of the senior management staff revealed that: all the staff that responded to this item belonged to the administration unit and the majority of them (85.7%) reported that the ICT equipment and infrastructure were often maintained. These findings align with those under sex and designation, implying that the equipment and infrastructure in Kyambogo University are functional.

Responses According to the Qualifications of the of Senior Management Staff

Under the qualifications of the senior management staff, the results showed that: about the same number of the first and second-degree holders responded to the question, with all the respondents who possessed second degrees revealing that the equipment and infrastructure were often maintained; among the first-degree holders, a higher percentage (66.7%) reported that the ICT equipment and infrastructure were often maintained and a lesser percentage (33.3%)showing that the equipment and infrastructure were occasionally maintained. The results showed that majority of the staff reported that the ICT equipment and infrastructure were often maintained and therefore, suggesting that they are in good operational conditions.

SECTION TWO: DESCRIPTION OF THE VARIATION OF MANAGEMENT WITH THE BACKGROUND VARIABLES OF THE RESPONDENTS

This section presents the variation of the Dependent Variable (management) with the background information of the respondents. Before moving to the substantive issue of verification of hypotheses, it is appropriate to provide a description of how composite indices were created from every item of the questionnaire dealing with a specific objective.

Extreme positive responses (such as Agree, True or Yes) were assigned higher scores (1) and low scores (0) were allotted to negative responses (such as Disagree, False or No). Accordingly, these responses were totaled to generate composite indices for the independent and dependent variable for statements of the questionnaire dealing with each of the variables (independent and dependent variables). The creation of composite indices enabled the researcher to show how the Dependent Variable varied according to the different background variables for each group of the respondents.

ACADEMIC STAFF

Variability Between Management and Sex of the Academic staff

Table 3.17 reveals how management varies with sex according to the academic staff of Kyambogo University.

Table	3.17:	Variation	Between	Management	and	Sex,	According	to	the
Acade	mic Sta	aff of Kyaml	bogo Unive	ersity					

					Std.		
				Std.	Error		
Sex		Ν	Mean	Deviation	Mean	t	р
Management	Male	29	7.1724	4.18389	.77693	2 4 9 5	017
	Female	13	10.3846	2.95912	.82071	2.493	.017

This table indicates the mean differences in relation to sex and management among the academic staff. From the table, the mean for females was higher (10.3846) compared to that of their male counterparts (7.1724), which suggests that with the use of ICT in the management aspects, females dominated use of ICT more than the males. From the table, the computed value of the t-test is statistically significant i.e. (0.017 < 0.05) and therefore the variation shows that there

is a statistically significant relationship between sex and management among the academic staff.

Variability Between Management and Designation of the Academic staff

Table 3.18 presents variability between management and designation of the academic staff of Kyambogo University.

					Std.	t	р
				Std.	Error		
Designatio	on	Ν	Mean	Deviation	Mean		
Managem	Lecturer	40	8.350	4 03542	63806		
ent		10	0	1.00012	.00000	1.309	
	Senior	0	4.500	4 0 4055	0 50000		.198
	Lecturer	2	0	4.94975	3.50000		

Table 3.18: Variation Between Management and Designation, According to the Academic Staff of Kyambogo University

According to this table, the lecturers had a higher mean (8.3500) than the senior lecturers (4.5000) in terms of the variation between the management and designation of the academic staff. However, contrary to the researcher's expectations, the differences in the means were not significant (p>.05) implying that among the academic staff of Kyambogo University, designation is not related to management.

Variability Between Management and Faculty Among the Academic

Staff

ANOVA Table 3.19 presents how management varies according to the faculties among the academic staff of Kyambogo University.

Table 3.19: Summary of ANOVA Table Showing Mean Variation Between Management and Faculties, According to the Academic Staff of Kyambogo University

Faculty	Ν	Mean	F	р
Arts & Social Sciences	2	5.5000		
Engineering	8	6.0000	2.15	.110
Education	30	9.1333	1	
Vocational Studies	2	5.0000		
Total	42	8.1667		

This table shows that the means of the responses among the academic staff according to their faculties were highest among staff of the faculty of education, followed by those of the faculty of engineering, then faculty of arts and social sciences with vocational studies having the lowest. Using the ANOVA test to determine whether there were differences in the means with respect to faculty, the p-value for the F-statistic was greater than the alpha-value of 0.05, i.e. 0.110 > 0.05. Hence, management of the University did not vary with faculties of the academic staff, which implies that management is the same across all the faculties.

Variability Between Management and Qualifications Among the Academic staff

The following table provides the means of management with qualifications among the academic staff of Kyambogo University.

Table 3.20: Variation Between Management and Qualifications, According to the Academic Staff of Kyambogo University

	N	Mean	F	Р
First degree	7	9.8571		
Second degree	33	7.7879		
PhD	2	8.5000	.734	.486
Total	42	8.1667		

Table 3.20 shows that the means of the responses among the academic staff according to their qualifications were highest among those with first degrees, followed by those with PhDs. The staff with the second degrees had the lowest mean. Looking at the p-value (.486) for the F-statistic (.734) in the ANOVA test to determine the statistical significance in the variation between management and qualifications among the academic staff, there were no

significant differences in the means (0.486 > 0.05), implying that management does not depend on the qualifications of the academic staff.

STUDENT RESPONDENTS

Variation of Management with Sex Among Students

Table 3.21 shows the variation between management and sex among the students of Kyambogo University.

				Std.		
				Error		
Sex		Ν	Mean	Mean	t	р
Management	Male	167	7.5868	.37797		
	Female	74	7.5405	.54293	069	.945

Table 3.21: Variation Between Management and Sex, According to the Students of Kyambogo University

This table reveals that the variation of management with sex among the students was higher among the male than the female. The mean for the male was 7.5868 while that of females was 7.5405, suggesting that the difference was negligible. The table also presents the value of the t-test of the variation between management and sex among the student-respondents. From the

table, the p-value (0.945) is greater than the alpha level of significance of 0.05, i.e. 0.945 > 0.05. Hence, gender and use of ICT in the management aspects are not significantly related according to the students.

Variability of Management with Age Among Students

The variation between management and age among the studentrespondents was determined by running ANOVA test and the results are presented in table 3.22.

Table 3.22: Variation Between Management and Age, According to the Students of Kyambogo University

	N	Mean	F	р
19-24 years	138	7.4783		
25-30 years	84	7.9405		
31-36 years	11	6.8182	.402	.752
37 years+	8	6.5000		
Total	241	7.5768		

Table 3.22 presents that the means for the responses among the students according to their age were highest among those aged between 25 and 30, followed by those of between 19 and 24, then those of the 31-36 years old. Students of 37 + years of age had the lowest mean. From the table, the differences in the means were insignificant (p >.05), implying that according to students, management does not vary with age. The variation between

management and age like in the case of sex was not statistically significant according to the students.

Variability of Management with Course of Study Among Students

ANOVA test was run to determine variability in the management and course of study among the student-respondents and the results are presented in the following table:

Course	Ν	Mean	F	p
Education	130	8.2385		
ARTS & SSC	16	7.7500		
BG&C	4	5.7500		
BAA	1	11.0000		
Engineering	46	5.8913	1.560	.148
BDS	2	10.0000		
Vocational Studies	24	6.5417		
Sciences	20	7.5500		
Total	243	7.5226		

Table 3.23: Variation Between Management and Course, According to Students of Kyambogo University

This table indicates that the means for the responses among the students according to their courses of study were highest among the Bachelor of Arts degree (BAA) students, followed by the students studying for Bachelor of Development Studies degree (BDS), then Education students, who were followed by Arts in Social Sciences (ARTS & SSC), Sciences and Vocational Studies in that order. The students of Guidance and Counseling (BGC) had the lowest mean. The table exhibits that the sig-value (0.148) of F-statistic (1.560) was insignificant, i.e. 0.148 > 0.05. From this analysis, the variability in the management and course, like in the case of age and Sex was not statistically significant according to students.

Variability of Management with Qualifications Among Students

To determine variability in the management and qualifications (at the time of joining the University) among the student-respondents, ANOVA was run and the results are presented in Table 3.24.

Joining the University, According to the Students of Kyambogo University	
"A" Level , or Mature Age	

Table 3.24: Variation Between Management and Oualifications at the Time of

"A" Level , or Mature Age	147	7.0272	
Entry Certificate			
Diploma	95	8.2632	2.04 .132
First degree	1	10.0000	6
Total	243	7.5226	

This table provides that the means for the responses among the students according to their qualifications at the time they joined the University, were highest among those with first degrees, followed by the students who possessed diplomas. The students with Advanced Level Certificate of Education (A-Level), or Mature Age Entry Certificate, had the lowest mean. However, the observed differences in the means were not statistically significant at 0.05 level of significance (.132 > .05). Hence qualifications of students at the time of joining the University were not related to the management of Kyambogo University.

