THE RELATIONSHIP BETWEEN UNIVERSITY CURRICULA DEVELOPMENT AND WORKPLACE PERFORMANCE OF ICT GRADUATES: A CASE OF MAKERERE UNIVERSITY, BACHELOR OF SCIENCE IN COMPUTER SCIENCE CURRICULUM

BY

RUTH NANTEZA SSEBAGALA

12/MHEMA/01/001

A DISSERTATION SUBMITTED TO THE SCHOOL OF MANAGEMENT SCIENCE IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF A MASTER'S DEGREE IN HIGHER EDUCATION MANAGEMENT AND ADMINISTRATION AT UGANDA MANAGEMENT INSTITUTE

FEBRUARY 2019

DECLARATION

I, Ruth Nanteza Ssebagala, declare to the best of my knowledge, that this research dissertation is my original work which has never been published and/or submitted for any award in any other University/Institution of Higher Learning.

Signed:_____ Date:_____

APPROVAL

This research dissertation has been submitted for examination with our approval as academic supervisors.

Signed: ---------- Date: ----------

Dr. Proscovia Namubiru Sentamu

Supervisor

Signed: ---------- Date: ----------

Dr. Gerald Kagambirwe Karyeija

Supervisor

DEDICATION

I dedicate this research to the amazing Grace of the Lord, through which He has provided lots of support from family and friends.

ACKNOWLEDGMENTS

The journey has finally come to the end! I am so thankful for everyone who has encouraged, challenged and supported me on this journey. I want to thank each one who has been waiting for this achievement – your faith has paid off. Specifically, I want to extend special gratitude to my supervisors; Dr. Proscovia Namubiru Sentamu and Dr. Gerald Kagambirwe Karyeija, for all the guidance accorded, to have me complete this paper. Mrs. Mary K. Barifaijo, the mother of this program – you have really been a blessing. Dr. Mugurusi, you came along the way to support my endeavours and for this, I am forever indebted. The class of MHEMA (1), we came as strangers, and left as friends! Thanks for the support.

Achievement of this degree would not have been possible without family. Mr & Mrs. Ssebagala, for the moral support and believing that its possible. Mr& Mrs. Ogwang, Mr. & Mrs. Buule, Mr. & Mrs. Lubwama as well as Walusimbi Phillip, I want to say that I could never have asked for a better family. You have provided invaluable support and challenge to have me accomplish. On a special note, I wish to acknowledge my children; Amani, Rebecca, Hilbert, Asifiwe & Adia, who most felt the pain of my absence while I used their would-be time to study. This achievement is for you and to encourage others that all things are possible. May you accomplish much more than I have been able to. I also extend my sincere heartfelt gratitude to Dr. Ngubiri John at Makerere University Kampala who gave me audience during my interview sessions; as well as the employees of UVRI, UgaBUS, New Vision, Daily Monitor, Infotec, Vodafone Uganda, Huawei Technologies Uganda Limited, Explo Agency, Tv West and Anti-Corruption Coalition Uganda. You gave me most of the information that was required for the completion of this report. Thank you indeed.

Finally, my dear husband, Robert Senyonjo – I could never have accomplished this without you being comfortable and flexible to allow me take on this challenge. You let me soar to my heights without reservation.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

BSCs	Bachelor of Science in Computer Science
ICT	Information and Communications technology
KSA	Knowledge, Skills and Attitudes
NCHE	National Council for Higher Education
NDP	National Development Plan
SD	Standard Deviation

ABSTRACT

The study examines the relationship between university ICT curriculum development and workplace performance of ICT graduates of Computer Science at Makerere University. Emphasis was put on establishing the relationship between ICT curriculum planning and workplace performance; examining the relationship between ICT curriculum implementation and workplace performance, and analysing the relationship between ICT curriculum evaluation and workplace performance. The study was carried out under a mixed methods approach under the sequential exploratory research design, where quantitative data was used to compliment qualitative data. The data collection methods adopted were used to explore and obtain viable data regarding curriculum development. Data collection sources included primary data, which was based on the data collected form respondents through questionnaires and interviews, and observations which availed first-hand information. Furthermore, secondary data was generated through document reviews such as journals, books and articles, among others. Lastly, the data was presented using tables and narratives. The study revealed that there was a positive relationship between curriculum planning and workplace performance, as well as between curriculum implementation and workplace performance. The study revealed that lecturers gave course outlines, course objective and study rationales to students but there was no baseline for establishing the rationale for studying the course units. Furthermore, most of the curriculum implementation was more of theory-based knowledge rather than practical knowledge which was required to meet the demanding job market. Besides, the curriculum was more top management-oriented, leaving out contributions by students in the curriculum evaluation process. The study concludes that having the right input at the planning stage of the curriculum can produce the right output at the workplace, especially in terms of practical skills and, thus, emphasis was put on inclusion of practical exams as much as theoretical exams for students to get exposure and knowledge. However, the study was time constrained and suggests that further comparative research be done in line with experiences of ICT graduates employed more than five years ago and fresh graduates, for evaluation purposes of the ICT curriculum.

CHAPTER ONE

INTRODUCTION

Uganda is steadily driving towards the Middle-income status as a country in its vision for 2040 and the major drivers being advanced by government are, among others, ICT as stated out in the ICT sector Strategic Development Plan of the National Development Plan (2011/2015). This is emphasised in the Second National Development Plan (2015/16-2019/20). The ICT sector objectives among others are; Development of quality ICT human capital stock to meet the industry demands for ICT skills and support research and development (NDP II, 2015, page185).

