

**INFLUENCE OF INFORMATION COMMUNICATION AND  
TECHNOLOGY ON MANAGEMENT OF HIGHER EDUCATION IN  
KENYA: A CASE OF THE UNIVERSITY OF NAIROBI**

**BY  
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**DECLARATION**

This project report is my original work and has not been presented in any other University for the award of any degree.

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## **DEDICATION**

This research is dedicated to my family. My wife Caroline Kwamboka, my daughter Noelle Nafula and son David Ekhabi for allowing me time off to carry out this research and complete my Master's Degree. They have been a great source of motivation and inspiration throughout the research work.

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## TABLE OF CONTENTS

DECLARATION .....	i
DEDICATION .....	ii
ACKNOWLEDGEMENT .....	iii
LIST OF TABLES .....	vii
LIST OF FIGURES .....	viii
ABBREVIATIONS AND ACRONYMS .....	ix
ABSTRACT.....	x
<b>CHAPTER ONE:INTRODUCTION .....</b>	<b>1</b>
1.1 Background of the Study .....	1
1.2 Statement of the Problem.....	4
1.3 Purpose of the Study .....	5
1.4 Objectives of the Study.....	5
1.5 Research Questions .....	6
1.6 Significance of the Study .....	6
1.7 Limitations of the Study.....	6
1.8 Delimitations of the Study .....	7
1.9 Assumptions of the Study .....	7
1.10 Definition of Significant Terms used in the Study .....	7
1.11 Organization of the Study .....	8
<b>CHAPTER TWO:LITERATURE REVIEW.....</b>	<b>9</b>
2.1 Introduction.....	9
2.2 Online Learning Options and Management of Higher Education .....	9
2.3 ICT Integration in Teaching and Learning on Management of Higher Education.....	11
2.4 ICT Integration in Research on the Management of Higher Education .....	13
2.5 ICT Integration in Information Management in Higher Education .....	14
2.6 Theoretical Framework.....	15
2.6.1 Diffusion of Innovation Theory .....	15
2.6.2 Contemporary Learning Theory .....	15
2.6.3 Technology Acceptance Model by Ventakesh, Morris, Davis and Davis 2003 .....	16
2.7 Conceptual Framework.....	16
2.8: Knowledge Gaps.....	18
2.9 Summary of Literature Review.....	19
<b>CHAPTER THREE:RESEARCH METHODOLOGY .....</b>	<b>20</b>
3.1 Introduction.....	20
3.2 Research Design.....	20
3.3 Target Population.....	20
3.4 Sampling Size and Sampling Procedure .....	20
3.4.1 Sample Size.....	21
3.4.2 Sampling Procedure .....	21

3.5 Research Instruments .....	21
3.5.1 Pilot-testing of the Research Instrument.....	22
3.5.2 Validity of the Research Instrument .....	22
3.5.3 Reliability of the Research Instrument .....	23
3.6 Data Collection Procedures.....	24
3.7 Methods of Data Analysis.....	25
3.8 Operational Definition of Variables.....	25
<b>CHAPTER FOUR:DATA ANALYSIS, PRESENTATION AND INTERPRETATION ....</b>	<b>27</b>
4.1 Introduction.....	27
4.2 Questionnaire Response Rate .....	27
4.3 Demographic Information of the Staff.....	27
4.3.1: Gender Characteristics of Respondents.....	27
4.3.2: Level of Education.....	28
4.3.3: Number of Years Worked at the University. ....	28
4.3.4: Number of Years worked in the ICT Field.....	29
4.4: Demographic Information of the Students.....	29
4.4.1: Distribution of respondents by Gender .....	29
4.4.2: Year of Study .....	30
4.4.3: Student Respondents.....	30
4.5 Students’ use of ICT Facilities.....	31
4.5.1: Rate of Using ICT Facilities .....	31
4.5.2: Reason for Using ICT Facilities .....	31
4.5.3 Influence of Online Learning Options on the Management of Higher Education.....	31
4.5.4: Online Learning Options and Management of Higher Education at UON.....	33
4.5.5: Students Views .....	34
4.6: ICT Integration in Learning Process on the Management of higher education.....	36
4.6.1 Head of Department Views.....	36
4.6.2 Students Views.....	38
4.7 Influence of ICT Integration in Research on the Management of Higher Education .....	39
4.7.1 Head of Department Views.....	39
4.7.2 Students Views.....	41
4.8: Information management on the Management of higher education .....	43
4.8.1 Head of Departments Views .....	43
4.8.2 Students Views.....	45

<b>CHAPTER FIVE:SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSION AND RECOMMENDATIONS.....</b>	<b>47</b>
5.1 Introduction.....	47
5.2 Summary of Findings.....	47
5.2.1 Influence of Online Learning Options on the Management of Higher Education.....	47
5.2.2 ICT Integration in Teaching and Learning Process on the Management of higher education.....	48
5.2.3 Influence of ICT Integration in Research on the Management of higher education. ..	48
5.2.4 Information management on the Management of higher education .....	49
5.3 Discussions of key findings .....	49
5.3.1 Influence of Online Learning Options on the Management of Higher Education.....	49
5.3.2 ICT Integration in Teaching and Learning Process on the Management of higher education.....	50
5.3.3 Influence of ICT Integration in Research on the Management of higher education. ..	50
5.3.4 Information management on the Management of higher education .....	51
5.4 Conclusions.....	51
5.5 Recommendations.....	52
5.6 Recommendations for Further Research.....	53
<b>REFERENCES .....</b>	<b>54</b>
Appendix I: Letter of transmittal of data collection instruments.....	57
Appendix II: Heads of departments questionnaire.....	58
Appendix III: Student questionnaire.....	63
Appendix IV: University of Nairobi academic departments .....	68

## LIST OF TABLES

Table 2.1: Gaps identified in literature review .....	18
Table 3.1: Operationalization of Variables .....	26
Table 4.1: Response Rate.....	27
Table 4.2: Distribution of respondents by Gender .....	27
Table 4.3: Level of Education.....	28
Table 4.4: Number of years Worked at the University .....	28
Table 4.5 : Number of Years worked in the ICT Field.....	29
Table 4.6: Gender of the respondents .....	29
Table 4.7: Year of the study.....	30
Table 4.8: Rate of Using ICT Facilities .....	31
Table 4.9: Reason for using ICT Facilities .....	31
Table 4.10: Online Learning and Management of Higher Education.....	32
Table 4.11: Online Learning Options and Management of Higher Education .....	33
Table 4.12: Ease of Managing Academic Reports.....	33
Table 4.13: Online Learning Options and Management of Higher Education .....	34
Table 4.14: Online Learning at UoN .....	35
Table 4.15: Online Learning Options and Management of Education .....	36
Table 4.16: Integration of ICT in Teaching and Learning.....	37
Table 4.17: ICT Integration in Teaching and Learning Process .....	38
Table 4.18: Teaching and Learning Process and Management of Higher Education.....	39
Table 4.19: ICT Integration in Research and Management of Higher Education .....	39
Table 4.20: ICT Integration in Research and Management of Higher Education .....	40
Table 4.21: ICT Integration in Research and Management of Higher Education .....	41
Table 4.22: ICT Integration in Research and Management of Higher Education .....	42
Table 4.23: ICT Integration on Management of Higher Education.....	43
Table 4.24: ICT Integration on Management of Higher Education.....	44
Table 4.25: Extent of Overall Improvement .....	45
Table 4.26: ICT Integration on the Management of Higher Education .....	45
Table 4.27: ICT Integration on Management of Higher Education.....	46



## LIST OF FIGURES

Figure 1: Conceptual Framework .....	17
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## **ABBREVIATIONS AND ACRONYMS**

<b>ICT</b>	Information communication and technology
<b>IT</b>	Information Technology
<b>SPSS</b>	Statistical package for social sciences
<b>ESP</b>	Economic Stimulus Package
<b>KICD</b>	Kenya Institute of Curriculum Development
<b>PC</b>	Personal Computer
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization
<b>UoN</b>	University of Nairobi

## ABSTRACT

Integration of Information Communication and Technology (ICT) into teaching and learning processes contributes to increase in the interaction and reception of information. The use of ICT in educational settings, by itself acts as a catalyst for change in this domain. The purpose of this study was to establish the influence of Information Communication and Technology on management of higher education in Kenya using a case of the University of Nairobi. The study was guided by four objectives: establishing the influence of online learning options on management of higher education in Kenya; determine the influence of ICT integration in management of higher education in Kenya; assessing the influence of ICT integration in research among institutions of higher learning on management of higher education in Kenya and determining the influence ICT integration in information management on management of higher education among institutions of higher learning. This study used descriptive case study research design because the unit of analysis is one organization. The population of this study composed of the heads of service departments, heads of academic department and the students in the academic departments at the University of Nairobi. A sample of 89 officers and 780 students were selected for the study. Collected data was analyzed and presented in form of tables and charts. The study established that ICT had facilitated Digital learning environment or e-learning which had revolutionized continuing education for learners of all ages. The study further established that ICT integration had allowed for the creation of digital resources where the teachers and professionals could access research material and course material from any place at any time. The study further established that ICT integration had facilitated the networking of researchers and sharing of scholarly material which avoids duplication of work and has provided the necessary infrastructure for providing infrastructure to support digital libraries, virtual learning, research, collaboration and publications. The study concludes that there is a significant relationship between online learning options and management of education in institutions of higher learning. On ICT integration in teaching and learning processes in management of higher education, the study concludes that integration of ICT in teaching and learning processes affects the management of higher education to a great extent. On integration of ICT in information management, the study concludes that it affects the management of education to a great extent. The study also concludes that the overall improvement of the ICT infrastructure in the institution has improved the management of education to a very great extent. The study recommends that the institution carries out a campaign to inform the public of the online learning options available at the institutions. The study further recommends that the institution offers orientation training to the lecturers in the case of a new system or upgrading of the old system. The study also recommends that the institution improves the ICT infrastructure with upgraded operating systems so as to ensure faster performance especially during research. The study also recommends that a survey be conducted to find out ways in which the institutions can improve those processes and procedures.

## **CHAPTER ONE INTRODUCTION**

### **1.1 Background of the Study**

Information and communication technologies (ICT) have become commonplace entities in all aspects of life. According to Daniels (2002) ICTs have become within a very short time, one of the basic building blocks of modern society. Across the past twenty years the use of ICT has fundamentally changed the practices and procedures of nearly all forms of Endeavour within business and governance. Many countries now regard understanding ICT and mastering the basic skills and concepts of ICT as part of the core of education, alongside reading, writing and numeracy. People have to access knowledge via ICT to keep pace with the latest developments (Plomp, Pelgrum and Law, 2007). ICT can be used to remove communication barriers such as that of space and time (Lim & Chai, 2004).

The field of education has been affected by ICTs, which have undoubtedly affected teaching, learning and research (Yusuf, 2005). Education in general is undergoing high transformation because of the developments in Information, Communication and Technology (ICT). Particularly, higher education is undergoing a paradigm shift by integrating technology. Institutions of higher education have begun to realize the importance of adoption and integration of ICT in their management process in the quest to keep pace with the changes in their operating environment. As an open system, these institutions are affected and affect the operating environment (Scott, 2003). ICT have become common place entities in all aspects of life hence the adoption in higher education. Investing in ICT can be considered as physical investments that improve the educational management. First, ICT may act as a means by which to implement interactive learning based on reduced class size approach. The use of ICT in Higher Education is allowing a shift from a teacher-based approach to a student-based approach (Becker, 1997).

The use of ICT in education lends itself to more student-centered learning settings. But with the world moving rapidly into digital media and information, the role of ICT in education is becoming more and more important and this importance will continue to grow and develop in the 21st century. For example, Zeleňáková, Pavolová and Bakalár (2012) points out that ICT has a significant impact in the way teachers and students communicate. Communication in the learning

process provides a transfer of information between university teachers and students. Many institutions are now heavily investing in ICT infrastructure and aim to exploit it to the maximum extent possible. The integration of information and communication technologies can help revitalize teachers and students. This can help to improve and develop the quality of education by providing curricular support in difficult subject areas. To achieve these objectives, teachers need to be involved in collaborative projects and development of intervention change strategies, which would include teaching partnerships with ICT as a tool

A great deal of research has proven the benefits to the quality of education (Al-Ansari, 2006). ICTs have the potential to innovate, accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change (Yusuf, 2005). However, other researches show that there is unclear relationship between the use of Information and Communication Technologies (ICT) and students' performance in Higher Education. Earlier economic research has failed to provide a clear consensus concerning the effect on students' achievement.

ICT increases the flexibility of delivery of education so that learners can access knowledge anytime and from anywhere. It can influence the way students are taught and how they learn as now the processes are learner driven and not by teachers. This in turn would better prepare the learners for lifelong learning as well as to improve the quality of institutions. In concert with geographical flexibility, technology-facilitated educational programs also remove many of the temporal constraints that face learners with special needs (Moore and Kearsley, 1996). Students are starting to appreciate the capability to undertake education anywhere, anytime and anyplace

One of the most vital contributions of ICT in the field of education is- Easy Access to Learning. With the help of ICT, students can now browse through e-books, sample examination papers, previous year papers etc. and can also have an easy access to resource persons, mentors, experts, researchers, professionals, and peers-all over the world. This flexibility has heightened the availability of just-in-time learning and provided learning opportunities for many more learners who previously were constrained by other commitments (Young, 2002). Wider availability of

best practices and best course material in education, which can be shared by means of ICT, can foster better teaching. ICT also allows the academic institutions to reach disadvantaged groups and new international educational markets. As well as learning at anytime, teachers are also finding the capabilities of teaching at any time to be opportunistic and able to be used to advantage. Mobile technologies and seamless communications technologies support 24x7 teaching and learning (Young, 2002). Thus, ICT enabled education will ultimately lead to the democratization of education. Especially in developing countries, effective use of ICT for the purpose of education has the potential to bridge the digital divide.