TOP MANAGEMENT OFFICERS

Variability of Management with Sex According to the Top Management Officers

Table 3.25 reveals how management varies with sex according to the Top Management Officers of Kyambogo University.

Table 3.25: Variation Between Management and Sex, According to the Top Management Officers Of Kyambogo University

	Sex	Ν	Mean	t	р
Management	Male	4	10.0000		
	Female	2	12.0000	946	.399

According to Table 3.25, females had a higher mean (12.0000) than the males (10.0000) in terms of the variation between the management and sex of the Top Management Officers. Never the less, the results of the independent sample t-test were not significant (i.e. 0.399 > 0.05). This concurs with the researcher's expectations that management of Kyambogo University and sex among the Top Management Officers are independent.

Variability of Management with Department Among Top Management Officers

Table 3.26 reveals how management varies with department according to the Top Management Officers of Kyambogo University.

Table 3.26: Variation Between Management and Department, According to the Top Management Officers of Kyambogo University

	Department	Ν	Mean	t	р
Management	Administration	5	11.6000		
	Library	1	6.0000	5.715	.005

Table 3.26 reveals that the Top Management Officers of the administration department had a higher mean (11.6) than those of the library (6.0) in terms of the variation between the management and department.

The results of the variation between management and department among the Top Management Officers of Kyambogo University indicate that the means of the responses of the Top Management Officers from table 3.26, were statistically significant at 0.05 level of significance

(0.005 < 0.05). This concurs with the researcher's expectations that department among the Top Management Officers is related to the management of Kyambogo University.

Variability of Management with Qualifications Among Top Management Officers

Table 3.27 presents variation between management and qualifications of the Top Management Officers of Kyambogo University.

Table 3.27: Variation Between Management and Qualifications, According to the Top Management Officers of Kyambogo University

Qualifications	Ν	Mean	t	р
Second degree	4	10.0000	- .943	.399
PhD	2	12.0000		

This table indicates that PhD holders among the Top Management Officers of the University had a higher mean (12.0000) than second-degree holders (10.0000) in terms of variability between management and qualifications. However, the computed value of the t-test (-.943) was insignificant at alpha .05, which means that qualifications have nothing to do with the management of Kyambogo University, according to the Top Management Officers.

SENIOR MANAGEMENT STAFF

Variability of Management with Sex Among Senior Management Staff

Variation between management and sex among the senior management staff of Kyambogo University is presented in the following table:

Table 3.28: Variation Between Management and Sex, According to the Senior Management Staff of Kyambogo University

	Sex	N	Mean	t	Р
MANAGEMENT	Male	4	13.0000		
	Female	3	6.6667	2.015	.100

Table 3.28 shows that males had a higher mean (13.) than the females (6.6667) in terms of the variation between the management and sex of the senior management staff of the University. However, despite the observed variations in the means, the computed p-value (.100) was greater than the level of significance .05 at which the null hypothesis was tested. Thus, according to senior management staff, management does not depend on gender.

Variability of Management with Qualifications Among Senior Management Staff

The variation between management and qualifications among the senior management staff of Kyambogo University is presented in Table 3.29.

Table 3.29: Variation Between Management and Qualifications, According to the Senior Management Staff of Kyambogo University

Qualifications		Ν	Mean	t	Р
MANAGEMENT	First degree	3	6.6667	-2.015	.100
	Second	4	13.0000		
	degree				

Table 3.29 presents that senior management staff with second degrees had a higher mean (13.) than those with first degrees (6.6667) in terms of the variation between the management and qualifications of the senior management staff of the University. With the p-value of .100, the variation in the means were not statistically significant which means that qualifications of senior management staff do not significantly play a vital role towards effective management of the University in question.

Variation Between Management and Designation and Department, According to the Senior Management Staff of Kyambogo University

Table 3.30 presents findings on how management of Kyambogo University varies with the designation and department under the senior management staff. The variation according to sex and qualifications has already been discussed under Tables 3.28 and 3.29.

Table 3.30: Variation Between Management and Designation and Department, According to the Senior Management Staff of Kyambogo University

Attitude of users of ICT towards ICT Applications Under Senior Management Staff					
		Freq	%		
Sex	Male	4	57.1%		
	Female	3	42.9%		
Designation	AUS	1	14.3%		
	AAR	1	14.3%		

SR.AUB114.3%SR.AAR114.3%AUB114.3%AUB114.3%SR.AUS114.3%WARDEN114.3%DepartmentAdministration7Academic QualificationsFirst degree342.9%Second degree457.1%				
SR.AAR114.3%AUB114.3%AUB114.3%SR.AUS114.3%WARDEN114.3%DepartmentAdministration7Academic QualificationsFirst degree342.9%Second degree457.1%		SR.AUB	1	14.3%
AUB114.3%SR.AUS114.3%WARDEN114.3%DepartmentAdministration7Academic QualificationsFirst degree3Second degree457.1%		SR.AAR	1	14.3%
SR.AUS114.3%WARDEN114.3%DepartmentAdministration7100.0%Academic QualificationsFirst degree342.9%Second degree457.1%		AUB	1	14.3%
WARDEN114.3%DepartmentAdministration7100.0%Academic QualificationsFirst degree342.9%Second degree457.1%		SR.AUS	1	14.3%
DepartmentAdministration7100.0%Academic QualificationsFirst degree342.9%Second degree457.1%		WARDEN	1	14.3%
Academic Qualifications First degree 3 42.9% Second degree 4 57.1%	Department	Administration	7	100.0%
Second degree 4 57.1%	Academic Qualifications	First degree	3	42.9%
		Second degree	4	57.1%

The t-test for the variability in the management with designation and department according to the senior management staff could not be computed because of the inadequate numbers of responses to generate the means for the responses.

SECTION THREE: VERIFICATION OF THE HYPOTHESES

This section presents findings according to the hypotheses cited in chapter one. The hypotheses were verified and not the research questions because the study had as many research questions as hypotheses and therefore, it was ideal that the hypotheses were verified and not the research questions (Amin, 2005).

Test of the first Hypothesis
The null hypothesis stated: "The management of Kyambogo University is not related to the availability of ICT equipment and infrastructure."

A t-test analysis was run on the students' responses on the availability of ICT equipment and infrastructure (Q9) against management aspects to test whether there were significant differences in management aspects and availability of ICT equipment and infrastructure. The results are summarised in the Table 3.31 below.

Table 3.31: Summary of Means and Standard Deviations of the Management Aspects and Availability of ICT Equipment and Infrastructure in Kyambogo University, According to the Students

At least one computer			Std.	t	р
for five	Ν	Mean	Deviation		
Agree	125	9.7360	3.81877	8.25	.000
Disagree	117	5.2222	4.67036		

The results from Table 3.31 show that the means for the management aspects in the faculties with at least one computer for five students was higher than those with less than one ICT equipment. The results of the t-test as summarised in the table show that there is a statistically significant difference in the means for the management aspects between faculties with at least one computer for every five students (.000 <. 05) implying that availability of ICT equipment and infrastructure is related to the management of the University. Thus based on the students' responses, the analysis and interpretation of the findings led to the rejection of the null hypothesis in favour of the research hypothesis.

Similarly, the academic staff responses on the availability of ICT equipment and infrastructure (Q6) were correlated with the composite index on the management aspects using a t-test for independent samples and the results are presented in Table 3.32.

Table 3.32: Summary of Means and Standard Deviations of the Coefficients of Management Aspects and Availability of ICT Equipment and Infrastructure in the Management of Kyambogo University, According to the Academic Staff

					t	р
ICT	equipment			Std.		
available		Ν	Mean	Deviation		

Yes	36	8.694 4	3.97722	2.130	.039
No	6	5.000 0	3.57771		

The results from Table 3.32, above seem to show that availability of ICT equipment influences the management of the University. This is indicated by the higher average for the faculties with ICT equipment. From the table, the observed differences in the means were statistically significant as shown by the p-value for the t-statistics being less than the level of significance i.e. (.039<0.05). The results from this test also exhibit that availability of ICT equipment and infrastructure in Kyambogo University relates to the management of the University and hence the null hypothesis was rejected in favour of the alternative.

From both the students' and academic staff's points of view, the null hypothesis was rejected. This suggests that the availability of equipment and infrastructure as a functionality of ICT, affects management of the University.

Table: 3.33 Summary of Means and Standard Deviations of the Coefficients of Management Aspects and Availability of ICT Equipment in the Management of Kyambogo University, According to the Senior Management Staff

				t	р
Department has an ICT			Std.		
Equipment	Ν	Mean	Deviation		

MANAGEMENT	Yes	5	13.00 00	.00000	5.130	.004
	No	2	3.500 0	4.94975		

According to the above data presentation, the mean score of the senior management staff show that there is significant relationship between the availability of ICT equipment and infrastructure and the management of the University. This was exhibited by a higher mean value of the administrative departments with ICT equipment.