In Uganda's education sector, higher education institutions have been responsive to the need and have created demand-related programs in the ICT area. The NCHE-approved programs have gone on to train hundreds of graduates, who are then released to the employment world.

The mandate and work of the NCHE is to create minimum standards for the programs (aligning them to the demand needs of the workplace) taught at universities and to regulate the functioning of these programs and universities in general. For ICT-related courses, the minimum standards were released in 2014, but the courses of ICT and accreditation of these courses was already in the pipeline. In fact, ICT graduates had been released to the world of employment. Indeed, a Tracer Studies of 2005 graduates carried out among various programs offered at universities and colleges, reveals that graduates traced in work placements fell short of the employers' expectations (NCHE 2013, p.81).

While ICT programs continue to run and produce graduates, this study was set to examine the relevance of University ICT curriculum development and workplace performance of ICT

graduates, by finding out how ICT planning, implementation and evaluation activities inform the skills needed at workplaces. This study is, therefore, useful for curriculum writers, employers, government strategic planners and the students in general who would wish to understand how curriculum designs are impactful to workplaces.

This chapter covers the background to the study, statement of the problem, purpose and objectives of the study, research questions, scope and justification of the study as well as the conceptual framework.

1.1 Background to the study

The study sought to examine the relevance of University ICT curriculum development processes and workplace performance of its graduates. This study was undertaken at Makerere University School of Computing and traced its IT graduates at various workplaces, to determine objectives/goal achievement of the curriculum against the skills set needed at workplaces.

1.1.1 Historical Background

The purpose of higher education was a question most researchers had explored, such as Chan (2016), Stockton (2004), UNESCO (1991) and Ramaley ((2014). Most these authors and scholars seemed to agree on this; that education in higher education institutions is for knowledge acquisition to impact humankind and their environment. Creation of higher education curricula in ICT was as a result of the Government recognising it as a driver of national development in all of its other sectors. This resulted in higher education institutions taking up the challenge to create programs that would transform individuals through knowledge acquisition, to meet the need that was emerging. At Makerere University, the ICT curriculum was developed in response to the Government's urge to adopt ICT for the emerging needs of development and its pivotal role in

transforming economic development. The purpose of higher education learning is performance, especially on the job and has been associated with knowledge and skills acquisition, relevant to a specific workplace. The knowledge and skills are carefully acquired, in the sense that they must be intentional. According to Katorobo (1982), one of the objectives of public education in Uganda was to increase the skills of public officers so as to increase their general abilities.

Katorobo (1982) further explains that in Uganda, the post-independence era posed a challenge to institutional managers who were receiving tools of power from the departing colonialists. The colonialists had identified a few people to train on clerical and administrative skills, so that they may be useful in implementing some of the programs for the country. With this independence, more Ugandans were faced with administrative tasks, yet with few skills. At this point, higher education was earmarked as an urgent need and thus expanded – scholarships and further trainings were secured so as to equip people with skills. Upon this background, it is worth noting, therefore, that higher education, whose need heightened in Uganda in the early 1970s, was developed with a purpose of producing skilled people who would apply these skills to the workplaces and in public service. In other words, the curriculum developed to train these individuals was meant to inculcate the beneficiaries with skills to create an impact in their workplaces.

Globally, the US department of education in 1983 published a paper, "A nation at risk", where it held learning institutions responsible for the nation's predicated slide from the zenith of the world's economy, noting that;

'while we can take justifiable pride in what our schools and colleges have historically accomplished and contributed to the United States and the well-being of its people, the education foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a nation and a people".

A second report, “What work requires of schools, SCANS-Report on workplace skills (U.S Department of Labor, 1991) issued a warning to parents:

“Parents must insist that their sons and daughters master this (workplace) know-how and that their local schools (and colleges) teach it. Unless you do, your children are unlikely to earn a decent living. It ends.

Thus the mastery of the workplace skills is a requirement that must be taught from schools attended. Besides, from the report, observation was made that mediocrity is a threat to both the welfare and education of students, with an argument that gaining of skills requires an ability for passing them on to a student, as well as the ability to decode them and appropriately apply them at the workplace.

1.1.2 Theoretical Background

The theoretical framework that guided this study was the Systems theory. General systems theory was originally proposed by biologist Ludwig von Bertalanffy in 1928. It reveals that it is a set of things that are within an environment and form a larger pattern that is different from any of the parts. The fundamental systems-interactive paradigm of organizational analysis features the continual stages of input, throughput (processing), and output, which demonstrate the concept of openness/closedness. A system is open or closed depending on whether it interacts with its environment or does not interact with its environment, respectively (Walonick, 1993).

The six underlying assumptions are: observation, cause/effect, reflexivity, self-organization, determinism and interdependence. For purposes of this research, the study dwelt on the assumption of cause / effect. This assumption is the most appropriate for this research because it describes that one sum of the part is related to its total sum. The curriculum being a component of the system, should be assessed and measured out on how it gets interpreted into the workplace.]

One common element of all systems is described by Kuhn (1974). He says that knowing one part of a system enables us to know something about another part. The *information content* of a "piece of information" is proportional to the amount of information that can be inferred from the information (Kuhn, 1974).

In the context of education, Dewey (1902) related this systems theory in one of his education treatises, titled 'The Child and the Curriculum', reprinted in 2010 by the Kessinger Publishers. He felt that the curriculum should ultimately produce students who would be able to deal effectively with the modern world. In essence, the input should undergo a process to produce an output that would deal with the modern world.