ICTs also allow for the creation of digital resources like digital libraries where the students, teachers and professionals can access research material and course material from any place at any time (Bhattacharya and Sharma, 2007). Such facilities allow the networking of academics and researchers and hence sharing of scholarly material. This avoids duplication of work (Cholin, 2005). ICT eliminates time barriers in education for learners as well as teachers. It eliminates geographical barriers as learners can log on from any place (Cross and Adam, 2007). ICT provides new educational approaches (Sanyal, 2001). It can provide speedy dissemination of education to target disadvantaged groups (Chandra and Patkar, 2007). ICT enhances the international dimension of educational services (UNESCO, 2002). It can also be used for non-formal education like health campaigns and literacy campaigns (UNESCO, 2002).

Use of ICT in education develops higher order skills such as collaborating across time and place and solving complex real world problems (Lim and Hang, 2003). It improves the perception and understanding of the world of the student. Thus, ICT can be used to prepare the workforce for the information society and the new global economy (Kozma, 2005). Plomp et al., (2007) state that the experience of many teachers, who are early innovators, is that the use of ICT is motivating for the students as well as for the teachers themselves.

Bottino (2003) and Sharma (2003) mention that the use of ICT can improve performance, teaching, administration, and develop relevant skills in the disadvantaged communities. It also improves the quality of education by facilitating learning by doing, real time conversation, delayed time conversation, directed instruction, self-learning, problem solving, information

seeking and analysis, and critical thinking, as well as the ability to communicate, collaborate and learn (Yuen et al, 2003). A great deal of research has proven the benefits to the quality of education (Al-Ansari 2006). Hepp, Hinostroza, Laval and Rehbein (2004), state that the literature contains many unsubstantiated claims about the revolutionary potential of ICTs to improve the quality of education. They also note that some claims are now deferred to a near future when hardware will be presumably more affordable and software will be an effective learning tool.

## **1.2 Statement of the Problem**

According to Cabero (2001), integration of ICT in the management of higher education contributes to increase in the interaction and reception of information. Cabero (2001) further notes that the use of ICT in educational settings, by itself acts as a catalyst for change in this domain. ICTs by their very nature are tools that encourage and support independent learning. Students using ICTs for learning purposes become immersed in the process of learning and more and more students are now using computers as information sources and cognitive tools (Reeves and Jonassen, 1996).

The influence of the technology on supporting how students learn is expected to continue increasing. Kenya has 7 public universities and more than 18 private universities with varying levels of accreditation. According to UNESCO, 90 per cent of the 91 541 tertiary students are enrolled in public universities. In addition to the universities and their constituent campuses, higher education in Kenya includes polytechnics, institutions of science and technology and diploma-level teacher training colleges (Otieno & Ngolovoi, 2009).

The developments and innovations in ICT have facilitated changes in the teaching systems. However, the universities experiences challenges due to many factors. Lack of sufficient equipments for teaching ICT oriented practical work. Lack of ICT trained manpower, lack of uniformity in course contents, proliferation of courses and numbers, lack of accreditation, shortage of budgetary provision among others are some of the problems faced in the integration of ICT. Furthermore, challenges have arisen as a result of ICT such as increase in plagiarism in the universities rather than undertaking research. With these challenges facing the ICT in learning institutions, this raises questions whether the intended goals in education are attained

through the integration of ICT in education. Question of the influence of ICT on management of higher education is therefore an issue of concern. ICT has proved to be part and parcel of modern day education systems and questions have risen as to whether the incorporation of ICT into our educational structures add anything positive, or simply derail the integrity and value of the education systems. This is amid cries within various institutions concerning cases like plagiarism and other academic malpractices that have lowered the standards of education in many institutions.

For example, lectures have been delivered in old fashion class rooms where a lecturer has to be present in order for a lecture to take place. Other institutions adopted virtual learning processes where students can study from their convenient locations online. However, with time and advancements in ICT, the University of Nairobi has been able to take on more students and offer classes online. Limited studies have been done to establish the influence that this adoption of ICT has had on teaching and learning in higher education in Kenya despite the adoption of virtual technology by many institutions of higher learning. It is from this background that this study sought to establish the influence of Information Communication and Technology on management of higher education in Kenya using a case of the University of Nairobi

### **1.3 Purpose of the Study**

The purpose of this study was to establish the influence of Information Communication and Technology on management of higher education in Kenya.

### **1.4 Objectives of the Study**

The study was guided by the following objectives

- i. To establish the influence of online teaching options on management of higher education.
- ii. To determine the influence of ICT integration in teaching and learning process on the management of higher education.
- iii. To assess the influence of ICT integration in research among institutions of higher learning on management of higher education.
- iv. To determine the influence ICT integration in information management on management of higher education.



## **1.5 Research Questions**

This research study sought to answer the following questions;

- i. How do online learning options influence management of higher education?
- ii. What is the influence of ICT integration in teaching and learning process on management of higher education?
- iii. Does ICT integration in research among institutions of higher learning influence the management of higher education?
- iv. How does integration of ICT in information management influence management of higher education?

## **1.6 Significance of the Study**

It is hoped that the findings of this study will be significant in various ways; they may provide greater insight to the administrators and managers of institutions of higher learning into the influence of Information Communication and Technology on management of higher education in Kenya. Secondly, the findings may serve as reference point for ICT managers in different institutions of higher learning in improving management of higher education in their institutions. It is also hoped that the findings would also enlighten managers in institutions of higher learning to address the problem of how to ensure maximum benefit from ICT.

## **1.7 Limitations of the Study**

The researcher encountered cases where the respondents were not truthful, and may have provided what they thought the researcher wanted to hear as opposed to what was the exact situation however the researcher tried to verify all the information received.. Secondly, the study was faced with difficulties in accessing top level management owing to the busy schedule, the researcher however attempted to reach them via electronic means, for instance the use of emails. Finally, some respondents were unwilling to give the much needed information for fear that it would be misused. This occurred when the respondents felt that the information was very delicate and confidential. In order to counter the problem of confidentiality, the researcher carried with him a letter from the university that stated that the research was solely for academic purposes and that any information given would be treated with utmost confidentiality.

### **1.8 Delimitations of the Study**

This study was delimited to the heads of departments at the University of Nairobi's service and academic departments and selected students from every academic department who were ICT compliant. Heads of the departments had been chosen because of their involvement in the ICT integration in the processes management of the University while Students in academic departments had been chosen because they were the direct consumers of University's services. The study was also delimited to the study variables.

### **1.9 Assumptions of the Study**

The researcher assumed that he would get research assistants within the University to help him in collecting data from the respondents. The researcher also assumed that the respondents would understand the questions and respond to the questionnaire truthfully. The researcher also assumed that all the questionnaires would be filled and returned in time.

### **1.10 Definition of Significant Terms used in the Study**

**Effective management:** This is the management which entails carrying out activities in a firm or an organization with the least cost incurred. The levels of results from the actions of employees and managers who demonstrate effectiveness in the workplace help produce high quality results

**Higher Education:** In Kenya, higher education is considered as any post-secondary school education. This is mostly acquired at the universities, colleges and other tertiary institutions

**Information Communication & Technology:** It is a field of work and study that includes technologies such as desktop and laptop computers, software, peripherals, and connections to the Internet that are intended to fulfill information processing.

**ICT integration:** This basically refers to the use of Information Communication Technology in management of higher education.

**Management of Higher Education:** Is the act of running and administering universities, colleges and other institutions of higher learning.

**Online Learning Options:** This is ICT based systems that allow the learners to interact with their teachers, academic managers and fellow learners- for instance through the internet- without having to meet face to face.

**Teaching and Learning process:** The process of teaching or learning at institutions of higher learning using ICT systems.

### **1.11 Organization of the Study**

The study was organized as follows: Chapter One in this study contains background of the study, statement of the problem, objectives of the study, research questions, significance of the study, delimitation and limitations of the study, and assumptions of the study. Chapter Two presents a review of literature and relevant research details associated with the problem addressed in this study, theoretical framework, and conceptual framework and research gaps in the study.

Chapter Three entails the Research methodology used for data collection, research design, target population, sample size and data collection, processing and analysis procedures.

Chapter Four entails the data analysis, presentation, Interpretation and discussion and results of the study that was achieved after the data collection and its analysis.

Chapter Five presents the summary of the findings, conclusions and recommendations and suggestions for further Research studies.

## **CHAPTER TWO LITERATURE REVIEW**

### **2.1 Introduction**

This chapter presents a review of previous literature and empirical study that have been done on the use and integration of ICT into the educational systems at all levels. It reviews the studies that have been done in the past years and whose objectives are related to the ones that this study is set to undertake. Most of this literature is concentrated on the ICT usage and its adoption into the learning systems. Most of this literature tries to elaborate on the importance of ICT as a tool for success in the modern world while others look at issues related to the ICT integration and its benefits in terms of managerial improvement.

### **2.2 Online Learning Options and Management of Higher Education**

Fry (2001) noted a series of benchmarks for ensuring distance, collaborative and e-learning quality. Evaluating program effectiveness includes a documented technology plan, with password protection, encryptions, back-up system and reliable delivery, established standards for course development, design and delivery, good facilitation of interactive and feedback and the application of specific standard for evaluation. Cost-efficient instruction that can match the needs for skills related to technological change should be delivered interactively at the convenience of the learners. To have certain quality, effectiveness in the management should be collaborative with the e-learning platform needs. Roffe (2002) proposed that elements of quality control and assurance system in distance learning should produce learning materials and monitoring correspondence to learning activities.

Luck (2001) examined the effectiveness of the management and application of ICT facilities for working adult learners accessing the distance and collaborative teaching and learning opportunities for development, he found that there is a significant difference among factors stated above with effective management and application of ICT in distance, collaborative and e-learning among the working adult learners. The approaches in teaching and learning are also closely related to the managerial skills in distance, collaborative and e-learning of working adult learners. In addition, the course tutors and instructions are another two essential factors found to be the strong fundamentals of successful implementation of distance, collaborative and e-

learning for the working adult learners. ICT has made it possible to leverage the online environment to facilitate teaching techniques like role-play across time and distance (Wishart, 2007). ICT has promoted online learning options to a great extent. ICT has facilitated Digital learning environment or e-learning which has revolutionized continuing education for learners of all ages. Initiatives across the world include ALA online continuing education of American Library Association and ACRL, Association of College and Research Libraries, Special Library Association e-learning Series and in India, Flexi learn of IGNOU, etc., are few examples of providing open learning space for LIS professionals. MIT, Massachusetts Institute of Technology (USA) and NPTEL, National Programme on Technology Enhanced Learning (India) provide free e-learning modules on different subjects.

ICTs also allow for the creation of digital resources like digital libraries where the students, teachers and professionals can access research material and course material from any place at any time (Bhattacharya and Sharma, 2007; Cholin, 2005). Such facilities allow the networking of academics and researchers and hence sharing of scholarly material. This avoids duplication of work (Cholin, 2005). Online teaching and learning technologies has been enhanced through ICT (Van der Merge & Moeller, 2004).

It is possible to leverage the online environment to facilitate teaching techniques like role-play across time and distance (Wishart, 2007). It can also facilitate the development of scenarios, which can be rarely witnessed in practice. The globalization process has also created a large market of offshore students. To reach them, information technology is the only convenient medium, which can offer education as a service (Collins et al, 2001; Bhattacharya and Sharma, 2007). ICT has provided the necessary infrastructure for providing infrastructure to support digital libraries, virtual learning. A study by Anstine and Skidmore (2005) on on-campus and online courses, one in statistics, and the other in managerial economics found out that within both formats were not significantly different. ICT tends to expand access to education. Through ICT, learning can occur anytime and anywhere. Online course materials, for example, can be accessible 24 hours a day, seven days a week. Teleconferencing classrooms allow both learner and teacher to interact simultaneously with ease and convenience. Based on ICT, learning and teaching no longer depend exclusively on printed materials. Multiple resources are abundant on

the Internet, and knowledge can be acquired through video clips, audio sounds, and visual presentation and so on. Current research has indicated that ICT assists in transforming a teaching environment into a learner-centered one (Castro Sánchez and Alemán, 2011). Since learners are actively involved in the learning processes in ICT classrooms, they are authorized by the teacher to make decisions, plans, and so forth (Lu, Hou and Huang, 2010). ICT therefore provides both learners and instructors with more educational affordances and possibilities.