Accordingly, the value of the t-test (13.000 and 3.500) was statistically significant (.004<0.05). Thus, the results from this test indicate that availability of ICT equipment and infrastructure relates to the management of Kyambogo University. Hence, the null hypothesis was rejected.

Test of the Second Hypothesis

The second null hypothesis stated: "Management of Kyambogo University is not related to the use of ICT." To test the null hypothesis, items 9 and 10 from both academic staff and students' questionnaires were used, respectively. The results are as shown below.

A t-test technique was run on the students' responses on the use of ICT (Q10) against the composite index for the management aspects to test whether there were significant differences in the management aspects and use of ICT. The results are summarised in the Table 3.34.

		_	_	Std.	t	р
ICT use		Ν	Mean	Deviation		
	Yes	100	9.024	1 308/17	5.07	000
		144	6	4.39047		.000
	No	100	6.025	4 50055		
		120	0	4.78875		

Table 3.34: Summary of the Means and Standard Deviations on the use of ICT and the Management, According to the Students of Kyambogo University

From this table, the means for the students' responses on those who use computers in their studies was higher than that of those who did not use the computer system in their studies. A t-test analysis was run to find out whether the means were statistically different across the two groups against the management aspects and looking at the calculated value of the t-test (5.07), the p-value of 0.000 was less than. 05. These results were statistically significant implying that students' use of ICT has an effect on the management of the University. According to the responses from the student respondents therefore, the null hypothesis was rejected and research hypothesis upheld.

In the same vein, the academic staff responses (Q9) on the use of ICT were correlated with the composite index on the management aspects using a t-test and the results are presented in the table 3.35.

Table 3.35: Summary of the Means and Standard Deviations on the use of ICT and the Management, According to the Academic Staff of Kyambogo University

			Std.	t	р
	Ν	Mean	Deviation		
Yes	30	8.466 7	4.27288	.746	.460
No	12	7.416 7	3.67939		

The findings under Table 3.35 present that the mean value for the academic staff responses on the use of ICT in the management activities, is higher than that of those who responded otherwise. However, the means from table 3.35 were not statistically significant. This was indicated by the p-value of the t-test greater than the pre- determined

level of significance alpha 0.05, i.e. 0.460 > 0.05. Contrary to the findings from students' analysis, the results for academic staff revealed that use of ICT in Kyambogo has no significant effect on the management of the University. The null hypothesis was therefore upheld. This implies that based on the academic staff responses, management of Kyambogo University do not differ in relation to the use of ICT.

Table 3.36: Summary of the Means and Standard Deviations on the use of ICT and the Management, According to the Top Management Officers of Kyambogo University

				Std.	t	p
						F
Use ICT for d	lay today work	Ν	Mean	Deviation		
Management	Yes	5	11.6000	.89443	5.715	.005
	No	1	6 0000	00000		
	NO	1	6.0000	.00000		
Use ICT for d	lay today work Yes No	N 5 1	Mean 11.6000 6.0000	Deviation .89443 .00000	5.715	.005

The findings under Table 3.36 show that the mean value for the responses of the top management officers on the use of ICT in the management activities is higher than that of those who responded otherwise. The calculated value of the t-statistic was 5.715 and the probability-value of 0.005, being less than the alpha-value (0.05) i.e. 0.005<0.05). The results were for that reason statistically significant implying that top management officers' use of ICT has a significant effect on the management of the University. The null hypothesis was therefore rejected.

Test of the Third Hypotheses

The third null hypothesis stated: "Management of Kyambogo University is not related to the Levels of ICT applications in use." Questions 10 and 13 from the academic staff and students' questionnaire respectively, were used to test this hypothesis. These questions had sub-components where a respondent had to tick whether s/he agrees or disagrees with each of the levels in use. A code of 1 (one) was given to a respondent who ticked Yes/Agree and a Zero otherwise.

The responses were then added to get an overall score for each of the respondent.

Subsequently, the scores were categorized into three, i.e. 0-2, 3-5 and 6-9.

A non-parametric alternative Kruskal-Wallis test was used to establish whether levels of ICT in use had any significant effect on the management of the University.

The Kruskal-Wallis technique was opted for because the homogeneity assumption of ANOVA was violated. The results of the analysis are presented in Table 3.37.

Table 3.37: Summary of the Mean Ranks on Different Levels of ICT Applications in use, According to the Students of Kyambogo University

			Mean
Levels of ICT in use		Ν	Rank
Management	0-2	69	97.06
	3-5	83	133.01
	6-9	86	124.47
	Total	238	

Table 3.37 above, shows that the mean ranks on the responses of the students on the different levels of ICT in use are different. 3-5 use level had a higher mean followed by 6-9 and then 0-2.

Table 3.38: Results of the Kruskal-Wallis Statistics Test

	Kruskal Wallis- value	р
Management	11.060	.004

The calculated value of the chi-square test for the Kruskal-Wallis statistics was 11.060 and significant value being 0.004, (i.e. 0.004<0.05).

This led to the rejection of the null hypothesis because the results from the analysis of the students' responses revealed that the levels of ICT in use had a significant effect on the management of the University.

An Analysis of variance (ANOVA) technique for academic staff was used to establish whether the results were matching those of students. The results and interpretations are presented in Table 3.39.

Table 3.39: Summary of the ANOVA Results of the Coefficients of Management and Levels of ICT Applications in use, According to the Academic Staff of Kyambogo University

			Std.	F	р
	Ν	Mean	deviation		
0-2	10	10.0000	3.68179	1.705	.196
3-5	21	7.8095	4.26168		
6-9	7	6.4286	4.15761		
Total	38	7.1316	4.17956		

This table indicates that the means of the responses of the academic staff on the management aspects differs with the levels of ICT in use. Contrary to the researcher's expectations however, the means for levels in use between 0-2 group are higher than any other category. We would expect those with levels in use of 6-9 to be the highest but the results revealed the opposite. This seems to imply that low levels of ICT in use are associated with effective management among the academic staff. However, the results show that there are no statistically significant differences in the means between the three categories of respondents with regard to the levels of ICT in use. This is because the sig. Value for the F-statistic was greater than the alpha value, i.e. .196 > .05.

The null hypothesis was therefore upheld. This implies that management of Kyambogo University does not differ in relation to the levels of ICT applications in use among the academic staff.

Table: 3.40 Summary of the Means and Standard Deviations of Levels of ICT Applications in use in the Management of Kyambogo University, According to the Top Management Officers

Levels of I	СТ			Std.	t	р
applications i	n use	Ν	Mean	Deviation		
Management	1-2	2	12.0000	.00000		
	3-4	4	10.0000	2.82843	.943	.399

This table indicates that the means of the responses of the top management officers on the levels of ICT applications in use were higher among the officers who selected use of ICT for communication and electronic library (12.0000) than for those who selected document production and entertainment (10.0000). This table shows that there are no significant relationship between the management aspects and the levels of ICT in use among the top management officers of the University. This is because the significance value is greater than the alpha value, i.e. .399 > .05. The null hypothesis was therefore upheld. This revelation suggests that the management of Kyambogo University

does not differ among the top management officers as well, in relation to the levels of ICT applications in use.

Test of the Fourth Hypothesis

The fourth null hypothesis stated: "Maintenance of ICT equipment and infrastructure of Kyambogo University does not relate to the management of the University."

The ANOVA analysis was run on the students' responses on whether they had ever been inconvenienced by the status of computer pieces in terms of performance (Q15) against the management aspects. The results of the analysis are presented in Table 3.41.

Table 3.41: Summary of the ANOVA Results Showing the Coefficients of Management Aspects Based on the Maintenance of ICT Equipment and Infrastructure, According to the Students of Kyambogo University

	Ν	Mean	Std. deviation	F	Р
Always	72	8.9444	5.24576		
Occasionally	64	6.6406	4.47344		
Sometimes	105	7.1143	4.59162	4.683	.010
Total	241	7.5353	4.83906		

According to this table, the mean of the students who indicated that the ICT equipment were always maintained was highest, followed by the mean for those who showed that the maintenance was sometimes done. The mean for the responses of those who said the equipment was occasionally carried out was the lowest.

These results were statistically significant implying that management of the University is significantly related to the maintenance of the ICT equipment and infrastructure of Kyambogo University (.010<. 05). The null hypothesis was therefore rejected

The academic staff's responses on the maintenance of ICT equipment and infrastructure were also correlated (Q11) with the composite index on the management aspects using ANOVA. Table 3.42 shows the means and standard deviations of the coefficients of management aspects based on the maintenance of the ICT equipment according to the academic staff.