Skilbeck also developed the curriculum development process model, which has largely been referred to as Skilbeck's model. According to him, the curriculum development process starts with a situational analysis and, for this study, the individual, society, the human knowledge and skills. In other words, the motivation for why a particular curriculum should be developed should be that an individual who undergoes it ought to be an asset to the society. According to Tyler (2013), there are five sources to which curriculum developers look to for deriving objectives in education and one of these is the needs of the contemporary society. It is therefore important to find out, in this research, whether the needs of the contemporary society are being met by the ICT curricula developed at universities.

Curricula developed should be such that an individual who undergoes it ought to be an asset to the society.

1.1.3 Conceptual Background

The conceptual framework for this study is embedded in the open systems theory as described above. The concept portrays curriculum development as the input. This involves planning, implementation, assessment & evaluation. This curriculum development is an independent variable. Curriculum development as an independent variable influences the workplace performance (Sawi, 1996). Workplace performance is a dependent variable and it involves the three domains of human development, which are the affective domain, psychomotor domain and the cognitive domain (Bloom, et al, 1956). These domains are what reveal a graduate's knowledge, skills and attitudes. (KSA). These KSAs are a result of the throughput that a student would have undergone - which is the process of 'inputting' curriculum onto this individual student and as such ensure that they are 'processed' to a level that they can be an 'output', which is a function of KSA.

The system that was dealt with in the proposed study was an open system. A system is open or closed depending on whether it interacts with its environment or does not interact with its environment, respectively (Walonick, 1993:5).

Simon and Dippo (1991:5) write

" In order to understand the distinctive character of our concept of work education, it is helpful to first consider some earlier formulations of how schools could be linked to the economy".

They go on to say that,

"these formulations were attempts to provide specific directions for incorporating work-related issues into the curriculum". They also present a conflict of views "about the relationship between

education and work, embedded in a larger framework of assumptions about the role of schools in serving society". They conclude thus,

"The controlling purpose of vocational education is to produce definite forms of skills and power which shall enable the learner to become a successful producer of valuable service."

1.1.4 Contextual Background

According to the tracer study (2005) carried out by the National Council for Higher Education, revealing the various aspects of graduates in several programs ranging from medicine to arts in arts, employers emphasized that higher education institutions must give more time to practical courses. It also recommends that employers should be encouraged to set up staff development programs to improve and update the skills and knowledge of graduates.

According to the National ICT Policy of Uganda (2003), most institutions of higher learning, both private and public, offer varying levels of ICT skills training, mostly as part of their programs for formal academic qualifications. At Makerere University, the college of Computer Science provides high-level academic training in the field of Computer Science to students. Most other departments have incorporated ICT training in their curricula. However, as the ICT policy of Uganda states, "In many cases facilities are not adequate to provide the required exposure to students in order to provide them with adequate hands-on practice". It further reveals that it is impossible to judge the competence of the graduates from these institutions by [mere] looking at their certificates.

Bishop (1985:138) argues that we cannot or should not decide on 'what' to teach or how to teach until we know 'why' we are doing it. Some countries like Jamaica have chosen to first work out what their education should aim to achieve, before laying down what that education should

contain. In East Africa, Kenya has also been able to realize the importance of ascertaining goals and objectives of education first before getting down to implementing the objectives.

Most of the non-traditional programs today at higher education institutions such as entrepreneurship, human resource management, Oil & Gas studies; not mentioning ICT, are all as a result of the response to the needs of contemporary society. It is therefore logical to trace for the purpose of this study, the ICT curriculum development process to see if it 'delivers' what it promises by tracing the performance of the graduates at workplaces and how their input is as a result of the curriculum process that the graduates underwent while at the higher education institutions.

1.2 Statement of the Problem

Although employers seek skilled people to help with the advancement of a vision for an organisation and college recruitment offers an opportunity for recruiters to select the potential employees with the personal, technical and professional competencies they require in their organisations (Thatcher, n.d p16), the tracer study of 2005 graduates from five universities and four colleges, NCHE (2013) revealed that 49.5% of employers felt the relevance of the skills given at institutions fit for the job market and, for the Bachelor of computer science, only 47% of employees has relevant skills to the job. universities were producing graduates whose quality of degree qualification was questioned by employers. This claim is supported by the Uganda National ICT Policy Framework (2003, p. 23). In 2014, NCHE for the first time released the minimum standards for various ICT programs. Among these were standards for most IT-related programs but none for Computer Science.

Implementing a curriculum that is not subjected to any standard benchmarks let alone aligned to any minimum standards is likely to create a skills gap. Such a curriculum is assumed to be inconsistent with the needs of society, particularly in the area of Computer Science, which is vital in the development of quality ICT human capital stock (Strategic Plan of Education, 2004-2015,NDPII 2015/16-2019/20).

1.3 Purpose of the study

The purpose of the study was to examine university ICT curricula development and workplace performance of ICT graduates of the Bachelor of Science in Computer Science programme at Makerere University.

1.4 Objectives of the study

i. To establish the relationship between ICT curricula planning at universities and workplace performance of the ICT graduates;

ii. To examine the relationship between ICT curricula implementation at universities and workplace performance of the ICT graduates; and

iii. To analyse the relationship between ICT curricula evaluation at universities and workplace performance of ICT graduates.

1 .5 Research questions

This study will seek to answer the following four research questions:

i. What is the relationship between ICT curriculum planning at universities and workplace performance of the ICT graduates?

ii. What is the relationship between ICT curriculum implementation at universities and workplace performance of the ICT graduates?

iii. What is the relationship between ICT curriculum evaluation at universities and workplace performance of ICT graduates?