### **2.3 ICT Integration in Teaching and Learning on Management of Higher Education**

Flecknoe (2002) points out that ICT helps in providing a catalyst for rethinking teaching practice developing the kind of graduates and citizens required in an information society, improving educational outcomes and enhancing and improving the quality of teaching and learning (Wagner, 2001; Garrison & Anderson, 2003). ICT can help deepen students' content knowledge, engage them in constructing their own knowledge, and support the development of complex thinking skills (Kozma, 2005). Studies have identified a variety of constructivist learning strategies such as students working in collaborative groups or students creating products that represent what they are learning that can change the way students interact with the content (Windschitl, 2002).

Becker (2000) found that ICT increases student engagement, which leads to an increased amount of time students spend working outside class. Coates et al. (2004) showed that students in on-campus courses usually score better than their online counterparts, but this difference is not significant here. ICTs especially computers and Internet technologies enable new ways of teaching and learning rather than simply allow teachers and students to do what they have done before in a better way. ICTs have the potential for increasing access to and improving the relevance and quality of education. The use of ICT in educational settings, by itself acts as a catalyst for change in this domain. Students using ICTs for learning purposes become immersed in the process of learning and as more and more students use computers as information sources and cognitive tools (Reeves & Jonassen, 1996), the influence of the technology on supporting how students learn will continue to increase. Oliver, 2000 notes that the integration of information and communication technologies can help revitalize teachers and students. This can help to improve and develop the quality of education by providing curricular support in difficult

subject areas. To achieve these objectives, teachers need to be involved in collaborative projects and development of intervention change strategies, which would include teaching partnerships with ICT as a tool. According to Zhao and Cziko (2001) three conditions are necessary for teachers to introduce ICT into their classrooms: teachers should believe in the effectiveness of technology, teachers should believe that the use of technology will not cause any disturbances, and finally teachers should believe that they have control over technology. However, research studies show that most managers do not make use of the potential of ICT to contribute to the quality of learning environments, although they value this potential quite significantly (Smeets, 2005).

A research by Harris (2002) conducted in three primary and three secondary schools focusing on innovative pedagogical practices involving ICT. Harris (2002) concludes that the benefits of ICT can be gained if confident teachers are willing to explore new opportunities for changing their classroom practices by using ICT. As noted by Wheeler (2001), the use of ICT will not only enhance learning environments but also prepare next generation for future lives and careers. Changed pool of teachers will come with changed responsibilities and skill sets for future teaching involving high levels of ICT and the need for more facilitative than didactic teaching roles (Littlejohn et al., 2002).

ICT can play a valuable role to monitor and log the progress of the students across time, place and varied activities. Mooij (2007) states that differentiated ICT based education can be expected to provide greater reliability, validity, and efficiency of data collection and greater ease of analysis, evaluation, and interpretation at any educational level. In absence of ICT, most of the responsibility of teaching and learning lies on the teachers. However, with the help of ICT one can transfer the responsibilities to the students so that they can self manage. It helps to individualize the teaching or guidance method as per the student's need (Mooij, 2007). It also boosts the confidence level and the self-esteem of the students who acquire the ICT skills through the process of being exposed to such kind of learning (Casal, 2007). Mooij (2007) also puts forth the view that ICT-based registration, evaluation, and administration helps to link different levels of information and facilitate an overall view of the whole educational setup. It facilitates the evaluation and examination of the learning process and results by the students and

the parents in a flexible and convenient way. The use of ICT in higher education has resulted in a move from teacher-centred delivery and transmissive learning to student-centred learning. ICT functions as information sources and cognitive tools, supporting and enabling students to be responsible for their own learning (Jonassen & Reeves, 1996). Hattangdi and Ghosh (2005) used the terms informative, situating and constructive tools to further define the functions of ICT. Learning environments become inquiry-based and problem-centred within authentic settings. Lecturers are facilitators, coaches and mentors and ICTs support the learning environment (Oliver, 2000).

#### **2.4 ICT Integration in Research on the Management of Higher Education**

The field of education has been affected by ICTs, which have undoubtedly affected teaching, learning, and research (Yusuf, 2005). In the education sector, tertiary institutions use computers in their academic programs in order to produce good quality of research output and learning. The adoption and use of ICTs in education have a positive impact on teaching, learning, and research. As noted by Bhattacharya and Sharma (2007), ICTs also allow for the creation of digital resources like digital libraries where the students, teachers and professionals can access research material and course material from any place at any time which enhances the level of research as a result of availability of research materials. Such facilities allow the networking of academics and researchers and hence sharing of scholarly material which avoids duplication of work hence a key support to the levels of research (Cholin, 2005).

Use of ICT in education develops higher order skills such as collaborating across time and place and solving complex real world problems (Bottino, 2003). It improves the perception and understanding of the world of the student. Thus, ICT can be used to prepare the workforce for the information society and the new global economy (Kozma, 2005). ICT has provided the necessary infrastructure for providing infrastructure to support digital libraries, virtual learning, research, collaboration and publications. Students are now more frequently engaged in the meaningful use of computers (Castro, Sánchez and Alemán 2011). They build new knowledge through accessing, selecting, organizing, and interpreting information and data. Based on learning through ICT, students are more capable of using information and data from various sources, and critically assessing the quality of the learning materials and enhancing research.



One of the most vital contributions of ICT in the field of education is- Easy Access to Learning. With the help of ICT, students can now browse through e-books, sample examination papers, previous year papers etc. and can also have an easy access to resource persons, mentors, experts, researchers, professionals, and peers-all over the world. This flexibility has heightened the availability of just-in-time learning and provided learning opportunities for many more learners who previously were constrained by other commitments (Young, 2002).

## **2.5 ICT Integration in Information Management in Higher Education**

Information and Communication Technology (ICT) plays a vital role in supporting powerful, efficient management and administration in education sector. It is specified that technology can be used right from student administration to various resource administration in an education institution (Christiana Maki 2008). Young, 2002, notes that computers can be used extensively for educational administration which enhances provision of quality education.

Moreover many studies revealed the need for ICT integration into administrative activities of higher education institutions. According to Caroline Salerno (2009), the various ways of introducing technology in education institution administration are such as submission of lesson plans through e-mail, creation of a class Web page by teachers, attendance to technology conferences to see what other schools are doing, what other teachers are doing to integrate technology, and what principals are doing to encourage the use of technology in their schools and classrooms and admissions through web-enabled services.

According to Zainally (2008), Information and Communication technology provides several facilities and possibilities for educational administrators to do their tasks. There is a mention that communication and information systems have changed the very nature of higher education, allowing information to be transferred, stored, retrieved, and processed by almost all who work, study or interact with a given institution. Kumar and Kumar (2005) noted that information and communication technologies have an impact on increase of the scientific level of faculty members, students, and staff.

## **2.6 Theoretical Framework**

The study is founded on three theories including diffusion of innovation, contemporary learning theory and technology acceptance model. These theories are discussed in details below:

### **2.6.1 Diffusion of Innovation Theory**

This theory was conceptualized by Rodgers in 2003. With the ongoing development of ICT and the diversification of the fields it affects, various theoretical studies have been carried out in order to ensure better understanding concerning its diffusion, adoption, acceptance, and usage (Rogers, 2003). In this study, the concept ICT “usage” is preferred since it is believed that usage is an indicator of adoption, acceptance as well as diffusion. In his Diffusion of Innovation (DoI) theory Rogers (2003) mentions that the rate of adoption is partially influenced by perceived attributes named as innovation characteristics which are relative advantage, compatibility, trialability, complexity, and observability. The relative advantage, compatibility, trialability, observability of an innovation, as perceived by members of a social system, are positively related to its rate of adoption; on the other hand the complexity of an innovation, as perceived by members of a social system, is negatively related to its rate of adoption.

The theory is used to explain the diffusion of innovation in numerous fields such as medicine, agriculture, and information technologies. Rogers (2003,) stated that the first research on attributes of innovation and their rate of adoption was conducted with farmers, but studies of teachers and school administrators suggested that similar attributes predict the rate of adoption for educational innovation. Bussey, Dormody, and VanLeeuwen (2000) stated that the strongest predictor of the level of adoption of technology education was the perception of the teacher of the attributes of technology education. The researchers also concluded that Rogers’ theory of perceived attributes can be a valuable tool for instructional developers working to increase the utilization of their products.

### **2.6.2 Contemporary Learning Theory**

Contemporary learning theory was designed by Duffy and Cunningham in 1996 and is based on the notion that learning is an active process of constructing knowledge rather than acquiring knowledge and that instruction is the process by which this knowledge construction is supported

rather than a process of knowledge transmission (Duffy & Cunningham, 1996). Contemporary Learning Theory recognizes the role that both experience and reflection play in the development of ideas and skills. In this domain learning is viewed as the construction of meaning rather than as the memorization of facts (Jonassen & Reeves, 1996).

Learning approaches using contemporary ICTs provide many opportunities for constructivist learning through their provision and support for resource-based, student centered settings and by enabling learning to be related to context and to practice (Berge, 1998). As mentioned previously, any use of ICT in learning settings can act to support various aspects of knowledge construction and as more and more students employ ICTs in their learning processes, the more pronounced the impact of this will become. Teachers generate meaningful and engaging learning experiences for their students, strategically using ICT to enhance learning (Barron, 1998). Students enjoy learning, and the independent enquiry which innovative and appropriate use of ICT can foster. They begin to acquire the important 21st century skills which they will need in their future lives

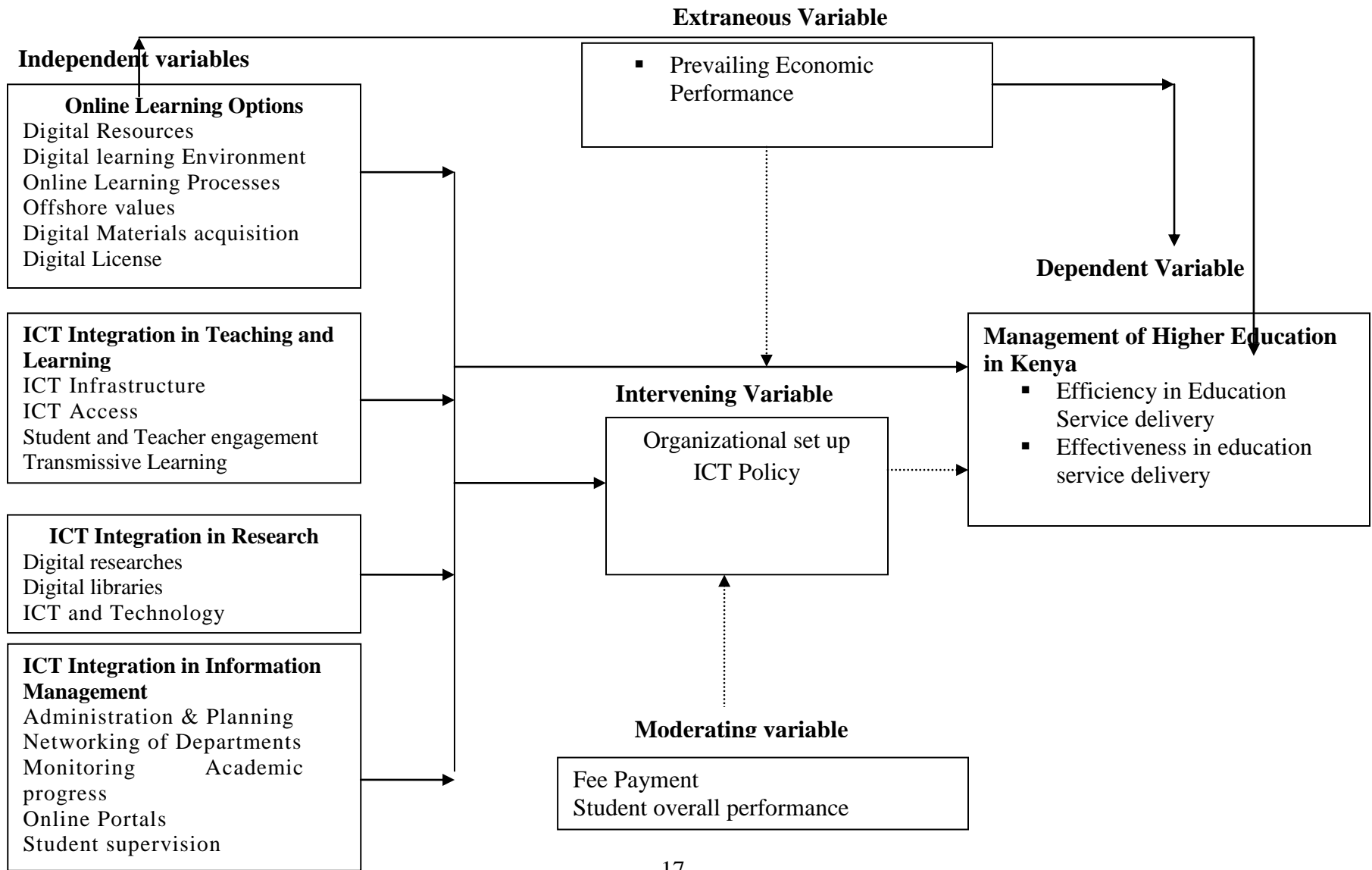
### **2.6.3 Technology Acceptance Model by Venkatesh, Morris, Davis and Davis 2003**

Technology Acceptance Model (TAM) deals with the prediction of the acceptability of an information system. TAM is an adaptation of the Theory of Reasoned Action (TRA) to the field of information systems (Brown and Venkatesh, 2005). The purpose of this model is to predict the acceptability of a tool and to identify the modifications which must be brought to the system in order to make it acceptable to users. This model suggests that the acceptability of an information system is determined by two main factors: perceived usefulness and perceived ease of use (Venkatesh, Morris, Davis and Davis, 2003). TAM posits that perceived usefulness and perceived ease of use determine an individual's intention to use a system with intention to use serving as a mediator of actual system use. Perceived usefulness is also seen as being directly impacted by perceived ease of use (Venkatesh, Morris, Davis and Davis, 2003).