Table 3.42: Summary of the ANOVA Results for the Coefficients of the Management Aspects Based on the Maintenance of ICT Equipment and Infrastructure, According to the Academic Staff of Kyambogo University

	N	Mean	Std. Deviation	F	р
Often	10	9.3300	4.0013		
Always	6	9.000	3.7416		
Occasionally	23	8.173	4.0074		
Never	3	2.666	2.5166	0.05	007
Total	42	8.166	4.0959	2.35	.087

These findings present that the mean responses of the academic staff who indicated that the ICT equipment and infrastructure were often maintained was the highest of the four categories, followed by those who indicated that the equipment and infrastructure were occasionally maintained and then those who revealed that they were never maintained. The calculated value of the F-statistic equal to 2.353 and the p-value = 0.087.These results were statistically insignificant (.087>.05), implying that according to the academic staff, maintenance of the ICT equipment and infrastructure of Kyambogo University were not related with the management of the University. The null hypothesis was therefore upheld.

Table: 3.43 Summary of the Means and Standard Deviations of Maintenance of ICT Equipment and Infrastructure and the Management of Kyambogo University, According to the Top Management Officers

Maintenance	of	ICT			t	р
equipment		and		Std.		
infrastructure	2	Ν	Mean	Deviation		
Management	1-5	1	12.0000	.00000	.560	.605
	6-11	5	10.4000	2.60768		

Table 3.43 above, shows that the mean ranks and the p-value of the ttest on the responses of the top management officers of Kyambogo University on the maintenance of the ICT equipment and infrastructure are different: 1-5 had a higher while 6-11 had a lower mean.

The differences in the means were statistically insignificant (.605>.05), implying that according to the top management officers, maintenance of ICT equipment and infrastructure were not related to the management of Kyambogo University.

Test of the fifth Hypothesis

The fifth null hypothesis stated: "There is no relationship between attitude of users of ICT towards ICT applications and the management of Kyambogo University."

Questions 15-18 and 18-20 from the academic staff and students' questionnaires were respectively used to test this hypothesis. The responses were coded as follows: For the academic Staff questionnaire, responses ranging from "Very good" to "Very bad" were given codes ranging from 4 to 1, respectively; for the students, a code of 1(one) was given to a respondent who ticked "Agree" and a zero for one who ticked "disagree".

The responses were then added to get an overall score for each of the respondent with a high score signifying a positive attitude and a low score indicating a negative attitude towards ICT applications. Subsequently, the scores were correlated with the composite index on the management aspects.

The Pearson product moment correlation test was then used to establish whether attitude of users of ICT towards ICT applications was significantly correlated to the management of Kyambogo University. The results of the analysis are presented in Table 3.44.

Table 3.44 Correlation Between Attitude of Users of ICT Towards ICT Applications and the Management of Kyambogo University, According to the Students

				Attitu	de of user	rs of	
				mutu		5 01	
				ICT	towards	ICT	Manage
				applic	cations		ment
Attitude of user	s of	ICT	Pearson Correlation	1			040(**)
towards ICT applications				T			.242(***)
			Sig. (2-tailed)				.000
			Ν	242			242
Management			Pearson Correlation	.242(**)			1
			Sig. (2-tailed)	.000			
			Ν	242			243

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

From Table 3.44, the computed value of the correlation was .242. This value was significant at alpha .01 (.000<. 01) implying that there is a positive relationship between users' attitude towards ICT applications and management of the University.

The proportion of the common variance between the attitude towards ICT applications and management of the University according to the students was 0.06 (6 percent) i.e. (.242).

The same analysis was run on the academic staff responses basing on each respondent's total score for attitude and the composite index on the management aspects. The results of the test are presented in Table 3.45.

Table 3.45: Correlation Between Attitude of Users of ICT Towards ICT Applications and the Management of Kyambogo University, According to the Academic Staff

			_
		Attitude of users	
		towards ICT application	Manageme
		and management	nt
Attitude of users towards ICT	Pearson Correlation		202(4)
application and management		1	.383(*)
	Sig. (2-tailed)		.013
	Ν	41	41
Management	Pearson Correlation	.383(*)	1
	Sig. (2-tailed)	.013	
	Ν	41	42

* Correlation is significant at the 0.05 level (2-tailed).

The computed value of the correlation (.383) was significant at alpha .05 (.013<. 05) implying that there is a positive relationship between attitude of users towards ICT applications and the management of the University.

The coefficient of determination for the two variables was 0.15 i.e. (.383)² implying that according to the academic staff responses, the proportion of common variance between attitude towards ICT and management of Kyambogo University was 15 percent.

Thus, from the two analyses and interpretations, both categories of respondents (academic staff and students) agree that there is a positive relationship between attitude of users of ICT and the management of the University. As the values of the correlation of .242 and .383 are close to zero respectively, it was established that the relationship was negligible. A weak but rather statistically significant relationship between attitude of users of ICT towards ICT applications and the management of Kyambogo University can therefore be seen.

Based on the above analysis and interpretation, the null hypothesis was rejected and research hypothesis upheld. Findings on the relationship between attitudes of users of ICT towards ICT applications based on the responses of the senior management staff are presented in the following table:

MANAGE Attitude of ICT users MENT towards ICT applications

Table 3.46: Correlation Between Attitude of Users of ICT Towards ICT Applications and the Management of Kyambogo University, According to the Senior Management Staff

MANAGEMENT	Pearson	1	659
	Correlation	Ť	
	Sig. (2-tailed)		.108
	Ν	7	7
Attitude of ICT	Pearson		
users towards ICT	Correlation	.659	1
applications			
	Sig. (2-tailed)	.108	
	Ν	7	7

The computed value of the correlation (.659) was not significant at alpha .05 (.659>.05) implying that there is no relationship between attitude of users of ICT towards ICT applications and the management of the University.

The coefficient of determination for the two variables was 0.43 i.e. (.659)[,] implying that according to the senior management staff responses, the proportion of common variance between attitude of users of ICT towards ICT applications and the management of Kyambogo University was 43 percent.

Thus, from the analysis and interpretation, responses of the senior management staff exhibit that there is no relationship between attitude of users of ICT and the management of the University.

Table 3.47: Correlation Between Attitude of Users of ICT Towards ICT Applications and the Management of Kyambogo University, According to Top the Management Officers

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		Attitude
		towards ICT
	Management	applications
Correlation Coefficient	1.000	.500
Sig. (2-tailed)		.313
Ν	6	6
Correlation Coefficient		

towards ICT		.500	1.000
applications			
	Sig. (2-tailed)	.313	
	Ν	6	7

Management

Attitude

Spearman's

rho

The computed value of the correlation (.500) was not significant at alpha .05 (.500>.05) implying that there is no relationship between attitude of users of ICT towards ICT applications and the management of the University.

The coefficient of determination for the two variables was 0.25 i.e. (.500)⁴ implying that according to the top management officers' responses, the proportion of common variance between attitude of users of ICT towards ICT applications and the management of Kyambogo University was 25 percent. In the circumstance, this analysis and interpretation of the findings, based on the responses of the top management officers, reveal that there is no relationship between attitude of users of ICT and the management of the University. Thus, based on the foregoing analysis and interpretation, the null hypothesis was upheld and research hypothesis rejected.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

INTRODUCTION

In this chapter, the findings presented, analysed and interpreted in Chapter Four are discussed hypothesis-by-hypothesis, with reference to the related and relevant literature cited in Chapter Two. The choice to discuss the hypotheses rather than research questions was preferred because the study had as many research questions as the hypotheses. The conclusions were then drawn from the discussion of the results of the study and pertinent recommendations based on the conclusions, have also been given.

DISCUSSION

Hypothesis One:

In the first hypothesis, the study postulated that availability of ICT equipment and infrastructure at Kyambogo University was related to the Management of the University and the findings presented in tables 3.31,3.32 and 3.33, confirm this assumption. This scenario therefore suggests that the use of the ICT in Kyambogo University is vital to its managerial operations.

These findings corroborate with Hattan, Harpel & Dawson (2004) who say that there is need for computerisation of the universities with linkage to the World Wide Web connectivities; encouraging use of the computers by students; and soliciting for government's intervention to procure the ICT equipment and ensure that the availability is sustained.

The findings also conform to Sanyal's (1994), Budd's (1997), MEXT's (2001) and IGNOU's (2002), revelations suggesting that American, European and Asian countries that include Japan and India use ICT in the management of the universities.

Citation by Ekong (1992) reporting that Africa is in dire need of ICT supports the argument that availability of ICT at Kyambogo University has a relationship with the management of the University. Furthermore, the World Bank (2004) concurs with Ekong in presenting the scenario that it is only 2.5 Ugandans out of every 1, 000, who have personal computers and also that there are at least 25, 000 internet users in the country to use 0.007 internet hosts available to every 10,000 people. This setting although not exhaustive enough to specifically show the linkages of ICT to the management of the universities, nonetheless underpins the fact that the functionality of ICT is vital in Uganda, Kyambogo University inclusive.

The dire need for ICT in the management of universities is also shown in the strategy by Kyambogo University to develop an ICT system (Kyambogo University, 2005/2006). The University suggests that operationalisation of the strategy would facilitate meeting the changing demands and challenges in both managerial and academic operations of the University.

Hypothesis Two:

The second hypothesis suggested that management of Kyambogo University was related to the use of ICT as exhibited by Tables 3.34,3.35 and 3.36, which contain findings on this hypothesis.