1.6 Hypotheses of the Study

H_1: There is no relationship between ICT curriculum planning at universities and workplace performance of the ICT graduates.

H_2: There is no relationship between ICT curriculum implementation at universities and workplace performance of the ICT graduates.

H_3: There is no relationship between ICT curriculum evaluation at universities and workplace performance of ICT graduates.

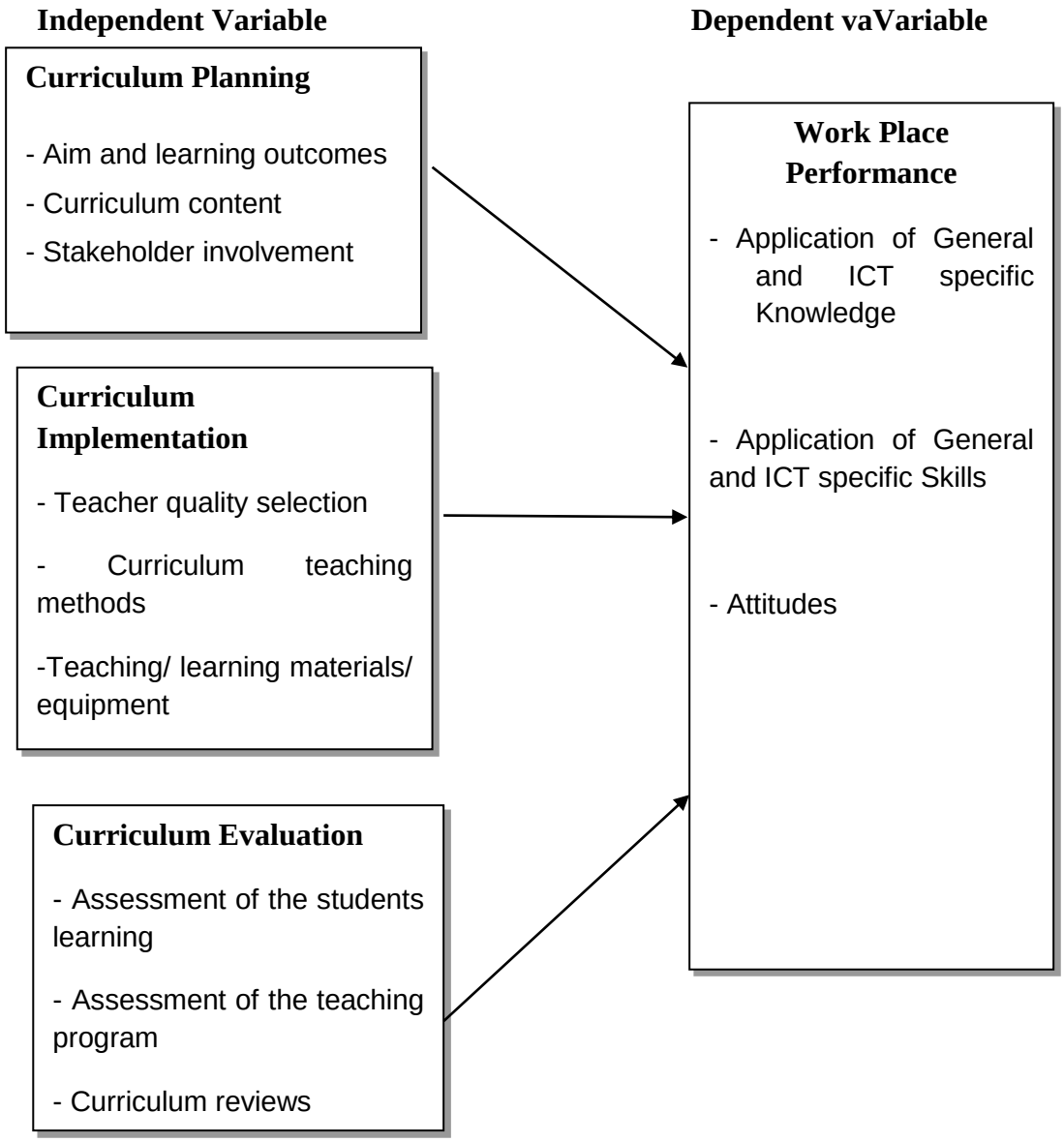
1.7 Conceptual Framework

In an era where output is measured by the inputs, the quality of input should be high if the output is to attract any value attachment to it. This assertion is the inspiration behind the conceptual framework that will be used in determining the performance of graduates as a result of the curriculum they underwent. The framework is based on the systems framework and has the following assumptions; all systems are interrelated parts constituting an ordered whole and each subsystem influences other parts of the whole. ("Wikipedia", CC BY-SA 3.0).

According to the conceptual framework, the independent variable is the Curriculum Planning. This includes curriculum design, curriculum content and curriculum implementation, which play a big role in shaping and preparing a graduate for the workplace and the workplace expectations.

About curricula planning and workplace performance of graduates, the three dimensions of curriculum development i.e., planning, implementation and development are key in shaping a student into a graduate in preparation for the workplace demands. Curriculum design is concerned with the structural framework for the curriculum. While curriculum content is concerned with the subject matter and the teaching materials; and curriculum implementation looks at the methods of teaching the curriculum that has been planned and how this teaching is evaluated (Urevbu, 1985, p.40). The dependent variable is workplace performance and this is measured by: knowledge, which is how much an employee knows about their job without further training; Skills; the art of being able to carry out their job functions efficiently; the attitudes-the response and outlook towards their job and the supporting environment for their work. The details of the variables in the conceptual framework are illustrated in Figure 1.1.