## **2.7 Conceptual Framework**

The interrelationship between study variables was conceptualized as shown in the figure below:

**Figure 2.1: Conceptual Framework**



## 2.8: Knowledge Gaps

The gaps identified in reviewed literature on every variable are summarized in the table 2.1:

**Table 2.1: Gaps identified in literature review**

<b>Variable</b>	<b>Author( s)</b>	<b>Finding</b>	<b>Gap</b>
Online teaching and Learning and management of Higher Education	Fry 2001 Cholins, 2001 Luck( 2001) Roffe (2002) Skidmore (2005) Wishart 2007	To have certain quality, effectiveness ii management should collaborate with the e-learning platforms and needs. Elements of quality control and assurance system in e-learning should produce materials and monitoring correspondence.	There is need to create more online teaching and learning platforms for multiple users. There is need to upscale and further investigate findings of other authors so as to strengthen online teaching options in higher learning institutions in Kenya.
ICT integration in teaching and learning processes and management of Higher Education	Casal, 2007 Mooij (2007) Anstine and Skidmore (2005) Wishart 2007 Muller, 2004	Differentiated ICT based education can be expected to provide greater reliability, validity, and efficiency of data collection and greater ease of analysis, evaluation, and interpretation at any educational level	Class use of technologies was affected by teachers' attitudes towards ICT in most institutions. There is need therefore to examine this integration further.
ICT integration in research and management of Higher Education	Bhattacharya and Sharma (2007), Yusuf, 2005 Cholin, 2005 Castro, Sánchez and Alemán 2011) Bottino, 2003	Positive attitudes towards ICT or constructivist perspectives on learning will not automatically lead to the uptake of ICT or innovative in research and technology integration.	Correlation between research and ICT integration in research needs to be investigated further.
ICT integration in Information Management and management of Higher Education	Christiana Maki 2008). Young, 200, Caroline Salerno (2009), Zainally, 2008	Policy and leadership is key to successful integration of information management	There is need to investigate the aspect of ICT integration more particularly in university education

## **2.9 Summary of Literature Review**

This chapter has given a literature review on the influence of information communication on management of higher education in Kenya regarding to the online learning options, ICT integration in teaching and learning, ICT integration in research and ICT integration in information management. Gwang-Jo Kim (2009), found that ICT in Education can restructure education system, Diversify teaching-learning methods and practices, Engage all stakeholders of education and adapt rapidly to changes in society and the environment, and Enhance education efficiency, effectiveness, and productivity. Esque (2009) sees three key investment components in long term economic growth. She believes that Investment in knowledge leads to sustained economic growth, Knowledge economy framework, and Educational reforms to build relevant skills. Song (2009) thinks that ICT in Education has three main goals which include Individual development, Education reform, and Social and Economic growth.

As learning shifts from the “teacher-centered model” to a “learner-centered model”, the teacher becomes less the sole voice of authority and more the facilitator, mentor and coach. The teacher’s primary task becomes to teach the students how to ask questions and pose problems, formulate hypotheses, locate information and then critically assess the information found in relation to the problems posed”. This may be easier said than done because of the nature of culturally-specific traditions that have characterized teaching and learning practices for years in the Kenya. In Kenya Teachers often view their role as “provider of knowledge” and regard students as empty vessels to be filled. Therefore, ICT Integration could be seen as a whole configuration of events, activities, contents, and interpersonal processes taking place in the context in which ICT is used. However, the right conditions need to be in place before the educational benefits of ICT can be fully harnessed, and a systematic approach is required when integrating ICTs into the education system.

## **CHAPTER THREE RESEARCH METHODOLOGY**

### **3.1 Introduction**

The chapter discusses the methodology that was followed in the process of conducting the study, the research design, the target population, sample, sampling method, data type and source, methods of data analysis and the techniques.

### **3.2 Research Design**

This study used descriptive survey research design. According to Gatara (2010), descriptive design is appropriate because it is less expensive and can enable the researcher to examine data from a wider area within a short time. A descriptive design provides qualitative or numeric descriptions of trends, attitudes and perceptions of the population by studying a sample of that population (Kothari, 2008; Best & Khan, 2003). Since this study was interested in determining the influence of the independent variables on the dependent variable without manipulating any variable, the research design was suitable since it focuses on the current phenomenon in regard to the influence of Information Communication and Technology on the management of higher education in Kenya.

### **3.3 Target Population**

A population also known as a “universe” refers to all the items in the field of inquiry (Kumar, 2008). The population of this study was composed of the seventy eight heads of the Academic Departments, Eleven heads of the Service Departments and the students in the Academic Departments of the University of Nairobi. The heads of departments had been chosen upon because of their involvement in the ICT integration into the processes of the university management while the students were selected because of their involvement in receiving services delivered through ICT.

### **3.4 Sampling Size and Sampling Procedure**

Sampling is the process of selecting units from a population of interest (Trochim, 2005). The researcher used stratified random sampling where the population was divided into four strata which comprised of first year of study, second year of study, third year of study and final year of study for the students in the Academic Departments. The advantage of sampling is that by

selecting a part of the subject on which measurement was being taken in a population, a conclusion was drawn about the entire population. This method was also economic and time saving.

The selection of a sample from a defined target population requires the construction of a sampling frame. The sampling frame is commonly prepared in the form of a physical list of population elements. It is from this list that members are selected to join the sample (UNESCO, 2005). In this study, the sampling frame consisted of all the heads of service and academic departments and the students in the academic department at the University of Nairobi.

### **3.4.1 Sample Size**

The stratified random sampling was used by the researcher to sample 78 heads of academic departments, 11 heads of service departments and 780 students from the academic departments whereby 10 students from each of the 78 academic departments were purposively sampled. Two students were selected from each year of study. This sample size was generated as indicated in the sampling procedure and designs sections.

### **3.4.2 Sampling Procedure**

The study used stratified the population into strata with year of study for students as the sampling frame while employment position for the staff served as the sampling frame. The study then used simple random sampling technique to select the students to participate in the study. Simple random sampling ensured that every member of the population had an equal chance of being included in the study.

### **3.5 Research Instruments**

This study utilized a questionnaire as a primary tool for data collection. The questionnaire contained both structured and unstructured questions meaning had both open-ended and close-ended questions. The questionnaire contained 5 sections that entailed systematic and pre-determined questions that were presented with exactly the same wording and in the same order to all respondents.



For the closed-ended questions, a Five-point Likert Scale will be used which will include: (1) Strongly Agree, (2) Agree, (3) Uncertain, (4) Disagree and (5) Strongly Disagree. The strongly agreed responses were scored at 5 for direct positive responses while those of strongly disagree were scored at 1 for direct negative responses. Closed ended questions were also included. The questionnaire facilitated the evaluation of the phenomenon under study and was self-administered. This was done so as enhance objectivity and ensure that participants answered the same questions thus preventing bias. The procedure for data collection ensured compliance to the procedure put in place by the National Science and Technology Council, the University of Nairobi and ethics in social science research.

### **3.5.1 Pilot-testing of the Research Instrument**

A pilot study was carried out two weeks prior to the main study. The researcher randomly picked 10 respondents and administered the questionnaire to them so as to find out if the questionnaire was sufficient. This process entailed a small-scale trial, where a few respondents took the test and commented on the mechanics of the test and pointed out any problems with the test instructions, instances where items were not clear and help the researcher format the questionnaire and remove any noted typographical errors and inconsistencies.

The primary purpose of pilot-testing of the research instrument was to construct an initial picture of test validity and reliability. Again, pilot testing is usually undertaken to elicit appropriate responses to the study so as to determine if questions asked were relevant and appropriate. Pilot testing also helps to check on the clarity and suitability of the wording in the questionnaire (Basavanthappa, 2007). Information from the pilot study was cross-checked to establish the deficiencies in the instruments. Corrections and modifications were therefore be undertaken to correct any anomalies noted on the instrument before it was administered.

### **3.5.2 Validity of the Research Instrument**

Instruments validity refers to appropriateness, meaningfulness and usefulness of inferences a researcher makes based on data collected. Validity has to do with how accurately the data obtained in the study represents the variables of the study to ascertain the appropriateness of a research instrument. In this study, the researcher ensured validity of the instrument by engaging

both content and constructs validity. Content validity, also known as logical validity refers to the extent to which elements within a measurement procedure are relevant and representative of the construct that they purport to measure (Haynes *et al.*, 1995).

Construct validity, on the other hand, refers to the degree to which inferences can legitimately be made from the operationalization in a study to the theoretical constructs on which that operationalization was based. Construct validity involves generalizing from a program or measures to the concept of a program. Constructs are abstractions that are deliberately created by researchers in order to conceptualize the latent variable, which is the cause of scores on a given measure. Construct validity examines the question: Does the measure behave like the theory says a measure of that construct should behave? This type of validity is therefore essential to the perceived overall validity of the test.

Instruments validity therefore, involves establishing whether the data collection instruments have the requisite capacity to measure what they are intended to. Validity is the most critical criterion of sound management and indicates the degree to which an instrument measures what it purports to determine (Kothari 2004).

### **3.5.3 Reliability of the Research Instrument**

Reliability is the consistency of measurement, or the degree to which an instrument measures the same way each time it is used under the same condition with the same subjects. A reliable instrument is one with small errors of measurement, one that shows stability, consistency and dependability of scores for individuals on the trait, characteristic or behavior being assessed. Reliability of a research instrument is its ability to give consistent results over a number of repeated trials (Mugenda & Mugenda, 1999).

This study utilized split half method to obtain reliability of the research instrument. The first step under split half methodology involved administering the instrument to 1% of the sample size. The responses were then scored and split into two on the basis of odd and even numbers. Pearson product moment correlation coefficient was then be computed for the two groups using Pearson (r) formula:

$$\frac{\Sigma XY - \frac{(\Sigma X)(\Sigma Y)}{N}}{\sqrt{\left[ \frac{\Sigma X^2 - (\Sigma X)^2}{N} \right] \left[ \frac{\Sigma Y^2 - (\Sigma Y)^2}{N} \right]}}$$

**Where**

**r** = Pearson product moment correlation coefficient

**Y**= score in odd number questionnaire items;

**X**= score in even number questionnaire items;

**N**= Number of respondents.

Spearman Brown Prophecy formula was then used to compensate for the reduction of the instruments to one half of the final length. This yielded the reliability coefficient (re) for the full length which was given by the formula:

$$re = \frac{2r}{r-1}$$

**Where**

**r** = Spearman Correlation Coefficient between the two halves where the first half was odd numbers and the second half was even numbers.

**re**=the reliability co-efficient for the full length.

After calculation my reliability coefficient was found to be 0.75, meaning my instrument was deemed reliable

**3.6 Data Collection Procedures**

After successfully defending the proposal both at the department and school level, the researcher sought an authority to conduct research at the University of Nairobi. The process of data collection begun by administering self administered questionnaires, in some cases research assistants (two enumerators indentified in advance for this purpose) were used to help in speedy administration and collection of questionnaires. Questionnaires were hand delivered and collected later after an agreed duration. In order to ensure that the questionnaires reached as many respondents as possible, the researcher made follow ups on daily basis on the progress made. Judgment was then made on who was responding adequately and giving appropriate answers. The entire data collection exercise took 1 Month.

### **3.7 Methods of Data Analysis**

Data analysis was done following the four phases normally used in many research projects. They include: data clean up, reduction, differentiation and explanation. Data clean up involved editing, coding and tabulation to detect any anomalies. All data was keyed using the Statistical Package for Social Scientists (SPSS) version 20.0 with appropriate codes and variable specification. The data was then counter-checked for possible erroneous entries where appropriate corrections were made.

Data was analyzed based on the themes of the research objectives. The specific effect of independent variables vis-à-vis the dependent variable was tested through multivariate analysis while the significance of the independent variables against the dependent variable was analyzed through the Analysis of Variance (ANOVA).

### **3.8 Operational Definition of Variables.**

Operational definition of both independent and dependent variables is as shown on table below

**Table 3.1: Operationalization of Variables**

<b>Research Varriable</b>	<b>Type of variable</b>	<b>Indicator</b>	<b>Data collection Methods</b>	<b>Scale of measurement</b>	<b>Types of Analysis</b>	<b>Level of Analysis</b>
Influence of online learning options on management of higher education.	Independent variable	Online Learning Options	Questionnaires, interviews Observation	Nominal Ordinal	Non-Parametric (Mean and Variance)	Descriptive
Influence of ICT integration on teaching and learning on managing higher education	Independent variable	ICT integration in teaching and learning process	Questionnaires, interviews Observation	Nominal Ordinal	Non-Parametric (Mean and Variance)	Descriptive
Influence of ICT integration in research among institutions of higher learning on management.	Independent variable	ICT integration in research	Questionnaires, interviews Observation	Nominal Ordinal	Non-Parametric	Descriptive
Influence ICT integration in information management of higher education among institutions of higher learning.	Independent variable	ICT integration in information management	Questionnaires, interviews Observation	Nominal Ordinal	Non Parametric	Descriptive
Management Higher Education	Dependent variable	management higher education	Documentary Analysis	Nominal	Non-Parametric Parametric	Descriptive

## CHAPTER FOUR DATA ANALYSIS, PRESENTATION AND INTERPRETATION

### 4.1 Introduction

This chapter presents analysis, findings and discussion of the study.