According to the students, use of ICT has an effect on the management of Kyambogo University. Contrary to the students' revelation, the academic staff indicated that use of ICT has no significant influence on the management of the University (Table 3.35). The top management officers together with the Senior management staff of the University in corroboration with the students revealed that use of ICT in Kyambogo University is related to the management of the University.

These findings are in line with IGNOU (2002) and MEXT (2001). While in IGNOU use of ICT can be seen in the provision of higher education through distance learning because it is learner-centered, user-friendly and ideal for heterogeneous characteristics of non-conventional students, MEXT reveals that in the Japanese setting, ICT is used to provide distance learning as well as supporting managerial operations of the university. Use of ICT has therefore been optimised. Furthermore, the findings also corroborate with Dias' (2002) suggestion that ICT use be linked to higher education to support management activities.

In concurrence with the MoES 2005) the findings corroborate with the Ministry's concern on the status of ICT in the institutions of higher learning, which concern led to the formulation of ICT policy for the education sector. The corroboration with the World Bank (2004) reveals the exhibition of the ICT concept as a vital intervention in the improvement of the quality of higher education because of the ICT's potentiality to mediate in administrative, teaching and learning activities of the institutions of higher learning.

The negative scenario, which seems to corroborate findings obtained through the academic staff and top management officers of Kyambogo University presents that ICT, is largely non-existent in most units of the University for administrative, teaching and learning (Makerere University, 2000/01 – 2004/05). This scenario limits use of ICT in the managerial and academic activities of the University.

Hypothesis Three:

The third hypothesis of the study was that management of Kyambogo University was related to the levels of ICT applications in use. Findings on this assumption contained in tables 3.37,3.38,3.39 and 3.40 indicate that: According to the students, levels of ICT applications in use in Kyambogo University had significant effect on the management of the University, contrary to the revelations among the academic staff (Table 3.39) and top management officers (Table 3.40) which indicate that the levels of ICT applications in use did not have effect on the management of the University. The findings revealed by the students is therefore in line with the U.S.A. situation, where levels of ICT applications in use in higher education are applied to support teaching, research, and managerial activities of the universities (Hattan, Harpel & Dawson, 2004).

The Ugandan scenario on the other hand, corroborates the findings obtained through the academic staff and top management officers (World Bank, 2004; Inyaga, 2002). This scenario exhibits that the ICT facilities and infrastructures are impressive and moreover the status of Kyambogo University in terms of levels of ICT applications in use and management of the University is not mentioned. The Indian scenario indicates that contrary to the Ugandan one, the following levels of ICT applications are in use by the academic staff of IGNOU: teleconferencing, teletrianing, and virtual convocations. This scenario further presents that the students use the ICT to download course materials and also communicate with both fellow students and the lecturers (IGNOU, 2002).

Uganda's situation is justified by Munhuweyi (2005) who provides that inadequate funding causes the existing status of the ICT system in Uganda. Ideally, the Ugandan higher education sub-sector would portray the use of new forms of ICT in research activities as in the case of South Africa (Republic of South Africa, 1992); to expand access and improve quality in education; enrolment of admissable students; and production of records on the graduates who have been properly trained (Aduala, 2001).

Furthermore, the ideal situation would also reflect an improvement on the utilisation of appropriate levels of ICT applications through the operationalisation of ICT policy and Nnagenda (2004) suggests utilisation of the following levels of ICT applications:

- Use of ICT-mediated teaching and learning among the academic staff and students, respectively.
- Establishment of virtual university system with appropriate aspects of ICT applications for staff and students.

Nnagenda further proposes that the academic staff and students would use Internet connectivities or local database in-country to benefit from elearning; source for information from the electronic libraries; and use an online education with component of communication, whose characteristics include e-mail system, bulletin boards and teleconferencing.

Makerere University (2004), together with the World Bank (2004) corroborates the findings obtained through the student-respondents, exhibiting that aspects of operationalisation of levels of ICT applications consist of students' registration system; examination administration; records management; financing accounting; estates and library management; and office system for document production, e-mail use and Internet access.

The World Bank reveals the appropriateness by the African Virtual University to use levels of ICT applications specifically to manage curriculum. The University uses teleconferencing and Internet connectivities to deliver the curriculum. To support the revelations by Makerere University and the World Bank, OECD (2004) and IIEP (2006) submit that levels of ICT applications in use at the university level are critical not only to curriculum management but also to serve as tools for building and using information systems for decisionmaking and policy analysis, as parameters of good management practices.

Furthermore, advantages of the utilisation of appropriate levels of ICT applications have been corroborated by Psaharopoulos & Woodhall (1985) and the Republic of Mozambique (2000) who argue that ICT-assisted teaching and learning and management operations improve external and internal efficiencies related to quality of education and effective management and administrative practices. The findings obtained through the students also corroborate what is in the Japanese system. In Japan ICT applications are used in curriculum management for both distance learning and conventional system. Contrary to these findings, the academic staff, together with top management officers, concurs with the MoES (1989) and Inyaga (2002), who reveal that curriculum management in Uganda's higher education institutions lack ICT component. Kyambogo University (2002) also concurs with these revelations by reporting that the ICT system established to support curriculum management is used to deliver curriculum at primary and secondary education levels.

The suggestion by Bakunda & Walusimbi-Mpanga (2005) that Uganda established ICT-mediated curriculum delivery centres to cope with significant growth in curriculum marketing is in line with the findings revealed by the student-respondents. The findings among the academic staff and top management officers however, contradict this scenario.

Hypothesis Four:

Tables 3.41,3.42 and 3.43 contain findings on the fourth hypothesis, which assumed that the maintenance of ICT equipment and infrastructure of Kyambogo University was related to the management of the University. The revelation by the students indicated in table 3.41 shows that maintenance of the ICT equipment and infrastructure was significantly related to the management of the University.

According to the academic staff and top management officers of the University however, the findings exhibit insignificant relationship between maintenance and management of Kyambogo University, a scenario that implies that maintenance of the equipment and infrastructure had no influence on the management of Kyambogo University.

The findings revealed by the students corroborate the World Bank (2002) whose report argues that maintenance of ICT hardware and software is vital for good performance of the equipment and therefore promotes effective and efficient management of the institutions of higher learning. The Bank further names cost implications in terms of maintenance costs for the equipment and infrastructure. The importance of good maintenance practices of the ICT equipment and infrastructure for effective and efficient management of the universities therefore, underpins the need to establish machinery for routine maintenance of the equipment.

The MoES (2005) in line with this perception names in its ICT policy the aspects of maintenance critical to sustainability of the functionality of the ICT:

- Establishment of the maintenance programmes in the institutions of higher learning.
- Creation of funds to sustain functionality of the system.

• Establishment of management system that will provide for the maintenance of the work stations, servers, data communication equipment, recruitment of the human resource to operate and maintain the system.

The cost implications for the maintenance would be addressed by introducing minimal user-charges. The importance of good maintenance practices for the ICT equipment in the universities has been identified by IGNOU (2002) and Bongyeirwe (2002). In order to adhere to the good maintenance practices, IGNOU runs a routine maintenance programme. This enables realisation of effective and efficient management operations. To corroborate these findings, Bongyeirwe reveals that African universities do not ensure maintenance of their ICT equipment and infrastructure. The situation obtaining at Kyambogo University seems to corroborate these findings: the ICT is available at Kyambogo University but the availability of the maintenance programmes are not explicitly revealed.

Hypothesis Five:

The fifth hypothesis was that there was relationship between attitude of users of ICT towards ICT applications and management of Kyambogo University. The findings according to the students (Table 3.44) and academic staff (Table 3.45) revealed that attitude of users of ICT towards ICT applications have effect on the management of Kyambogo University. These findings corroborate the World Bank (2004) which reports that positive attitude towards ICT applications has globally revolutionised higher education. The Bank further presents a scenario, where a researcher in a given institute of higher learning can access publications from several universities all over the world using ICT mediation; a lecturer can teach thousands of students from across universities, using ICT connectivities; and virtual universities are now a reality.

The findings contained in the tables 3.44, 3.45, 3.46 and 3.47 however, show that according to the top management officers (Table 3.47) and senior management staff (Table 3.46) of the University, the attitude of users has no statistical significance on the management of the University. This therefore implies that the attitude of users of ICT towards ICT applications in Kyambogo University does not affect the management of the University. Hall (1996), Shukla (1991), Carter (1999) & Kigongo-Bukenya (1996) support these findings.