Figure 1. 1: A conceptual framework showing the relationship between curriculum development and workplace performance



Source : Adopted from Urevbu (1985) and Bloom (1956); and modified by the researcher.

1.8 Significance of the study

The study is significant in the following ways:

The study is useful as a reference material on the development of ICT curricula in consultation with the general needs of the workplaces and the development goals of the government in general. The developers and implementers of curricula are in position of finding the findings of the study useful for understanding and appreciating the objectives of a particular curriculum before applying it to a given cohort. The study also aimed at acting as a useful guide to all students undergoing curriculum studies and all other researchers in this area. It is the only study that has so far focused on the relationship between the Bachelor of Science in Computer Science curriculum implementation and the performance of graduates at workplaces in Uganda, and how their output may be reflected in the workplaces. It can, therefore, be relied on as a useful piece of literature for reference.

The study yielded data and information that is useful in harmonizing the curricula within various universities and coming up with national competence guidelines for the ICT program, especially as far as workplace performance is concerned. The study revealed the weaknesses of failure to have a national qualifications framework for the Bachelor of Science in Computer Science program and, focused on these weaknesses as a way of correcting and harmonizing curriculum planning.

The study could also result in a redirection of the general and government objectives for Bachelor of Science in Computer Science curricula and guiding how they should be implemented to advance the development goals of the country. With such a knowledge base, the implementation of ICT curricula in higher education institutions would cease to rely on wishy-washy objectives

dependent on a particular institution and redirect and re-align the objectives with those of the development needs of the country by focusing on the national qualifications frameworks. This should ensure that curriculum implementation is specific and focused on the needed competencies in the workplaces, and therefore purpose to hone these competencies into the students of various universities undergoing the given program. This study, therefore, is useful for curriculum writers, employers, government strategic planners and the students in general who would wish to understand how curriculum designs are impactful to the workplaces.

1.9 Justification of the Study

There is little evidence to show that studies have been done on relating curriculum development and how this impacts the performance of graduates at their workplaces (Ramaley, 2014; Chan, 2016; Stockton, 2004), yet these graduates are expected to display the affective, psychomotor and cognitive faculties acquired at higher education institutions in the understanding that the curriculum they underwent provides for adequate exhibition of skills, knowledge and attitudes to accomplish the workplace tasks and assignments. Furthermore, the self-trained ICT personnel sometimes even perform better than the graduates at workplaces, raising the question of the relevance of the Bachelor of Science in Computer Science program to produce competent graduates. The research shall provide information to curriculum developers and implementers of most disciplines in higher education institutions, specifically to ICT curriculum developers, on how the content therein can be made more applicable to the employers' world and how to develop the curricula that is responsive to the needs of the economy and the general society and workplaces.

Besides, this study is useful in paving a way and leading towards a national ICT policy and competence descriptor so as to streamline the role of ICT in the socio-economic development of the nation.

1.10 Scope of the Study

1.10.1 Content scope

This study focused on curricula planning, implementation and evaluation of curriculum and the impact of this on workplace performance of the graduates. Curricula development was the independent variable, while workplace performance was the dependent variable. These were measured using knowledge, skills and attitudes.

1.10.2 Geographical scope

The study was conducted at Makerere University, Kampala. This was because the focus was on curricula as written by Makerere University. This facilitated data collection about curricula development, specifically on how it is planned, ; the implementation and how it is evaluated.

1.10.3 Time scope

The study focused on the graduates of 2009 - 2018. It was expected that the eight years were long enough to capture the impact of curricula development of the Bachelor of Science in Computer Science program and the workplace performance of the graduates; while at the same time short enough to allow respondents to recall what has been happening with respect to study variables. Data collection was done in one month following the approval of research instruments by the academic supervisors.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter discusses the literature related to curriculum development and performance of graduates in general. It is divided into theoretical and main review. The theoretical review describes the theoretical orientation of the study and presents its conceptual framework. The main review discusses literature related to curriculum planning, curriculum implementation and curriculum evaluation and their effect on performance at workplaces.

2.1 Theoretical Framework

This study is modelled on the systems theory. The curriculum implementation process follows a systems model; that there is 'inputs, throughput (process) and output' (Walonick, 1993). Open systems have a dynamic relationship connected to, and interacting with their environments, which may be influenced by complex social, economic, political and technological variables. They receive inputs (including outputs from other systems) and through a series of activities convert these inputs into outputs which they then export. Such systems are also open "internally" in that interactions between components affect the system as a whole (Cole, 2004).

The process of curriculum development is an open system, as the education content to the students and the process of transformation of the student from a novice to an elite has a direct relationship with its environment, that is, the employers of the graduates who are to use the curriculum their employee would have undergone while still a student in the higher education institution. In an attempt to come up with the design of the curriculum, most institutions have

tended to portray the society as a value in the chain. They therefore ought to seek to embrace the 'emerging needs curriculum'. This is evidenced by several programs that come up as a result of the demand from the economy needs or societal needs. For purposes of this research, the emergence of an ICT curriculum was as a result of the government stressing ICT's noble role in advancing the economy. Even more so, the purpose of this research is to partly determine whether the curriculum developed because of the societal need meets the role which it presumes to address, i.e. the current ICT needs of the economy.