### 4.2 Questionnaire Response Rate

The study targeted a sample of 78 heads of academic departments, 11 heads of service departments and 780 students. Out of the total target population of 869, only 574 respondents filled and returned their questionnaires. Of the 574, 74 were head of departments and 500 were students. This gave the study a response rate of 66%. According to Mugenda and Mugenda (2003) the statistically significant response rate should be at least 50%. These findings are well illustrated in the Table 4.1.

**Table 4.1: Response Rate**

<b>Responses</b>	<b>Frequency</b>	<b>Percent</b>
Response	574	66%
Non Response	295	34%
<b>Total</b>	<b>869</b>	<b>100%</b>

### 4.3 Demographic Information of the Staff.

#### 4.3.1: Gender Characteristics of Respondents.

The findings are shown in the Table 4.2.

**Table 4.2: Distribution of respondents by Gender**

<b>Gender</b>	<b>Frequency</b>	<b>Percent</b>
Male	41	56%
Female	33	44%
<b>Total</b>	<b>74</b>	<b>100%</b>

Both male and females were included in the study. The majority of the respondents were males at 56% while the females were 44%. This shows that the University of Nairobi as an institution has more than a third of the management in the heads of departments as females a requirement of the constitution of Kenya.

### 4.3.2: Level of Education

The head of departments were asked their level of education. The responses are shown in the table 4.3.

**Table 4.3: Level of Education**

	Frequency	Percent
Secondary level	0	0
bachelors degree	4	5
Masters degree	34	46
PhD holder	26	35
Other certification (specify)	10	14
Total	74	100

There were no HODs with secondary level as their highest level of education, 46% had Masters Degree, 35% were PHD holders, and 14% had other qualifications while 5% had bachelors' degree. Those who had other qualifications listed having pursued professional courses such as CPA (K), CIPS, ACCA and CISA. Others had other management certifications as well as post graduate diplomas. The involvement of respondents with various academic qualification brought insights on different levels of expertise into the study.

### 4.3.3: Number of Years Worked at the University

The respondents were asked the number of years they had worked at University of Nairobi.

**Table 4.4: Number of years Worked at the University**

	Frequency	Percent
Below 3 years	10	14
4-6 years	23	31
7-10 years	28	38
Above 10 years	13	18
Total	74	100

From the responses 38% had worked between 7-10 years, 31% had worked for 4-6 years, 18% had worked for above ten years while 14% had worked for less than 3 years at UON.

#### **4.3.4: Number of Years worked in the ICT Field**

The respondents were asked the number of years they had worked in the ICT field the responses are in the table 4.5.

**Table 4.5 : Number of Years worked in the ICT Field**

	Frequency	Percent
Below 5 years	7	9
5-10 years	20	27
10-15 years	33	45
Above 15 years	14	19
Total	74	100

From the findings, 45% had worked for 10-15 years, 27% had worked for 5-10 years, while 19% had worked for more than 15 years. The respondents who had worked in the ICT field for less than 5 years were 9%. The difference in the number of years worked by the respondents in the ICT field brings in different levels of expertise insight on ICT and higher education.

#### **4.4: Demographic Information of the Students**

##### **4.4.1: Distribution of respondents by Gender**

The respondents were asked to indicate their gender. The responses are in the Table 4.6.

**Table 4.1: Gender of the respondents**

Gender	Frequency	Percent
Male	315	63%
Female	185	37%
Total	500	100%



Majority of the students interviewed were males at 63% and the female students were 37%. This shows that the student population interviewed included males and females though the majority was male.

#### 4.4.2: Year of Study

The study sought to find out the year of study the students interviewed were. The responses are in the Table 4.7.

**Table 4.2: Year of the study**

Year of study	Frequency	Percent
1st year	60	12%
2nd year	115	23%
3rd year	75	15%
4th year	150	30%
5th year	100	20%
Total	500	100%

From the Table, the highest number of respondents was 4<sup>th</sup> years at 30%, followed by 2<sup>nd</sup> years and 5<sup>th</sup> years at 20% respectively. The respondents in their third years made up 15% while those in their first year of study were 12% of the respondents. These findings show that the respondents were evenly distributed across all years of study. 5<sup>th</sup> years were a majority because they had been long enough in the Institution hence understood more on the transformation going on in the Institution on Information technology front.

#### 4.4.3: Student Respondents

The study included respondents from all the departments at the University of Nairobi. The list of the departments is in appendix IV.

## 4.5 Students' use of ICT Facilities

### 4.5.1: Rate of Using ICT Facilities

The study asked the students the rate at which they used the university ICT facilities. The responses are in the Table 4.8.

**Table 4.3: Rate of Using ICT Facilities**

<b>Usage Frequency</b>	<b>Frequency</b>	<b>Percent</b>
Daily	350	70
Weekly	140	28
Monthly	10	2
<b>Total</b>	<b>500</b>	<b>100</b>

### 4.5.2: Reason for Using ICT Facilities

The students were asked to give the purpose for which they used the ICT facilities. The responses are shown in the figure below.

The students who used the ICT facilities for assignments were 52%, 38% used it for research and 10% used it for other purposes. Those who said other purposes listed social networking, blogging and communication purposes.

**Table 4.4: Reason for using ICT Facilities**

<b>Reason for using ICT Facilities</b>	<b>Frequency</b>	<b>Percent</b>
Research	190	38
Assignment	260	52
Other	50	10
<b>Total</b>	<b>500</b>	<b>100</b>

### 4.5.3 Influence of Online Learning Options on the Management of Higher Education

The respondents were given several statements on the influence of online learning options on the Management of higher education to rate the extent to which they agree with the statements on a scale of 1-5 where 1= strongly agree, 2= agree, 3= neutral, 4= disagree and 5= strongly disagree.

**Table 4.5: Online Learning and Management of Higher Education**

	Mean	S. dev
ICT has facilitated Digital learning environment or e-learning which has revolutionized continuing education for learners of all ages	2.31	0.14
ICT has allowed for the creation of digital resources like digital libraries where the students, teachers and professionals can access research material and course material from any place at any time	2.15	0.92
ICT has provided a platform for the networking of researchers and hence sharing of scholarly material	2.34	0.32
Development of ICT infrastructure at UON has enhanced online teaching and learning	2.11	0.45
Through ICT, learning can occur anytime and anywhere as it has facilitated online course materials that are accessible 24 hours	2.65	0.21
Learning and teaching no longer depends exclusively on printed materials due to multiple resources available online.	2.54	0.85
Online teaching options have provided instructors with easier and convenient teaching possibilities	2.45	0.19
Development of ICT infrastructure has made it easier for supervising students' proposal and research works by the supervisors.	2.55	0.27

The head of departments strongly agreed that the Development of ICT infrastructure at UON, has enhanced online teaching and learning, allowed for the creation of digital resources like digital libraries where the students, teachers and professionals can access research material and course material from any place at any time and provided a platform for the networking of researchers and hence sharing of scholarly material with means of 2.31, 2.15 and 2.34 respectively. The heads of departments also strongly agreed that the development of ICT infrastructure has enhanced online teaching and learning with a mean of 2.11.

These findings agree with those of Cholin (2005) who concluded that online learning options had influenced the management by provision of better infrastructure in learning such as creation of digital libraries, networking and availability of research materials that can easily be accessed. Asked whether learning can occur anywhere and anytime through ICT the respondents agreed with a mean of 2.65. According to Bhattacharya and Sharma, (2007) online learning options ease the learning process due to the flexibility of the online platform that allows lecturing to be conducted over the internet. The head of departments also agreed that learning and teaching no

longer depends exclusively on printed materials due to multiple resources available online and that online teaching options have provided instructors with easier and convenient teaching possibilities with means of 2.54 and 2.45 respectively. The internet provides the students with a lot of access to materials both recent and historical pieces through the search engines.

#### **4.5.4: Online Learning Options and Management of Higher Education at UON**

The respondents were asked the extent to which online learning options influenced the management of higher education at UON. The responses are in the table below.

**Table 4.6: Online Learning Options and Management of Higher Education**

	Frequency	Percentage
Very great extent	16	22
Great extent	32	43
Moderate extent	10	14
Little extent	11	15
No extent at all	5	7

The highest percentage, 43%, of the head of departments interviewed said that online learning options influenced the management of higher education to a great extent, 22% said to a very great percent, 15% said to a little extent, 14% to a moderate extent while 7% said to no extent. The respondents were also asked to what extent learning options has made it easier for the department to manage students' academic reports. These findings are consistent with those of (Wishart, 2007) who cited that ICT promoted learning options to a great extent and thus provided a digital learning environment that facilitated better management systems in education.

**Table 4.7: Ease of Managing Academic Reports**

	Frequency	Percentage
Very great extent	45	61
Great extent	10	14
Moderate extent	10	14
Little extent	5	7
No extent at all	4	5

From the responses the majority of the head of departments 61% agreed that online learning options has eased the managing of academic reports to a very great extent. An equal proportion of 14% said to a great a moderate extent each. 7% said to a little extent and 5% said to no extent at all. According to Christiana Maki (2008) technology can be used right for student records management and also in various resource administrations in an education institution.

#### 4.5.5: Students Views

##### 4.5.5.1: Influence of Online Learning Options on the Management of Higher Education

The students were asked to rate the extent to which they agreed with the following statement on influence of learning options on the management of higher education on a scale of 1-5 where 1= strongly agree, 2= agree, 3= neutral, 4= disagree and 5= strongly disagree.

**Table 4.8: Online Learning Options and Management of Higher Education**

	Mean	Std. Dev
ICT has facilitated Digital learning environment or e-learning which has revolutionized continuing education for learners of all ages.	2.68	0.12
ICT has facilitated the creation of digital resources like digital libraries where the students, can access research material from any place at any time	2.44	0.35
Online learning processes has allowed for the networking of academics through shared scholarly materials	2.31	0.98
Online learning processes have created an online environment that facilitates teaching techniques across time and distance.	2.24	0.45
ICT integration has made it easier for students to access course materials any time	1.23	0.62
The globalization brought about by the ICT integration process has created a large market of offshore students.	2.89	0.48
ICT tends to expand access to education	1.66	0.52
Teleconferencing classrooms allow both learner and teacher to interact simultaneously with ease and convenience	2.56	0.68
Due to ICT integration learning and teaching no longer depend exclusively on printed materials	1.65	0.71
ICT integration has assisted in transforming the teaching environment into a learner-centered one	2.43	0.39
Learners are actively involved in the learning processes in ICT classrooms	1.98	0.47

The students strongly agreed that Online learning processes has allowed for the networking of academics through shared scholarly materials and has created an environment that facilitates teaching techniques across time and distance with means of 2.31 and 2.24 respectively. The internet is a great sources of scholarly materials especially those that are no longer available in print. According to Cholin (2005) the internet has created digital libraries where the students, teachers and professionals can access research material and course material from any place at any time. The respondents also strongly agreed that ICT has expanded access to education with learners being actively involved in the learning processes in classrooms and that learning and teaching no longer depend exclusively on printed materials with means of 1.66, 1.65 and 1.98 respectively (Van der Merge & Moeller, 2004).The respondents were indecisive on whether ICT has facilitated Digital learning environment or e-learning which has revolutionized continuing education for learners of all ages and whether globalization brought about by the ICT integration process has created a large market of offshore students with means of 2.68 and 2.89 respectively. The students were also indecisive as to whether teleconferencing classrooms allow both learner and teacher to interact simultaneously with ease and convenience with a mean of 2.56. According to Cholin (2005) online learning options allow for the networking of academics and researchers and hence sharing of scholarly material. The options also allow for learning to occur anywhere as well as facilitate simultaneous learning and teaching with ease (Anstine and Skidmore, 2005).

#### **4.5.5.2: Online Learning Options at UON**

The students were asked whether they were aware of the online learning options at UON. The responses are shown in the Table 4.14.

**Table 4.9: Online Learning at UoN**

Awareness of online learning options	Frequency	Percent
Yes	480	96
No	20	4
Total	500	100

The respondents who were aware of the online learning options at UON were 96% while only 4% were not aware of the options available at UON. The students were further asked to list ways in which online learning options have influenced Management of education at UON, the responses included there has been easier retrieval of academic reports from the online database. The respondents also said that online learning options are very convenient and time saving since one does not have to be physically present at the campus and can thus manage to work as they learn. Other students felt that the integration of online learning provided them with a wider scope of learning materials and resources.

#### **4.5.5.3: Online Learning Options and Management of Education**

The students were asked the extent to which they thought that online learning options influenced the management of education at UON.

**Table 4.10: Online Learning Options and Management of Education**

	Frequency	Percentage
Very great extent	158	32
Great extent	287	57
Moderate extent	28	6
Little extent	17	3
No extent at all	10	2

From the responses 57% said to a great extent, 32% of the students said that online learning options influenced the management of education to a great extent, 6% said to a moderate extent, 3% said to little extent and 2% said to no extent at all.