Hall acknowledges that the application of ICT in the management practices is good but fears that increased use of the technology may present less equity of access to higher education because of costs involved in establishing, operationalising maintaining and sustaining the technology, while Shukla's fears lie in the perception that the ICT applications in higher education institutions may threaten employment and development of global culture. In support of the same argument, Carter asserts that students develop stress and anxiety when they use the ICT technology while Kigongo-Bukenya argues that ICT applications in the management setting may create staffing problems that include redundancy of staff that may be demanded for by the restructuring programmes that entail reduction of staff. The variation in the findings between those presented by the academic staff and students on one hand, and those revealed by the top management officers and senior management staff on the other, presents the argument that because of the small numbers of the top management officers and senior management staff, their findings would not be more precise. To be more precise, the numbers of the respondents have to be bigger.

CONCLUSIONS

Basing on the findings of the study as revealed by the results of the tests of the hypotheses, the researcher presents the following conclusions:

- The availability of equipment and infrastructure as a functionality of ICT among the students and academic staff, affects management of Kyambogo University.
- The use of ICT differs in relation to the management of Kyambogo University according to the students of the University but does not differ among the academic staff.
- The levels of ICT applications in use in Kyambogo University significantly affect the management of the University, according to the students but do not differ among the academic staff.
- The maintenance of ICT equipment and infrastructure of Kyambogo University is significantly related to the management of the University.
- There is relationship between attitude of users of ICT towards ICT applications and the management of Kyambogo University among the academic staff and students. However, among the top management officers and senior management staff of the University, the attitude of

users of ICT towards ICT applications differs with the management of the University.

On the basis of the study findings, the researcher is of the view that availability of ICT equipment and infrastructure has significant relationship with the management of Kyambogo University. The effectiveness and efficiency of the management of the University depends on the functionality of the ICT.

Furthermore, the linkage between the ICT use and management of Kyambogo University is critical for good managerial practices for both internal beneficiaries, who include students and academic staff; and external beneficiaries, who consist of stakeholders, individuals in the community, organisations that do business with the University and the Government as a policy maker and supervisor of policy implementation.

As for the use of ICT and the management, the study has confirmed that the use of ICT in the University reflects functionality of the ICT equipment and infrastructure. Nevertheless, the optimum usage could be affected by the: age of the ICT user; type of work of ICT user; ICT budget; ICT literacy level and competency of the users; and quality of the ICT equipment and infrastructure. This study seems to have thrown light on the effect of the levels of ICT applications on the management of Kyambogo Univesity.The optimum utilisation of the ICT, which ideally should be reflected in the existence of the relationship between the ICT functionality and management of the University, can only be reflected by the existence of the levels of ICT applications in use. Machinery that ensures use of ICT in the different levels of applications is therefore desirable in the University.

With regard to the maintenance of the ICT equipment and infrastructure, the research seems to indicate that it has significant influence on the management operations. Furthermore, the study seems to also argue that for the equipment and infrastructure to be effectively and efficiently utilised, they ought to be in good operational and functional condition. Maintenance is therefore an indispensable process in the functionality of the ICT in Kyambogo University.

Lastly, the study suggests that the attitude of users of ICT towards an innovative arrangement of use of ICT applications in a management setting is critical for the implementation of the innovation, implying that attitude of users of ICT is a driving force to the users of the technology to use for the benefit of the University. Against the background of the fieldwork, the researcher perceives that optimum functionality of the ICT in Kyambogo University depends on the attitude of ICT users towards the technology's applications. Nonetheless, Stress and anxiety among the users of ICT have been identified as factors that may derail adoption of and, or adaptation to the technology.

RECOMMENDATIONS

The following recommendations are derived from the study, based on the conclusions:

- Kyambogo University should expeditiously review its ICT policy to support holistically both managerial and academic activities of the University, from the perspective of availability of equipment and infrastructure.
- The University should also re-design and develop appropriate levels of ICT applications in use to support teaching, research, and learning activities in the academic units; and managerial and administrative operations in the management and finance units.
- A programme of maintenance and service of the ICT equipment and infrastructure should be designed with frequency and sustainability in consideration.
- Tendencies of stress and anxiety on the ICT applications among the users, could be controlled by Kyambogo University through in-house sensitisation, counseling and re-tooling sessions to enable staff and students cope with the demands of the technology.

Area for Further Studies:

This study sought to discover how use of ICT affects the management of Kyambogo University. The findings varied between respondents in their respective groups. In order to fully understand the effect of use of ICT on the management of the universities, the following further studies should be carried out:

A replication of the study in another university in Uganda with a variation in the: identification of the independent variables; sampling methods and analysis of the findings; and selection of the management theory up on which the study would be based. The independent variables that would be ideal in the replication would consist of the: age of the ICT user; type of work of the ICT user; ICT budget; ICT literacy level or skills and competency of the ICT user; and quality of the ICT equipment and infrastructure.
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APPENDICES

APPENDIX 1

QUESTIONNAIRE A

QUESTIONNAIRE FOR SENIOR MANAGEMENT STAFF OF KYAMBOGO UNIVERSITY

Presently, there is insufficient data about the application of Information and Communications Technology (ICT) in Kyambogo University.

Application of ICT in the management of Kyambogo University is required if the university is to meet and conform to the international practices.

An investigation to identify and establish the status of the ICT application in the management of the university is being conducted. It is in view of this that you are requested to participate in this study by completing this questionnaire. The completed questionnaire will be picked from you by either the contact person who delivered to you, or the researcher himself.

All the information given will strictly be used for the study, treated with confidentiality and your name is not required unless you personally choose to include it.

Thanking you in anticipation,

Sincerely yours,

A. BILALI

RESEARCHER

1. Sex:	Male		Female	
2. Marital Status:	Single Divorced		Married Widowed	
3. Designation				
4. Department				
5. Qualifications: First Degree (B.A., B.Sc., L	LB, etc)			
Second Degree (M.A, M.Sc.	, LLM etc)		
PhD.				

SECTION A: BIODATA

SECTION B: ICT-ASPECTS

Relationship between ICT and Management of Universities

Availability of ICT equipment and, or infrastructure

- 6. Does your Department have an ICT equipment and, or infrastructure? Yes No
- 7. If "Yes", in (6) above, is the equipment and, or infrastructure effective and efficient?
 Yes No
 No
- 8. If "No", in (6) above, what is the problem? Equipment and, or infrastructure do/does not exist

Others (Please specify)

.....

Use of ICT by Senior Staff

9. Are activities in your schedule of duties ICT – aided? Yes No
10. If "Yes", in (9) above, briefly, provide status
......

11.	If "No", what is the problem?

Levels of ICT Applications in use

12. Do you also use ICT for: Secretarial functions?	
Communications, e.g. e-mail, teleconferencing, etc?	
Resource centre, e.g. digital library for reference works?	
Entertainment e.g. playing games, visiting, and leisure sites on the Intern	iet?
Others (Please specify)	

Maintenance of ICT Equipment and, or Infrastructure

13.Are	the	ICT	equipment	and,	or	infrastructure	in	your	Department
mair	ntain	ed?							
Yes				Ν	0				

14. If "Yes", in (14) above, they are maintained: Often?

Always?		
---------	--	--

Occasionally?	
---------------	--

Attitude of Users of ICT Towards ICT Applications

If requested to assess and evaluate your attitude towards ICT

applications in your Department, would say that it is:

Under management functions:

Very good	
Good	
Bad	
Very bad	

16. Under Communications:

Very goo	od 🔤
Good	

Very bad

17. Under secretarial functions:

Very good	
Good	
Bad	
Very bad	

Very good	
Good	
Bad	
Very bad	

Explain your answer:

.....

SECTION C: MANAGEMENT – ASPECTS

Planning

19. Do you use ICT in planning process?

Yes 🗔	
-------	--

No 🗔

20. If "Yes", in (19) above what aspects of planning do you carry out using ICT? 1 ____

Policy formulation	
Policy implementation	n 🗔
Strategic planning	
Decision-making	

Do you as a department share experiences in planning with 21. others? Yes 🗔 No 🗔

Organising

- 22. Do you use ICT in organising as an aspect of management? Yes No 🗔
- If "Yes", in (22) above, what aspects of organising do you use ICT 23. for? Delegation of authority

Delegation of authority	
Line relationship	

Staff relationship

24. Do you as a department share experiences in organising with others? Yes 🗔

No	
110	

Staffing

- 25. Do you use ICT in staffing: Yes No
- 26. If "Yes", in (25) above what aspects of staffing do you carry out with ICT aid?

manpower planning	
Staffing recruitment/hire	
Staff development	
Performance appraisal	

27. Do you as department share staffing with others? Yes No

Directing

- 28. Do you use ICT in directing as an element of management? Yes No
- 29. If "Yes", in (27) above, what aspects of directing do you use ICT for?

motivation —	tivation 📖
--------------	------------

Communications \square

30. Do you as a department share directing with others? Yes □ No □

Controlling

- 31. Do you use ICT in controlling as an element for management? Yes No
- 32. If "Yes", in (31) above, mention the aspects of controlling for which use ICT: Control system

33. Do you as a department share controlling with others? Yes No

Reporting

34. Do you use ICT in reporting as a management process? Yes □ No □

35. If "Yes", in (34) above, under what aspects of reporting do you use ICT?

Quarterly reportin

Bi- a	Innual	reporti
-------	--------	---------

Annual	reporting	
--------	-----------	--

36. Do you as a department share reporting with others? Yes No

Budgeting

 38. If "Yes", in (37) above, under what aspects of budgeting, do you use ICT for?

Budgetary	formu	lation	
-----------	-------	--------	--

Budgetary development	
Dudgetary development	

Budgetary control	
Duagetary control	

39. Do you as departments share your experiences in budgeting with others?

	Yes 🖂]	No	
--	-------	---	----	--

APPENDIX 2

QUESTIONNAIRE B

QUESTIONNAIRE FOR KYAMBOGO UNIVERISTY ACADEMIC STAFF

Presently, there is insufficient data about the application of Information and Communications Technology (ICT) in Kyambogo University.