2.2 Workplace Performance

Walsh (2000) offers that curriculum /education is meant to serve social functions. Notably among these is the economic function, where curriculum ought to be permitted to function well by preparing the young to meet its needs in terms of both skills and attitudes. He adds that schools have to accommodate the future workers both to the productive process and to the social relations of production. He further advances that education has two further important functions a) Allocation – social mobility: to recruit and select the young to occupational and social roles, b) Innovation – the encouragement of productive invention. These social functions of education have profound effects on curriculum development. The workplace is rich ground for any curriculum to be developed, since it gives insight to the social functions and expectations of training. In a paper written to justify the inclusion of professionalism in the CIT curriculum, Little and others (1999) write that it is not enough for graduates to have technical capabilities. They must understand many aspects of IT as a discipline, they conclude. This implies,

‘(one) should be aware of the need for each computing worker to have professional responsibility for their work and an awareness of the importance of appropriate ethical behaviour in the group’. (Walsh, 2000).

ICT knowledge

According to Palvalin, Lonnqvist & Vuolle (2013), ICT knowledge presents a mechanism for easier work productivity through reducing the labour intensive means of achieving goals in an organization. This is because of ICT’s fast ability to access and distribute information as a means of achieving efficiency and effectiveness at the workplace (Malligan, 2006). Additionally, Milligan (2006) refers to this ICT use as the creation of knowledge society due to its vast social, educational and economic benefits to both individuals and organizations. Therefore, organizations are shifting to accommodate the new technological improvements such as the use of emails, teleconferences, software development and specific know-how programs as well as grid-meetings, webinars and internet discussion forums. This means that in order to achieve the intended objectives of organizations, they seek the expert knowledge of employees on the required ICT roles as required by the organization. Therefore, employees who possess such knowledge are at a greater advantage or being retained by organizations in order to extend the goals of the organizations.

Furthermore, Laihonen et al (2012) attributes he knowledge society to the acquisition of a combination of skills and knowledge which produce expertise and professionalism in specific ICT related professions thereby improving the performance of the organization. In their view, Laihonen et al (2012) argues that acquiring the right skills and knowledge is directly proportional to the curriculum used in higher education institutions, implying that the amount of specificity of

a subject including time allocated to it determine the amount of skills and knowledge acquired by a student.

ICT skills

According to Valendun and Vendramin (2005), ICT skills are directly related to work performance in that employees with the ability to accomplish ICT related tasks propel the organization's performance. This implies that ICT skills are dependent on the the position that an employee is assigned because ICT professions have expanded from the classical computer professions such as software, hardware and networks; to modern professions such as specialised business applications for instance e-commerce platforms, Entity Relation Platforms (ERP) and user-specific software development programs such as e-learning, electronic archiving among others.

However, as the ICT related professions expand, the need for possession of relevant skills is also required from prospect employees in order to meet the high demand of the workplaces. However, this implies that there must be high flexibility in the development of the curriculum used in higher education institutions.

On the other hand, whereas Valendun and Vendramin (2005) specifically list some of the required skills in the expanding ICT professions, Codefin's European Skills and Job Survey (ESJS) (2016) creates a framework for the development of the skills. Codefin (2016) suggests five skills namely, Advanced ICT skills, moderate ICT skills, Job specific ICT skills, problem solving skills and learning skills. According to their framework, these skills do not require changes in the curriculum of higher education but rather, they put strain on the organization to equip the employees with such relevant skills.

Attitudes

According to Kofi (2010), much as graduates' possession of knowledge and skill plays a great part in the determination of workplace performance, so does their perception of the computer experience because under attitudes, the graduates' behaviour at the workplace relies on their experience and beliefs to make decisions about their actions. In this reliance, some graduates develop a dislike for technology which Yalcinalp (2005) refers to a learned predisposition because the graduates have knowledge and skills emanating from their education, however, they develop a positive or negative response to technology.

It is worth noting that Fuchs and Woessman (2004) argued that whereas students' possession of ICT skills and knowledge is significant to workplace performance, the introduction of other external student environments also play a part in the determination of workplace performance especially if they are student related or organization/ workplace related.

In view of attitude and performance, Summers (1990) attributes the teachers' lack of knowledge and experience in ICT as a contribution to the negative perception towards ICT. He argues that in some higher institutions, some teachers are given subjects wherein they lack the basic required knowledge, competence, skills and experience among other factors. Such teachers cannot equip students with the required skills since they also cannot demonstrate the same.

Additionally, Liu, Maddux and Johnson (2006) also argue about the contribution of mediated time to the development of attitude towards ICT. In their argument, the scholars posit that limited amount of time offered to students while learning any ICT subject results into a poor and negative attitude towards ICT because time plays a big role in the understanding of the subjects and application of such skills in the workplace. However, Jegede, Dibu-Ojerinde and Olugbenga

(2007) view attitude and the adaptability to learning ICT as the input of the students. They argue that the curriculum offers all the required information to students but it's their responsibility to create time and learn the ICT skills. This, therefore, places the student in the position of knowledge seeking which is dependent on the student's ability to access ICT equipment as well as his or her cognitive ability to understand ICT subjects, apply the learnt skills and knowledge and develop a positive attitude towards the subjects.

2.3 Curriculum planning and workplace performance

Urevbu (1985) states that curriculum planning deals with a number of reality-oriented statements concerned with questions such as, 'what should be taught?' 'How should it be taught?', 'to what segments of the population?' and, 'what should be the relationship between the various components of the curriculum?' (p9). This therefore calls for questioning of the relevancy of curriculum, as advanced in Skilbeck's model. The ultimate purpose of the curriculum should be focused on the final consumers of the product of that curriculum, who in this regard are the employers of the ICT graduates. Bishop (1985) argues that we cannot or should not decide on 'what' to teach or 'how' to teach until we know 'why' we are doing it, (p138).