### **4.6: ICT Integration in Learning Process on the Management of higher education**

#### **4.6.1 Head of Department Views**

##### **4.6.1.1: Influence of ICT Integration in Learning on the Management of higher education.**

The respondents were asked to rate the extent to which they agreed with the statements below on a scale of 1-5 with 1= strongly agree, 2= agree, 3= neutral, 4= disagree and 5= strongly disagree.

**Table 4.11: Integration of ICT in Teaching and Learning**

	Mean	Std. Dev
Integration of ICT in teaching acts a catalyst for rethinking of teaching practices by lecturers	1.25	0.65
Integration of ICT in teaching and learning has enhanced and improved the Management of teaching and learning.	2.15	0.23
ICT integration in the teaching process has created the potential for access to relevant of education	2.98	0.54
ICT integration in the teaching process has improved the Management of education offered at UON by providing curricular support in difficult subject areas.	1.62	0.98
Integration of ICT in teaching has enabled the lecturers monitor and log the progress of the students across time, place and varied activities	1.98	0.45
Integration of ICT has made it possible for the instructors' transfer some of the responsibilities to the students to self manage.	2.56	0.62
ICT integration has facilitated the evaluation and examination of the learning process and results by the administration in a flexible and convenient way.	2.34	0.31
Learning environments become inquiry-based and problem-centered within authentic settings as a result of ICT integration.	2.38	0.75

The head of departments strongly agreed that integration of ICT in teaching acts a catalyst for rethinking of teaching practices by lecturers with a mean of 1.25 (Flecknoe 2002). On whether Integration of ICT in teaching and learning has enhanced and improved the Management of teaching and learning, the responses scored a mean of 2.15 thus an indication that the head of departments strongly agreed. The respondents also strongly agreed that ICT integration in the teaching process had improved the Management of education offered at UON by providing curricular support in difficult subject areas, facilitated the evaluation and examination of the learning process and results by the administration in a flexible and convenient way and the environment had become an inquiry-based and problem-centered within authentic settings as a result of ICT integration with means of 1.62,2.34 and 2.38 respectively. These findings are consistent with those of Oliver (2000) who noted that the integration of information and communication technologies can help revitalize teachers and students. This can help to improve and develop the quality of education by providing curricular support in difficult subject areas. The respondents were indecisive as to whether ICT integration in the teaching process has created the potential for access to relevant of education and whether it had made it possible for the instructors' transfer some of the responsibilities to the students to self manage.



## 4.6.2 Students Views

### 4.6.2.1: Influence of ICT Integration in Teaching and Learning Process

The students were asked to rate the extent to which they agreed with the following statement.

**Table 4.12: ICT Integration in Teaching and Learning Process**

	Mean	Std. Dev
ICT helps in developing the kind of graduates and citizens required in an information society.	2.54	0.46
Integration of ICT in the teaching and learning process has improved the Management of learning.	2.31	0.32
ICT integration has helped deepen students' content knowledge, engage them in constructing their own knowledge and support the development of complex thinking skills	2.21	0.21
ICT increases student engagement, which leads to an increased amount of time students spend working outside class	1.36	0.56
Improvement in the ICT infrastructure has enabled new ways of teaching and learning	1.54	0.85
ICT integration has improved access to Management education	2.15	0.45
ICT integration has improved the relevance of education content.	2.96	0.68
ICT integration has improved the Management of education by providing curricular support in difficult subject areas	2.34	0.74
ICT will not only enhance learning environments but also prepares students for future lives and careers.	2.41	0.65
The use of ICT in higher education has resulted in a move from teacher-centered delivery and transmissive learning to student-centered learning	2.61	0.23
ICT functions as information sources that enable students to be responsible for their own learning	2.43	0.52

The students strongly agreed that ICT increases student engagement, which leads to an increased amount of time students spend working outside class and ICT infrastructure has enabled new ways of teaching and learning with means of 1.36 and 1.54 respectively. ICT integration in the education system has revolutionalized the way teaching is done across learning institutions. Studies have identified a variety of constructivist learning strategies such as students working in collaborative groups or students creating products that represent what they are learning that can change the way students interact with the content (Windschitl, 2002).

#### 4.6.2.2: Influence of Teaching and Learning Process

**Table 4.18: Teaching and Learning Process and Management of Higher Education**

	Frequency	Percentage
Very great extent	137	27
Great extent	275	55
Moderate extent	22	4
Little extent	56	11
No extent at all	10	2

Majority of the students 55% agreed that integration of ICT in the teaching and learning processes influenced the management of higher education to a great extent, 27% said to a very great extent, 25% said to no extent at all, 11% said to a little extent while only 4% said to a moderate extent.

#### 4.7 Influence of ICT Integration in Research on the Management of Higher Education

##### 4.7.1 Head of Department Views

##### 4.7.1.1 Influence of ICT Integration in Research on the Management of higher education

The respondents were asked the extent to which they agreed with the following statements on ICT Integration in Research on the Management of higher education. The responses are shown in the Table 4.20.

**Table 4.19: ICT Integration in Research and Management of Higher Education**

	Mean	Std. Dev
The adoption and use of ICTs in education have a positive impact on research	1.21	0.04
ICT integration has allowed for the creation of digital resources like digital libraries where the teachers and professionals can access research material and course material from any place at any time.	1.05	0.32
ICT integration has enhanced the level of research as a result of availability of research materials	1.98	0.65
ICT integration has facilitated the networking of researchers and sharing of scholarly material which avoids duplication of work	2.01	0.45
ICT integration has provided the necessary infrastructure for providing infrastructure to support digital libraries, virtual learning, research, collaboration and publications.	1.96	0.89

The adoption and use of ICTs in education have a positive impact on research scored a mean of 1.21. whether ICT integration has allowed for the creation of digital resources like digital libraries where the teachers and professionals can access research material and course material from any place at any time scored a mean of 1.05, whether ICT integration has enhanced the level of research as a result of availability of research materials scored a mean of 1.98, whether ICT integration has facilitated the networking of researchers and sharing of scholarly material which avoids duplication of work scored a mean of 2.01 and whether ICT integration has provided the necessary infrastructure for providing infrastructure to support digital libraries, virtual learning, research, collaboration and publications scored a mean of 1.96. ICT facilities allow the networking of academics and researchers and hence enabling access and sharing of scholarly material which increase support to the levels of research (Cholin, 2005).

#### **4.7.1.2 Extent of Influence of ICT Integration in Research**

The respondents were asked the extent to which ICT Integration in Research influenced the Management of higher education.

**Table 4.20: ICT Integration in Research and Management of Higher Education**

	Frequency	Percentage
Very great extent	50	68
Great extent	11	15
Moderate extent	7	9
Little extent	2	3
No extent at all	4	5

The head of departments that agreed ICT Integration in Research influenced the Management of higher education to a very great extent were 68% of the respondents, 15% said that it influenced to a great extent, 9% said that it influenced to a moderate extent, 3% said to a little extent and 5% to no extent at all. These findings support those of Yusuf (2005) who in his study concluded that the field of research has been affected by integration of ICT which allows access, sharing and availability of scholarly works in research.

## 4.7.2 Students Views

### 4.7.2.1 Influence of ICT Integration in Research

The students were asked the extent to which they agreed with the following statements on ICT integration in research and its influence on management of higher education.

**Table 4.21: ICT Integration in Research and Management of Higher Education**

	Mean	Std. Dev
ICT integration has undoubtedly affected learning, and research	2.15	0.12
ICT integration has allowed for the creation of digital resources like digital libraries where the students can easily access research	2.32	0.35
ICT integration has enhanced the level of research done by students due to the availability of research materials.	1.98	0.45
ICT allows the networking of academics and researchers and hence sharing of scholarly material which avoids duplication of work.	1.65	0.95
Integration of ICT in research has improved the perception and understanding of the world of the student and thus can be used to prepare the workforce for the information society and the new global economy	2.44	0.32
ICT has provided the necessary infrastructure for providing infrastructure to support digital libraries, virtual learning, research, collaboration and publications.	2.15	1.01
Through ICT integration students are more capable of using information and data from various sources, and critically assessing the Management of the learning materials and enhancing research	2.29	0.85

The students strongly agreed that ICT integration has affected learning, and research, allowed for the creation of digital resources like digital libraries where the students can easily access research and enhanced the level of research done by students due to the availability of research materials with means of 2.15, 2.32, and 1.98 respectively (Bhattacharya and Sharma 2007). The responses on whether ICT integration has enhanced the level of research done by students due to the availability of research materials and whether Integration of ICT in research has improved the perception and understanding of the world of the student and thus can be used to prepare the workforce for the information society and the new global economy scored means of 1.98 and 2.44 respectively an indication that the students strongly agreed with the statements. On whether

integration has enhanced the level of research done by students due to the availability of research materials the respondents strongly agreed with a mean of 1.98. the students also strongly agreed that ICT has provided the necessary infrastructure for providing infrastructure to support digital libraries, virtual learning, research, collaboration and publications and that Through ICT integration students are more capable of using information and data from various sources, and critically assessing the Management of the learning materials and enhancing research with means of 2.15 and 2.29 respectively. Integration of ICT has allowed for easier access to scholarly materials through online research. Cholin (2005) identified that ICT facilities allow the sharing of scholarly work as well as offering assistance and guidelines in research work. Based on learning through ICT, students are more capable of using information and data from various sources, and critically assessing the quality of the learning materials and enhancing research (Castro, Sánchez and Alemán 2011).

#### **4.7.2.2 Extent of Influence of ICT Integration in Research**

The students were asked the extent to which ICT integration in research influenced the management of higher education. The responses are shown in Table 4.23.

**Table 4.13: ICT Integration in Research and Management of Higher Education**

	Frequency	Percentage
Very great extent	302	60
Great extent	133	27
Moderate extent	38	8
Little extent	22	4
No extent at all	5	1

From the Table above 60% of the students interviewed said that integration of ICT in research influenced the management of higher education to a very great extent, 27% said to a great extent, 8% said to a moderate extent, 4% said to a little extent and 1% said to no extent at all. With the help of ICT, students can now browse through e-books, sample examination papers, previous year papers etc. and can also have an easy access to resource persons, mentors, experts,

researchers, professionals, and peers-all over the world. This flexibility has heightened the availability of resources thus enhancing learning through research (Young, 2002).

#### **4.8: Information management on the Management of higher education**

##### **4.8.1 Head of Departments Views**

##### **4.8.1.1: Influence of ICT Integration on the Management of Higher Education**

The respondents were asked the extent to which they agreed with statement in the table below on information management and management of higher education.

**Table 4.14: ICT Integration on Management of Higher Education**

	Mean	Std. Dev
ICT plays a vital role in supporting powerful, efficient management and administration in education sector	1.25	0.25
ICT integration in information management has made it easier for sharing of lesson plans and assignments through emails by the lecturers.	1.01	0.14
ICT integration in information management has allowed information to be transferred, stored, retrieved, and processed by almost all who work, study or interact with a given institution	1.25	0.65

There is need for educational administrators to have facilities that allow for them to perform their tasks effectively. From the study, the responses on whether ICT plays a vital role in supporting powerful, efficient management and administration in education sector, whether ICT integration in information management has made it easier for sharing of lesson plans and assignments through emails by the lecturers and whether ICT integration in information management has allowed information to be transferred, stored, retrieved, and processed by almost all who work, study or interact with a given institution scored means of 1.25, 1.01, and 1.25 respectively an indication that the head of departments at UON strongly agreed with the statements. These findings are consistent with those of Zainally (2008) who cited that Information and Communication technology provides several facilities and possibilities for educational administrators to do carry out their responsibilities. Caroline Salerno (2009) identified that ICT

facilities enable the administration perform tasks easier through submission of lesson plans through e-mail, creation of a class Web page by teachers, attendance to technology conferences to see what other schools are doing, what other teachers are doing to integrate technology, and what principals are doing to encourage the use of technology in their schools and classrooms and admissions through web-enabled services.

#### **4.8.1.2 Influence of ICT Integration on the Management of Higher Education**

The respondents were asked the extent to which integration of ICT in information management influenced the management of higher education.

**Table 4.15: ICT Integration on Management of Higher Education**

	Frequency	Percentage
Very great extent	52	70
Great extent	12	16
Moderate extent	5	7
Little extent	2	3
No extent at all	3	4

Majority of the head of departments 70% said that integration of ICT in information management influenced the management of higher education to a very great extent, 16% said to a great extent, 7% said to a moderate extent, 3% to a little extent and 4% to no extent at all. Information and Communication Technology (ICT) plays a vital role in supporting powerful, efficient management and administration in education sector. It is specified that technology can be used right from student administration to various resource administration in an education institution (Christiana Maki, 2008).

#### **4.8.1.3: Overall improvement of ICT infrastructure and Education Management at UON**

The respondents were asked the extent to which the overall improvement of the ICT infrastructure has affected the management of education offered at UON. The responses are shown in the Table 4.26.