Application of ICT in the management of Kyambogo University is required if the university is to meet and conform to the international practices.

An investigation to identify and establish the status of the ICT application in the management of the university is being conducted. It is in view of this that you are requested to participate in this study by completing this questionnaire. The completed questionnaire will be picked from you by either the contact person who delivered to you, or the researcher himself.

All the information given will strictly be used for the study, treated with confidentiality and your name is not required unless you personally choose to include it.

Thanking you in anticipation,

Sincerely yours,

A. BILALI

RESEARCHER

SECTION A: BIO DATA

1. Sex:	Male		Female	
2. Marital Status:	Single Divorced		Married Widowe	
 Designation Faculty Qualifications: 				•••
First Degree (B.A., B.Sc.,	LLB, etc)			
Second Degree (M.A, M.S	c., LLM etc)		
PhD.				

SECTION B: ICT – ASPECTS

Relationship between ICT and Management of

Universities

Availability of ICT Equipment and Infrastructure

6. Does your Faculty has an ICT equipment and, or infrastructure? Yes No

7. If "Yes", in (6) above, is the equipment and, or infrastructure: Functional?

Effective?

Non-functional?

Others, (Please specify)

8. If "No", in (6) above, what is the problem?

.....

Equipment and, or infrastructure do/does not exist

Others, (Please specify).....

Use of ICT by Academic staff

9. Does schedule of your duties call for use of ICT? Yes N

Levels of Application in use

10. Do you use ICT equipment for: Curriculum Design?	
Curriculum Development?	
Curriculum Delivery?	
Electronic References?	
Communications, e.g. e-mail, teleconferencing etc?	
Production of documents/secretarial functions?	
Entertainment, e.g. playing games; visiting leisure sites on the Inter-	net?
Others, (Please specify)	

Maintenance of ICT Equipment and, or infrastructure

11. Are the ICT equipment and, or infrastructure in your Faculty maintained: Often?

Always?

Occasionally?

Never?

Attitude of users of ICT Towards ICT Applications

12. If requested to assess and evaluate your attitude towards ICT applications in your Faculty, would you say that it is: Under curriculum design:

Very good	
Good	
Bad	

Very bad

13. Under curriculum development:

Very good	

- Good
- Bad
- Very bad

Very good	
Good	
Bad	
Very bad	

15. Under electronic references:

Very good	
Good	
Bad	
Very bad	
Under Commu Very good	nications:
Good	
Bad	
Very bad	

16.

17. Under document production/secretarial functions: Under curriculum design

Very good	

- Good
- Bad

Very bad

18. Under entertainment: Under curriculum design

Very good	
Good	
Bad	
Very bad	

SECTION C: MANAGEMENT-ASPECTS

Planning

- 18. Do you use ICT in the planning process of the Faculty? Yes No
- 19. If "Yes", in (19) above, under what aspects of planning do you employ ICT?Policy formulation

Policy implementation	
-----------------------	--

Strategic planning

Decision-making	
-----------------	--

20. Do you as faculties share your experiences in planning with others?

Yes			No	
-----	--	--	----	--

Organising

21. Do you use ICT in the organisation of your Faculty? Yes No

22. If "Yes", in (21) above, under what aspects of organising do you use

Designing organization structure \Box

Delegation of authority

Line relationship

Staff relationship

23. Do you as a faculty share experiences in organising with others? Yes No

Staffing

24.	Do you use ICT in staffing of the Faculty? Yes No
25.	If "Yes", in (24) above, under what aspects of staffing do use ICT? Manpower planning
	Staff recruitment/hire
	Staff development
	Performance appraisal
26.	Do you <u>as faculties share experiences in staffing with others?</u>
	Yes No
Explain	
Directing	
27.	Do you use ICT in directing as an element management? Yes No
28.	If "Yes", in (26) above, what aspects of directing do you ICT for? Leadership
	Motivation
	Communications

29. Do you as a faculty share experiences in directing with others? Yes No

Controlling

- 30. Do you use ICT in controlling as an element of management? Yes _____ No ____
- 31. If "Yes", in (29) above, mention the aspects of controlling for which you use ICT: Control system

Control process	
-----------------	--

32. Do as a faculty share experiences in controlling with others? Yes No

Reporting

- 33. Do you use ICT in reporting as a management process? Yes No
- 34. If "Yes", in (32) above, what aspects of reporting do you use ICT for?

Quarterly reporting

Bi- annual reporting \square

Annual reporting

37. Do you as a faculty share experiences in reporting with others?

Yes No 🖂

Budgeting

38	Do you use ICT in budgeting?	
	Yes 🗔	No 🗔

39. If "Yes", in (37) above, what aspects of budgeting do you use ICT for? Budgetary formulation

Budgetary development

Budgetary control

40. Do you as a Faculty share your experiences in budgeting with others? Yes No

APPENDIX 3

QUESTIONNAIRE C

QUESTIONNAIRE FOR KYAMBOGO UNIVERSITY STUDENTS

Presently, there is insufficient data about the application of Information and Communications Technology (ICT) in Kyambogo University.

Application of ICT in the management of Kyambogo University is required if the university is to meet and conform to the international practices.

An investigation to identify and establish the status of the ICT application in the management of the university is being conducted. It is in view of this that you are requested to participate in this study by completing this questionnaire. The completed questionnaire will be picked from you by either the contact person who delivered to you, or the researcher himself.

All the information given will strictly be used for the study, treated with confidentiality and your name is not required unless you personally choose to include it.

Thanking you in anticipation,

Sincerely yours,

A. BILALI <u>RESEARCHER</u> Please answer the following questions by ticking what is applicable to you, and filling the gaps where you are required to do so.

SECTION	A: I	BIO I	DATA
---------	------	-------	------

1.	Sex:	Male		Female
2.	Marital Status:	Single Divorceo	d	Married 🔲 Widower 🗔
3.	Age			
4.	Qualification at tl "A" Level and Mat	he time o ture Age l	f joining: Entry Certificat	e
	Diploma			
	First Degree			
	Second Degree			

5. Course.6. Year of joining the University.

SECTION B: ICT-ASPECTS

Availability of ICT Equipment and Infrastructure

- 7. There are adequate numbers of computers in the Faculty for my course and in the Library for my digital references.Agree Disagree Disagree
- 8. I am satisfied with the performance of the computer system: Agree Disagree
- 9. There is at least 1 computer to five students in the university. Agree Disagree

Use of ICT by students

- 10. I use computer system for my studies Yes No
- 11. I have ever been issued with ICT rules and regulations of this university Yes No

12. I use computer system to source for information for my assignments and course works. Agree Disagree

Levels of ICT Applications in use

- 13. We are generally satisfied with the following aspects of ICT system: Agree Disagree
 - (a) Efficient use of the ICT Infrastructure
 - (b) Effective and use of the ICT infrastructure
 - (c) Levels of ICT use in our study, teaching &research programmes:
 - (d) Curriculum management
 - (e) Internet
 - (f) Quality of maintenance of ICT Equipment and Infrastructure
 - (g) E-mail
 - (h) Use of ICT systems for study, in the teaching and research
 - (i) Visiting leisure sites

Maintenance of ICT Equipment and Infrastructure

- I have ever been inconvenienced by the use of computers because of poor management
 Agree Disagree Disagree
- I have ever been inconvenienced by the status of computer pieces in terms of performance:
 Always
 Occasionally

Sometime 🛾	
------------	--
16. I am aware of break downs of computer pieces in Faculty: Agree Disagree Disagree

17. I am aware of break downs of computer pieces use in the University Library Agree Disagree

Attitude of Users of ICT Towards ICT Applications

- 18. I am not conversant with the use of computers in management functions under Planning, Organising, Staffing, Directing, Controlling, Reporting and Budgeting (POSDCORB): Agree Disagt
- 19. I have ever been referred to electronic libraries to access information for my assignments. Agree Disagree
- 20. I sometimes search for electronic journals or magazines for my assignments or self-study: Agree Disagree Disagree

SECTION C: MANAGEMENT-ASPECTS

Planning

- 21. I am aware that planning in Kyambogo University is ICT-aided: Agree Disagree
- 22. If "Agree", in (21) above, the following aspects of planning are ICTaided: Policy formulation