The current ICT program, however, does not seem to answer the "why" when the employers are questioning the skills set of the ICT graduates, according to the Tracer Study carried out by NCHE of 2005 graduates. (NCHE, 2013:81). For the purposes of this research, the question is answered in the form of seeking clarity on the relevancy of the ICT curriculum at workplaces. The 'why' should be revealed in the organization of the curriculum content guided by the 'what' is included in the curriculum design of ICT. This 'what' question is a critical matter. According to Bringle and Hatcher (1996), 'Universities cannot afford to remain shores of affluence, self-

importance and horticultural beauty at the edge of island seas of squalor, violence, despair, and service gap in workplaces' (p221). The relationship, therefore, with curriculum planning and performance at workplaces, is not far-fetched; in fact, the two are as complementary as the society needs change overtime. In the context of this research, Voogt and Pelgrum (2005) clearly drive the point home by stating that 'the change towards the information society implies that many countries have to change their curricula, because students need to develop competencies that are not addressed in the traditional curricula' (Voogt and Pelgrum 2005; p1).

According to Taba (1962), the term curriculum construction was traditionally employed to refer to all the processes involved in the making of the curriculum. It appears as a synonym for curriculum engineering. Curriculum construction or 'scientific curriculum making', has been a dominant ideology in the curriculum field since at least the time of Franklin Bobbit and Werren W. Charters, who emphasized that learning objectives should be on social needs. Bobbit and Charters used a technique known as activity analysis and this involved the analysis of man's activities into particular and specialized units of behaviour (Urevbu, 1985). This is the general idea which underlies the 'behavioural objectives' orientation in most curriculum texts.

Urevbu (1985) continues to note that the task of the curriculum constructor was to identify and create those 'experiences' that prepared a student to perform these activities. He also continues to note that using the metaphor of production, students became raw materials which the schools, like factories, were to fashion into finished products according to the specifications of society. Bobbit (1924) writes that "Education is for adult life, not for child life" (as cited in Smith, Stanley & Shores, 1957). This therefore relates that it is important to check relevancy of curriculum into workplaces, since that is what it is formed for. Curriculum design is concerned with the problem of making a choice of what should be the organizational basis or structural framework of the

curriculum. These frameworks may take the form of subject-centred curriculum, teacher-centred curriculum or an integrated curriculum.

Other prominent forms of designs have been called the ‘core curriculum’ and the ‘emerging needs curriculum’ (Urevbu,1985). He further argues that design attempts to project a pattern of curriculum organization as desirable. The choice of design implies a value position (p,11). That is to say, where the value lies in application of curriculum content is where emphasis should be in adopting the design to take.

Most of the proposals for the change in the curriculum have been towards an outcome-based curriculum. Kouwenhoven (2007) in his paper, “Competence-based curriculum development in higher education (African experiences)”, writes that the concept of competence-based or competency-based education (CBE) and training is interpreted in many ways in education systems all over the world, resulting at one end of a continuum in a tick list of skills and at the other in a set of generic abilities that transcend disciplinary knowledge and skills (p 124).

2.4 Curriculum implementation and workplace performance

While literature on curriculum planning informs of the need for writers to have the curriculum end-user in mind, there is considerable interest in curriculum implementation as well. Implementation involves (a) faculty preparedness for the implementation; (b) student engagement with content presented via the new curriculum model; and (c) student attainment of competencies and skills at the end of the implementation period (Vallejos, Morel &Tusing, 2017). Henard and Roseveare (2012) state that quality teaching in higher education matters for student learning outcomes. But fostering quality teaching presents higher education institutions with a range of

challenges at a time when the higher education sector is coming under pressure from many directions.

Institutions, therefore, need to ensure that the education they offer meets the expectations of students and the requirements of employers, both today and for the future. (Henard and Roseveare, 2012; p1). They add that quality teaching is the use of pedagogical techniques to produce learning outcomes for students. It involves several dimensions, including the effective design of curriculum and course content, a variety of learning contexts (including guided independent study, project-based learning, collaborative learning, experimentation, etc.), soliciting and using feedback, and effective assessment of learning outcomes. It also involves well-adapted learning environments and student support services (Henard and Roseveare, 2012; p8). Student support services in this context may include teacher engagements, teaching equipment, challenging tasks and project-based assignments to solve day to day issues.

According to Fitzgerald et al (2012), the engaged university is one that produces research of significance that benefits the society and educates students for productive roles in a modern and diverse world. These goals are achieved by maintaining high standards for scholarship and through expanded collaboration and partnership with entities and organizations outside the academy. Our current knowledge-based society demands that new information be quickly incorporated into daily practices, leading to a better and more equitable society. For universities, this involves preparing students by linking the skills developed through a major's curriculum directly to their application in the labour market.

Also, the Uganda ICT Policy (2003) recommends that, "there is need to assess the national requirement for ICT skills, establish how much of this is available, and then determine the best

strategy of meeting the appropriate ICT skills requirements" (p. 21). This is a clear indication that for the workplace to show performance, especially ICT workplaces, there is need to look into the ICT curriculum implementation and how relevant it is. Kouwenhoven (2007) continues to assert that "particularly in developing countries, graduates need to be prepared for the world of work so they can function in a range of professions", and he concludes that the experiences in three African countries show that it is possible to develop and implement competence-based curricula in a higher education context, (p, 143). Therefore, it is imperative to find out if ICT curriculum implementation prepares fully a graduate for the world of work, for which one may be preparing.