**Table 4.16: Extent of Overall Improvement**

<b>Extent of Overall Improvement</b>	<b>Frequency</b>	<b>Percent</b>
Very Great extent	411.0	72
Great extent	147.0	26
No extent	16.0	3
<b>Total</b>	<b>574.0</b>	<b>100</b>

From the Table 4.26, the respondents who said to a very great extent were 72% of the Head of departments interviewed, 26% said to a great extent and 3% said to no extent at all.

## 4.8.2 Students Views

### 4.8.2.1: ICT Integration in information management and Management of higher education

The students were asked to rate the extent to which they agree with the statement below on influence of ICT integration in information management and management of higher education.

**Table 4.17: ICT Integration on the Management of Higher Education**

	Mean	Std. Dev
ICT plays a vital role in supporting powerful, efficient management and administration in education sector	2.69	0.21
ICT integration has made it easier for networking among students.	2.31	0.35
ICT integration has made it easier for students to get attention from the administration and their grievances addressed	2.12	0.64
ICT integration has made it easier for student to monitor their academic progress through students' online portals.	2.25	0.82
ICT integration has made it easier for administration processes such as registration, payment of school fees and units selection.	2.10	0.41

On whether ICT integration has made it easier for networking among students, whether it has made it easier for students to get attention from the administration and their grievances addressed and whether integration has made it easier for student to monitor their academic progress through students' online portals scored a mean of 2.31, 2.12 and 2.25 respectively. This was an indication that the respondents strongly agreed. The respondents also agreed that ICT integration has made



it easier for administration processes such as registration, payment of school fees and units selection with a mean of 2.10. The students were however indecisive as to whether ICT integration plays a vital role in supporting powerful, efficient management and administration in the education sector with a mean of 2.69. Young (2002) noted that integration of ICT in learning enables effective management of education. Caroline Salerno (2009), noted that introducing technology in education institution and administration enable easier processes in administration of learning institutions. Processes such as registration, payment of school fees and units selection have made easier through the creation of online portals for the students to register as opposed to the cumbersome manual processes.

#### **4.8.2.2: Extent of Influence of ICT Integration on the Management of Higher Education**

The students were asked the extent to which ICT integration in information management influenced the management of higher education.

**Table 4.18: ICT Integration on Management of Higher Education**

	Frequency	Percentage
Very great extent	228	46
Great extent	173	35
Moderate extent	56	11
Little extent	25	5
No extent at all	18	4

The students who said that ICT integration in information management influenced the management of higher education to a very great extent were 46%, those who said to a great extent were 35%, 11% said to a moderate extent, 5% said to a little extent and 4% said to no extent at all. According to Young (2002) ICT can be used extensively for educational administration which enhances management and provision of quality education.

## **CHAPTER FIVE SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSION AND RECOMMENDATIONS**

### **5.1 Introduction**

This chapter presents the discussion of key data findings, discussion of the findings, conclusion drawn from the findings highlighted and recommendation made there to. The conclusions and recommendations drawn were focused on addressing the purpose of this study which was to establish the influence of Information Communication and Technology on management of higher education in Kenya using a case of the University of Nairobi. The objectives of the study were to establish the influence of online teaching options on management of higher education, to determine the influence of ICT integration in teaching and learning process on the management of higher education, to assess the influence of ICT integration in research among institutions of higher learning on management of higher education and to determine the influence ICT integration in information management on management of higher education.

### **5.2 Summary of Findings**

This section presents a summary of the findings as per the research objectives and the data presented in chapter four. The summary is arranged according to research objectives and questions.

#### **5.2.1 Influence of Online Learning Options on the Management of Higher Education.**

The study established that there was a significant relationship between online learning options and management of higher education. The study established that ICT has facilitated Digital learning environment or e-learning which has revolutionized continuing education for learners of all ages. The study also revealed that integration of ICT had allowed for the creation of digital resources like digital libraries where the students, teachers and professionals can access research material and course material from any place at any time, ICT has also provided a platform for the networking of researchers and hence sharing of scholarly material. From the study, it was revealed that ICT tends to expand access to education integration and has made it easier for students to access course materials any time. The study revealed that the students were aware of

the online learning options available at UON. The study also revealed that online learning options affect the management of higher education to a great extent.

### **5.2.2 ICT Integration in Teaching and Learning Process on the Management of higher education**

From the responses the study established that ICT integration has allowed for the creation of digital resources like digital libraries where the teachers and professionals can access research material and course material from any place at any time, ICT integration has enhanced the level of research as a result of availability of research materials ICT integration has facilitated the networking of researchers and sharing of scholarly material which avoids duplication of work and ICT integration has provided the necessary infrastructure for providing infrastructure to support digital libraries, virtual learning, research, collaboration and publications. From the students responses it was evident that ICT integration has undoubtedly affected learning, and research, ICT integration has enhanced the level of research done by students due to the availability of research materials and ICT has provided the necessary infrastructure for providing infrastructure to support digital libraries, virtual learning, research, collaboration and publications.

### **5.2.3 Influence of ICT Integration in Research on the Management of higher education.**

The study revealed that the adoption and use of ICTs in education has a positive impact on research, ICT integration has allowed for the creation of digital resources like digital libraries where the teachers and professionals can access research material and course material from any place at any time and that ICT integration has enhanced the level of research as a result of availability of research materials. The study also established that ICT integration has facilitated the networking of researchers and sharing of scholarly material which avoids duplication of work and has provided the necessary infrastructure for providing infrastructure to support digital libraries, virtual learning, research, collaboration and publications. From the students responses the study established that ICT integration has undoubtedly affected learning, and research, has allowed for the creation of digital resources like digital libraries where the students can easily access research, has enhanced the level of research done by students due to the availability of

research materials, allows the networking of academics and researchers and hence sharing of scholarly material which avoids duplication of work and that Integration of ICT in research has improved the perception and understanding of the world of the student and thus can be used to prepare the workforce for the information society and the new global economy

#### **5.2.4 Information management on the Management of higher education**

The study revealed that ICT plays a vital role in supporting powerful, efficient management and administration in education sector, ICT integration in information management has made it easier for sharing of lesson plans and assignments through emails by the lecturers and ICT integration in information management has allowed information to be transferred, stored, retrieved, and processed by almost all who work, study or interact with a given institution. From the responses of the students the study established that ICT integration has made it easier for networking among students, ICT integration has made it easier for students to get attention from the administration and their grievances addressed and ICT integration has made it easier for student to monitor their academic progress through students' online portals.

### **5.3 Discussions of key findings**

This section focuses on a detailed discussion of the major findings of the study which also entails comparing the study findings to the literature.

#### **5.3.1 Influence of Online Learning Options on the Management of Higher Education.**

The study established that there was a significant relationship between online learning options and management of higher education. Fry (2001) noted a series of benchmarks for ensuring distance, collaborative and e- learning quality through integration of ICT in learning institutions. From the response ICT has facilitated Digital learning environment or e-learning which has revolutionized continuing education for learners of all ages (Bhattacharya and Sharma, 2007). The study also revealed that integration of ICT had allowed for the creation of digital resources like digital libraries where the students, teachers and professionals can access research material and course material from any place at any time, ICT has also provided a platform for the networking of researchers and hence sharing of scholarly material. From the study, it was revealed that ICT tends to expand access to education integration and has made it easier for

students to access course materials any time. According to Cholin (2005), Integration of ICT in learning allows for the networking of academics and researchers and hence allowing the access and sharing of scholarly materials any time.. The study also revealed that online learning options affect the management of higher education to a great extent.

### **5.3.2 ICT Integration in Teaching and Learning Process on the Management of higher education**

From the responses the study established that ICT integration has allowed for the creation of digital resources like digital libraries where the teachers and professionals can access research material and course material from any place at any time. This was also supported by Cholin (2005) who established that ICT infrastructure allows for the access and sharing of scholarly materials. The study also revealed that ICT integration has enhanced the level of research as a result of availability of research materials. This according to Kozma, (2005) has helped deepen the content knowledge, engage them in constructing their own knowledge, and support the development of complex thinking skills. The study also revealed that ICT integration has undoubtedly affected learning, and research, ICT integration has enhanced the level of research done by students due to the availability of research materials and ICT has provided the necessary infrastructure for providing infrastructure to support digital libraries, virtual learning, research, collaboration and publications thus increasing access to and improving the relevance and quality of education (Reeves & Jonassen, 1996)

### **5.3.3 Influence of ICT Integration in Research on the Management of higher education.**

The study revealed that the adoption and use of ICTs in education has a positive impact on research, ICT integration has allowed for the creation of digital resources like digital libraries where the teachers and professionals can access research material and course material from any place at any time (Bhattacharya and Sharma 2007). This has enhanced the level of research as a result of availability of research materials. According to Cholin (2005) ICT has enabled networking of academics and researchers and hence sharing of scholarly material which avoids duplication of work hence a key support to the levels of research. This was also supported by the respondents as the study established that ICT integration has facilitated the networking of

researchers and sharing of scholarly material which avoids duplication of work and has provided the necessary infrastructure for providing infrastructure to support digital libraries, virtual learning, research, collaboration and publications. Use of ICT in education has developed higher order skills such as collaborating across time and place and solving complex real world problems (Bottino, 2003).

#### **5.3.4 Information management on the Management of higher education**

ICT plays a significant role in management of information. According to Young (2002), ICT can be used extensively for educational administration which enhances provision of quality education. The study revealed that ICT plays a vital role in supporting powerful, efficient management and administration in education sector, ICT integration in information management has made it easier for sharing of lesson plans and assignments through emails by the lecturers and ICT integration in information management has allowed information to be transferred, stored, retrieved, and processed by almost all who work, study or interact with a given institution. Caroline Salerno (2009) cited that various ways in ICT can be used for information management. He highlighted that facilitators can submit lesson plans through e-mail, creation of a class Web page by teachers, attendance to technology conferences to see what other schools are doing, what other teachers are doing to integrate technology, and what principals are doing to encourage the use of technology in their schools and classrooms and admissions through web-enabled services. From the responses of the students the study established that ICT integration has made it easier for networking among students, ICT integration has made it easier for students to get attention from the administration and their grievances addressed and ICT integration has made it easier for student to monitor their academic progress through students' online portals. This is because according to Zainally (2008) Information and Communication technology provides several facilities and possibilities for educational administrators and students to perform their duties and assignments in a faster easier and convenient manner.

#### **5.4 Conclusions**

This study made the following conclusions

The study concludes that there is a significant relationship between online learning options and management of education in institutions of higher learning. The study also concludes that online

learning options affect the management of higher education to a great extent. The study concludes that there are online learning options available at UON.

On ICT integration in teaching and learning processes in management of higher education, the study concludes that integration of ICT in teaching and learning processes affects the management of higher education to a great extent. The integration provides a platform that makes it easier for students to access learning materials as well as for lecturers to share scholarly articles.

The study also concludes that ICT integration in research influences the management of higher education to a great extent. The study also concludes that integration of ICT in research has helped make it easier for students' access to research materials as well as easier for lecturers to supervise the students' research projects.

On integration of ICT in information management, the study concludes that it affects the management of education to a great extent. The study also concludes that the overall improvement of the ICT infrastructure in the institution has improved the management of education to a very great extent. The study also concludes that this integration has made it easier for campus processes and procedures such as registration and retrieval of academic records easier.

### **5.5 Recommendations.**

The study made the following recommendations.

From the responses there were some students who were not aware of the online learning options available at UON. The findings also revealed that the students were indecisive as to whether there was promotion of international students' enrollment through online learning options. This study therefore recommends that the institutions carries out a campaign to inform the public of the online learning options available at the institutions as well as attract the international students that will facilitate exchange learning programmes thus diversify the learning modules at UON.

The study also recommends that the management of UON addresses the issues raised by the lecturers on the short comings being faced in the ICT department. The study recommends that

the institution offers orientation training to the lecturers in the case of a new system or upgrading of the old system. The study also recommends that the institution employs more assistants in the computer lab as well as to offer assistant to the lecturers.

The study also recommends that the institution improves the ICT infrastructure with upgraded operating systems so as to ensure faster performance especially during research. The institution should also provide a modern research computer hub that will make it easier for the students to conduct their academic research.

From the responses the students were indecisive as to whether the integration of ICT in information management has enabled powerful, efficient management and administration in the institution. The study recommends that the institution revises the management and administration procedures in the institution in relation to management of students' information. The study also recommends that a survey be conducted to find out ways in which the institutions can improve those processes and procedures.

## **5.6 Recommendations for Further Research**

The purpose of this study was to establish the influence of Information Communication and Technology on management of higher education in Kenya using a case of the University of Nairobi. This study recommends that in the future a similar study be conducted across all institutions of higher education in Kenya so as to generalize the findings.

The study also recommends that in the future a study be conducted on the influence of Information Communication and Technology on management in public companies. This will be important in helping the companies how they can embrace ICT in order to manage their organizations better.



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**APPENDIX 1**  
**LETTER OF TRANSMITTAL OF DATA COLLECTION INSTRUMENTS**

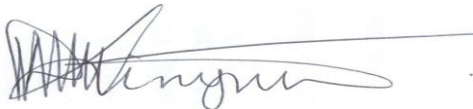
LEONARD KINYULUSI  
P.O. BOX 28225-00100  
NAIROBI.