Policy	impl	lementa	ti
--------	------	---------	----

Strategic	nlanning	
Shalegic	planning	

23. There is in Kyambogo University sharing of experiences as an aspect of management: Agree Disagree

Briefly, explain:

Organising

24. I am aware that organising as an aspect of management in Kyambogo University is ICT – aided: Agree Disagree D

25.	If "Agree", in (24) above, the following ICT-aided: Designing organisation structure	aspects of organising are
	Delegation of authority	
	Line relationship	
	Staff relationship	

26. There is in Kyambogo University sharing of experiences in organising as an aspect of management in Kyambogo University: Agree Disagree

Staffing

Briefly explain:

- 27. I am aware that staffing as an aspect of management in Kyambogo University is ICT –aided: Agree Disagree D
- 28. If "Agree", in (27) above, the following aspects of staffing are ICTaided: Manpower plannin

Staff recruitment

Staff development _____re

Performance appraisal

29. There is in Kyambogo University sharing of experiences in staffing as an aspect of management: Agree Disagree Disagree

Directing

- 30. I am aware that directing as an aspect of management in Kyambogo University is ICT-aided: Agree Disagree
 - 31. If "Agree", in (30) above, the following aspects of directing are ICTaided: Leadership

Motivation

Communica___ns

a. There is in Kyambogo University sharing of experiences in directing as aspect of management?
Agree Dis_____

Briefly explain:

Controlling

- 32. I am aware that controlling as an aspect of management in Kyambogo University is ICT-aided: Agree Disagree
 - 33. If "Agree", in (32) above, the following aspects of controlling are ICT-aided: Control syst

Control prod

34. There is in Kyambogo University sharing of experiences in controlling as an aspect of management:
 Agree Disagree

Reporting

- I am aware that reporting as an aspect of management in Kyambogo University is ICT-aided:
 Agree Disagree Disagree
 - 36. If "Agree", in (36) above, the following aspects of reporting are ICTaided: Quarterly reporting

Bi- annual reporting

Annual reporting

37.	There	is	in	Kyambogo	University	sharing	of	experiences	in
	reporti	ng	as a	n aspect of 1	nanagement				
	Agree				Disagre	e 🗌			

Briefly explain:

Budgeting

38.I am aware that budgeting as an aspect of management in Kyambogo University is ICT-aided: Agree Disagree

39.f "Agree", in (39) above, the following aspects of budgeting are ICT- aided: Budgetary formulati

Budgetary developm

Budgetary control

40.There is in Kyambogo University sharing of experiences in budgeting as an aspect of management: Agree Disagree

Briefly explain:

 	 	• • • • • • • • • • • • • • • • • • • •

APPENDIX 4

INTERVIEW SCHEDULE FOR TOP MANAGEMENT OFFICERS OF KYAMBOGO UNIVERSITY

TOPIC: Information and Communications Technology and Management of Kyambogo University

Presently, there is insufficient data about the application of Information and Communications Technology (ICT) in Kyambogo University.

Application of ICT in the management of Kyambogo University is required if the university is to meet and conform to the international practices.

An investigation to identify and establish the status of the ICT application in the management of the university is being conducted. It is in view of this that you are requested to participate in this study by completing this questionnaire. The completed questionnaire will be picked from you by either the contact person who delivered to you, or the researcher himself.

All the information given will strictly be used for the study, treated with confidentiality and your name is not required unless you personally choose to include it.

Thanking you in anticipation,

Sincerely yours,

A. BILALI <u>RESEARCHER</u>

SECTION A: BIO DATA

Please answer the following questions as asked:

$\frac{1}{2}$	Sex:	Male	Female
2. 3.	Marital Status:	Single Divorced	Married Widowed
4.	Designation		
5. 6.	Department Qualifications: First Degree (B.A.	, B.Sc., LLB, etc	
	Second Degree (M	.A, M.Sc., LLM €	
	PhD.		

SECTION B: ICT-ASPECTS

Relationship between ICT and Management of Kyambogo University

Availability of ICT Infrastructure

- 7. Does your Department have ICT equipment and, or infrastructure? Yes No
- 8. If "Yes", in (6) above, is it: Functional?

Efficient?	

Effective?	

Not functional?

9. If "No", in (6) above, why don't you have ICT equipment and, or infrastructure?

.....

.....

Use of ICT by Top Management staff

- Do you use ICT for your day-to-day work? 10. No 🗌 Yes
- If "Yes", what is your concept of ICT system in university 11. operations and administration?

.....

12. Do you see the existence of the concept referred to in (9) above, in Kyambogo University system?

.....

Levels of ICT Applications in use

13. Do you use ICT for:

Communications, e.g. e-mail, Teleconferencing?	
Electronic library for reference?	
Document production/secretarial functions?	
Entertainment, e.g. visiting leisure sites on the In	nternet?

Maintenance of ICT Equipment and Infrastructure

14. How often are the ICT Equipment and Infrastructure maintained in your office? Very often

Often	
Sometimes	
Always	

Maintenance of ICT Equipment and, or Infrastructure

15. How often are the ICT equipment and, or infrastructure maintained in Academic departments? Very often

Often	
-------	--

Sometimes	
-----------	--

Always	
--------	--

16. How often are the ICT equipment and, or infrastructure maintained in the library? Very often

Often	
-------	--

Sometimes [
-------------	--

Always

Attitude of Users of ICT Toward ICT Applications

17. What is your self-assessment and self-evaluation of your attitude towards ICT applications in the following management functions: Very good Good Bad Very bad

	very good	1 0000	Dau	VCI y Da
Planning?				
Organising				
Staffing?				
Directing				
Controlling?				
Reporting?				
Budgeting?				

Explain your answer:

•••••			
•••••	•••••	••••••	••••••
•••••			
•••••	•••••	••••••	••••••
		•••••	

SECTION C: MANAGEMENT -ASPECTS

Planning

- 18. Do you use ICT in planning? Yes No
- 19. If "Yes", in (18) above, mention aspects of planning for which you use ICT:

Policy formulation	
Policy implementation	
Strategic planning	

- Decision-making
- 20. Is there established machinery to facilitate sharing of experiences in planning aspects in the university?

Yes 🗌 No 🗔

Explain

.....

Organising

21. Do you use ICT in organising as an aspect of management? Yes □ No □ 22. If "Yes", in (21) above, what aspects of organising do you use ICT for?

D · ·	• ,•		
100100100	orgonigotion	011101	–
DUSISIUMS	Ulgamsation	SUUC	

Delegation au	thority				
Line relations	hip				
Staff relations	hip				
23. Is there in organising a Yes □	established m as a manageme	nachinery ent aspe	y to facilitat ct? No 🗔	e sharing of	f experiences
Explain					
		•••••			
		•••••			
Staffing					
24. Do you Yes 🗔	use ICT in staf	fing as a	n element of No 🔲	f manageme	nt?

25. If "Yes", in (22) above, have aspects of staffing for which you use ICT: Manpower planning

Staff recruitment/h

Performance apprai

26. Is there established machinery to facilitate sharing of experiences in staffing as a management aspect? Yes □ No □

Explain.....

Directing

- 27. Do you use ICT in directing as an element of management? Yes □ No □
- 28. If "Yes", in (25) above, what aspects of directing do you use ICT for?Leadership

Motivation	
Mouvation	

Communications	
----------------	--

29. Is there established machinery to facilitate sharing of experiences in directing as a management aspect? Yes No

Explain		
•••••	••••••	 •••••

Controlling

- 30. Do you use ICT in controlling as a management aspect? Yes □ No □
- 31. If "Yes", in (30) above, what aspects of controlling do you use ICT for? Control system

Control	process	
	L	

32. Is there established machinery to facilitate sharing of experiences in controlling as a management aspect?

Yes No	
--------	--

Explain

Reporting

33. Do you use ICT in reporting as an element of management? Yes □ No □

34. for? Quart	If "Yes", erly repo	in (33) rting 🗔	above,	what	aspects	of	reporting	do	you	use	ICT
Bi- ar	inual rep	orting]								
Annu	al reporti	ng 🕅									

Is there established machinery to facilitate sharing of experiences in reporting as a management aspect?

Yes 🗔	No 🗔
Explain	
•••••••••••••••••••••••••••••••••••••••	• • • • • • • • • • • • • • • • • • • •

Budgeting

- 35. Do you use ICT in budgeting as an element of management? Yes □ □
- 36. If "Yes", in (36) above, what aspects of budgeting do you use ICT for? Budgetary formulati

Budgetary developm

Budgetary cont	trol 🗌
----------------	--------

37. Is there established machinery to facilitate sharing of experiences in budgeting as a management aspect?

Yes 🗔	No	

Explain

•••••				
			••••••	
•••••••••••			••••••••••••••••••	
•••••	• • • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • •		

THANK YOU VERY MUCH FOR YOUR TIME