Dear Respondent,

**RE: COLLECTION OF DATA**

I am a Masters student in the School of Distance Education, University Of Nairobi. As part of the requirement for the award of the degree, I am expected to undertake a research study on “INFLUENCE OF INFORMATION COMMUNICATION AND TECHNOLOGY ON MANAGEMENT IN HIGHER EDUCATION IN KENYA. I’m therefore seeking your assistance to fill the questionnaires attached. The attached questionnaire will take about ten minutes to complete. Kindly answer all the questions. The research results will be used for academic purposes only and will be treated with utmost confidentiality. Only summary results will be made public. No one, except the institution will have access to these records.

Should you require the summary, kindly indicate so at the end of the questionnaire. Your co-operation will be appreciated.



**LEONARD KINYULUSI**



where the students, teachers and professionals can access research material and course material from any place at any time					
ICT has provided a platform for the networking of researchers and hence sharing of scholarly material					
Development of ICT infrastructure at UON has enhanced online teaching and learning					
Through ICT, learning can occur anytime and anywhere as it has facilitated online course materials that are accessible 24 hours					
Learning and teaching no longer depends exclusively on printed materials due to multiple resources available online.					
Online teaching options have provided instructors with easier and convenient teaching possibilities					
Development of ICT infrastructure has made it easier for supervising students' proposal and research works by the supervisors.					

6. In your opinion, to what extent has online learning options influenced the Management of Higher Education at UON

Very great extent [    ]

Great extent [    ]

Moderate extent [    ]

Little extent [    ]

No extent [    ]

7. In your opinion, to what extent has online learning options made it easier for the department to manage students academic reports

Very great extent [    ]

Great extent [    ]

Moderate extent [    ]

Little extent [    ]

No extent

8. List three areas that need to be improved in the ICT department so as to enhance effective performance and delivery of the online learning options

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**Section C: ICT Integration in Teaching and Learning Process and Management of Higher Education.**

9. Below are several statements on the influence of online learning options on the Management of higher education. On a scale of 1-5 where 1= strongly agree, 2= agree, 3= neutral, 4= disagree and 5= strongly disagree, please indicate by ticking (√) the extent of your agreement with each statement.

	1	2	3	4	5
Integration of ICT in teaching acts a catalyst for rethinking of teaching practices by lecturers					
Integration of ICT in teaching and learning has enhanced and improved the Management of teaching and learning.					
ICT integration in the teaching process has created the potential for access to relevant of education					
ICT integration in the teaching process has improved the Management of education offered at UON by providing curricular support in difficult subject areas.					
Integration of ICT in teaching has enabled the lecturers monitor and log the progress of the students across time, place and varied activities					
Integration of ICT has made it possible for the instructor's transfer some of the responsibilities to the students to self manage.					
ICT integration has facilitated the evaluation and examination of the learning process and results by the administration in a flexible and convenient way.					
Learning environments become inquiry-based and problem-centered within authentic settings as a result of ICT integration.					

10. In your opinion, to what extent has ICT Integration in Teaching and Learning Process influenced the Management of Higher Education at UON

- Very great extent [     ]
- Great extent [     ]
- Moderate extent [     ]
- Little extent [     ]
- No extent [     ]

**Section D: ICT Integration in Research and Management of Higher Education.**

11. Below are several statements on the influence of online learning options on the Management of higher education. On a scale of 1-5 where 1= strongly agree, 2= agree, 3= neutral, 4= disagree and 5= strongly disagree, please indicate by ticking (√) the extent of your agreement with each statement.

	1	2	3	4	5
The adoption and use of ICTs in education have a positive impact on research					
ICT integration has allowed for the creation of digital resources like digital libraries where the teachers and professionals can access research material and course material from any place at any time.					
ICT integration has enhanced the level of research as a result of availability of research materials					
ICT integration has facilitated the networking of researchers and sharing of scholarly material which avoids duplication of work					
ICT integration has provided the necessary infrastructure for providing infrastructure to support digital libraries, virtual learning, research, collaboration and publications.					

12. To what extent has ICT Integration in research influenced the Management of Higher Education at UON

- Very great extent [    ]
- Great extent [    ]
- Moderate extent [    ]
- Little extent [    ]
- No extent [    ]



**Section D: ICT Integration and Management of Higher Education.**

13. Below are several statements on the influence of online learning options on the Management of higher education. On a scale of 1-5 where 1= strongly agree, 2= agree, 3= neutral, 4= disagree and 5= strongly disagree, please indicate by ticking (√) the extent of your agreement with each statement.

	1	2	3	4	5
ICT plays a vital role in supporting powerful, efficient management and administration in education sector					
ICT integration in information management has made it easier for sharing of lesson plans and assignments through emails by the lecturers.					
ICT integration in information management has allowed information to be transferred, stored, retrieved, and processed by almost all who work, study or interact with a given institution					

14. In your opinion, in what other ways can ICT be used in information management at UON

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15. To what extent has integration of ICT in information management affected the Management of education at UON.

- Very great extent [     ]
- Great extent [     ]
- Moderate extent [     ]
- Little extent [     ]
- No extent [     ]

16. To what extent has the overall improvement of ICT infrastructure affected the Management of education offered at UON.

- Very great extent [     ]
- Great extent [     ]
- Moderate extent [     ]
- Little extent [     ]
- No extent [     ]

**APPENDIX III  
STUDENT QUESTIONNAIRE**

**Section A: Demographic Characteristics of Respondents**

1. Indicate your gender

Male [     ]            Female        [     ]

2. What is your year of study

1<sup>st</sup> year        [     ]        2<sup>nd</sup> year        [     ]        3<sup>rd</sup> year        [     ]

4<sup>th</sup> year        [     ]        Other            [     ]

3. Indicate your department

\_\_\_\_\_

4. How often do you use the ICT facilities at UON

Daily [     ]                      Weekly        [     ]                      Monthly        [     ]

5. Please tick the reasons for using the ICT department (you can tick more than one)

Assignments [     ]            Research        [     ]                      Administrative [     ]

**Section B: Online Learning Options on the Management of Higher Education.**

6. Below are several statements on the influence of online learning options on the Management of higher education. On a scale of 1-5 where 1= strongly agree, 2= agree, 3= neutral, 4= disagree and 5= strongly disagree, please indicate by ticking (√) the extent of your agreement with each statement.

	1	2	3	4	5
ICT has facilitated Digital learning environment or e-learning which has revolutionized continuing education for learners of all ages.					
ICT has facilitated the creation of digital resources like digital libraries where the students, can access research material from any place at any time					
Online learning processes has allowed for the networking of academics through shared scholarly materials					
Online learning processes have created an online environment that facilitates					

teaching techniques across time and distance.					
ICT integration has made it easier for students to access course materials any time					
The globalization brought about by the ICT integration process has created a large market of offshore students.					
ICT tends to expand access to education					
Teleconferencing classrooms allow both learner and teacher to interact simultaneously with ease and convenience					
Due to ICT integration learning and teaching no longer depend exclusively on printed materials					
ICT integration has assisted in transforming the teaching environment into a learner-centered one					
Learners are actively involved in the learning processes in ICT classrooms					

7. Are you aware of whether there are online learning options available at UON?

Yes [     ]     No [     ]

8. List any other ways in which online learning options have influenced Management of education at UON

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9. To what extent has online learning options influenced the Management of education offered at UON.

Very great extent [     ]  
Great extent [     ]  
Moderate extent [     ]  
Little extent [     ]  
No extent [     ]

**Section C: ICT Integration in Teaching and Learning and Management of Higher Education**

10. Below are several statements on the influence of ICT integration in the teaching and learning process on the Management of higher education. On a scale of 1-5 where 1= strongly agree, 2= agree, 3= neutral, 4= disagree and 5= strongly disagree, please indicate by ticking (√) the extent of your agreement with each statement.

	1	2	3	4	5
ICT helps in developing the kind of graduates and citizens required in an information society.					
Integration of ICT in the teaching and learning process has improved the Management of learning.					
ICT integration has helped deepen students’ content knowledge, engage them in constructing their own knowledge and support the development of complex thinking skills					
ICT increases student engagement, which leads to an increased amount of time students spend working outside class					
Improvement in the ICT infrastructure has enabled new ways of teaching and learning					
ICT integration has improved access to Management education					
ICT integration has improved the relevance of education content.					
ICT integration has improved the Management of education by providing curricular support in difficult subject areas					
ICT will not only enhance learning environments but also prepares students for future lives and careers.					
The use of ICT in higher education has resulted in a move from teacher-centered delivery and transmissive learning to student-centered learning					
ICT functions as information sources that enable students to be responsible for their own learning					

11. To what extent has ICT integration in the teaching and learning processes influenced the Management of education offered at UON?

- Very great extent [     ]
- Great extent [     ]
- Moderate extent [     ]
- Little extent [     ]
- No extent [     ]

**Section D: ICT Integration in Research and Management of Higher Education.**

12. Below are several statements on the influence of ICT integration in research on the Management of higher education. On a scale of 1-5 where 1= strongly agree, 2= agree, 3= neutral, 4= disagree and 5= strongly disagree, please indicate by ticking (√) the extent of your agreement with each statement.

	1	2	3	4	5
ICT integration has undoubtedly affected learning, and research					
ICT integration has allowed for the creation of digital resources like digital libraries where the students can easily access research					
ICT integration has enhanced the level of research done by students due to the availability of research materials.					
ICT allows the networking of academics and researchers and hence sharing of scholarly material which avoids duplication of work.					
Integration of ICT in research has improved the perception and understanding of the world of the student and thus can be used to prepare the workforce for the information society and the new global economy					
ICT has provided the necessary infrastructure for providing infrastructure to support digital libraries, virtual learning, research, collaboration and publications.					
Through ICT integration students are more capable of using information and data from various sources, and critically assessing the Management of the learning materials and enhancing research					

13. To what extent has ICT integration in the teaching and learning processes influenced the Management of education offered at UON?

- Very great extent [     ]
- Great extent [     ]
- Moderate extent [     ]
- Little extent [     ]
- No extent [     ]

**Section E: ICT Integration in Information Management on the Management of higher education.**

14. Below are several statements on the influence of ICT integration in research on the Management of higher education. On a scale of 1-5 where 1= strongly agree, 2= agree, 3= neutral, 4= disagree and 5= strongly disagree, please indicate by ticking (✓) the extent of your agreement with each statement.

	1	2	3	4	5
ICT plays a vital role in supporting powerful, efficient management and administration in education sector					
ICT integration has made it easier for networking among students.					
ICT integration has made it easier for students to get attention from the administration and their grievances addressed					
ICT integration has made it easier for student to monitor their academic progress through students' online portals.					
ICT integration has made it easier for administration processes such as registration, payment of school fees and units selection.					

15. To what extent has ICT integration in information management influenced the Management of education offered at UON?

- Very great extent [     ]
- Great extent [     ]
- Moderate extent [     ]
- Little extent [     ]
- No extent [     ]

**APPENDIX IV**  
**UNIVERSITY OF NAIROBI ACADEMIC DEPARTMENTS**

1. Agricultural Economics
2. Anaesthesia Department
3. Animal Production
4. Arabic
5. Architecture and Building Science
6. Biochemistry
7. Business Administration
8. Centre for Human Rights and Peace
9. Centre for Translation and Interpretation
10. Chemistry Department
11. Civil and Construction Engineering
12. Clinical Medicine and Therapeutics
13. Clinical Studies
14. Commercial Law
15. Communication Skills and Studies
16. Confucius
17. Conservative and Prosthetic Dentistry
18. Diagnostic Imaging & Radiation Medicine
19. Distance Studies
20. Education Administration And Planning
21. Education Communication and Technology
22. Education Studies
23. Educational Foundations
24. Electrical and Information Engineering
25. Environmental and Biosystems Engineering
26. Extra Mural Studies
27. Field Station
28. Finance & Accounting
29. Food Science, Nutrition and Technology
30. French
31. Geography and Environmental Studies
32. Geology Department
33. Geospatial and Space Technology
34. German Studies
35. History and Archaeological Studies
36. Human Anatomy
37. Human Pathology
38. Kibwezi Field Station
39. Kiswahili
40. Korean Centre
41. Land Resource Management & Agricultural Technology
42. Library and Information Science
43. Linguistics & Languages

44. Literature
45. Management Science
46. Mechanical and Manufacturing Engineering
47. Medical Microbiology
48. Medical Physiology
49. Meteorology
50. Obstetrics & Gynaecology
51. Open, Distance and eLearning Centre
52. Ophthalmology
53. Oral/Maxillofacial Surgery, Oral Medicine/Pathology, Oral/Maxillofacial Radiology
54. Orthopaedic Surgery
55. Paediatric/Dentistry and Orthodontics
56. Paediatrics & Child Health
57. Periodontology/Community and Preventive Dentistry
58. Pharmaceutical Chemistry
59. Pharmaceutics and Pharmacy Practice
60. Pharmacology and Pharmacognosy
61. Philosophy and Religious Studies
62. Physical Education and Sports
63. Physics
64. Plant Science and Crop Protection
65. Political Science and Public Administration
66. Private Law
67. Psychiatry
68. Psychology
69. Public Health Pharmacology & Tox.
70. Public Law
71. Real Estate and Construction Management
72. Sociology and Social Work
73. Surgery
74. The Center for Sustainable Dryland Ecosystems and Societies
75. Urban And Regional Planning
76. Vet Farm
77. Vet. Anatomy And Physiology
78. Veterinary Pathology, Microbiology & Parasitology