2.5 Curriculum evaluation

Bharvad (2010) describes curriculum evaluation as the process of monitoring and reporting on the quality of education. He also states that it is much wider than measurement. It is more fundamentally concerned with deciding on the value or worth wholeness of a learning process as well as the effectiveness with which it is being carried out. Curriculum evaluation refers to the process of studying the merit or worth of some aspect, or the whole of a curriculum. In the context of ICT curriculum, it is important to study the worthiness of the BSCs. Evaluation of any program is important if it is to be trusted as a means of equipping learners with the best skills for a given task or outcome. Today, employers decry the ability of the curriculum to accord the graduates the needed skills.

Boud and Falchikor (2007) give an insight into this problem by observing the following;

"In conceptualising assessment for future learning, it is necessary to take account of the context of assignment in higher education. Assessment is a value-laden activity surrounded by debates about academic standards, preparing students for employment, measuring quality and providing incentives. (p10)."

The editors further cite Steiner Kvale, a contributing writer who notes thus:

> *..there are many contradictions in assessment in higher education today not only have higher education institutions lost touch with effective assessment practices...they have ignored a considerable body of work from the psychology of learning over the past 50 years. The editors ar.gue that; - higher education institutions need to look to their social purposes to give sufficient value to assessment for life-wide and lifelong learning in a knowledge society. (p11).*

To sum it up, Rodriguez and others (2010) note that more than 20 years after ICTs were introduced in schools, solid evidence of their impact on student attainment is still lacking. Reasons for this include the mismatch between the methods used to measure the effects and the type of learning promoted, the absence of information regarding the specific types of ICT used, and the scarce attention paid to the monitoring and evaluation of ICT for Education. (p166).

2.6 Summary of Literature Review

The underlying assumption of the ICT curriculum is the translation of theoretical knowledge into practical application of knowledge, skills and development of positive attitude in the ICT related professions thus improving workplace performance. This implies that the acquisition of such skills and knowledge is centred around the development of the higher education curriculum. However, the quality of ICT professionals is questionable despite the fact that majority have ICT education certificates but cannot translate the skills and knowledge from the theoretical to the practical. This raises a debate between employers and lecturers about the quality of graduates at the workplace.

Employees argue that the ICT curriculum doesn’t prepare qualified graduates to meet the ever expanding ICT professions. However, lecturers argue that the curriculum higher prepares the graduates for employability in ICT professions. This also raises questions about the content of the curriculum as well as its development process because some scholars claim that it is theory based,

whereas others claim that is is abstract and thus requires a lot of input from the students to master the ever changing and expanding demands of ICT at the workplace.

Considering curriculum planning, literature assumes that what is taught meets workplace demands. However, it advances basing on the fact that the demands of the workplace are constant from the time of planning even when graduates begin applying skills at the workplace. This means that the conditions for the workplace are constant and thus fit into the planning phase. However, the needs of the workplace are always changing and expanding. In this case, it involves stakeholders during the process of planning of the curriculum but doesn't elaborately indicate the criterial of planning during curriculum development.

Curriculum implementation, on the other hand, assumes the transformation of a graduate into a skilled and knowledgeable professional. This implies that the acquisition of skills and knowledge is a determinant of professionalism. However, this element ignores the attitude of the student/ graduate towards workplace performance as well as the time allocated to practicing the theoretical knowledge and turning it into practical knowledge that meets the demands of the workplace. Additionally, curriculum implementation assumes that a graduate is perfectly equipped with skills and doesn't need extra training from any other institution. However, this is not always the case as literature shows that there an imbalance between employees' expectations of graduates and lecturers' impartation of knowledge onto students.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter presents a review of the research methods and design appropriateness, besides discussing the population and sample configuration. The chapter also explicates the methods that were used in the gathering of the data and the various stages the research went through to acquire the information. Likewise, it is in this chapter that the researcher particularizes the area of study, sample size determination, methods of data collection, measurement of variables and ethical considerations.

3.1 Research Design

Sekeran (2009) defines research design as a scheme, outline or plan that is used to generate answers to a research problem. Sekeran also defines it as the master plan specifying the methods and procedures for collecting and analysing the needed information.

The study adopted an instrumental case study design under the mixed methods research method with a sequential exploratory approach. The instrumental case study design was adopted because it allows the researcher to collect in-depth information beyond what she had originally prepared to accomplish as the study raises awareness about the phenomenon under study. Furthermore, the design was chosen because the case under study can be used to represent and understand other cases with the same phenomenon.

Furthermore, the research approach used was a two phase design where the qualitative data was collected first, followed by collection and analysis of quantitative data. This means that quantitative data was used to supplement the qualitative data. Therefore, the priority is given to the qualitative aspect of the study (Croswell, 2003). The purpose of choosing this design is that it enables the researcher to explore a phenomenon in terms of determining the distribution of the phenomenon within a chosen population (Morse, 1991).

3.2 Study Population

The study covered BSCc. graduates situated in various workplaces that use ICT personnel. According to the tracer study report of NCHE (2006), there are over 200 workplaces that utilise ICT personnel who have graduated from universities. This represents the target population from which representative ICT personnel was drawn. The study population consisted of workplaces where ICT graduates are employed, , and Makerere University. Workplaces of ICT graduates who went through Makerere University were selected. The study was conducted in one Research University and at least six Offices where Makerere ICT graduates are working. Information from the NCHE and the Ministry of ICT was used to triangulate the study. (NCHE, 2006)

3.4 Sample size and selection

Sekaran (2009) defines a sample as a subset of the population and adds that it comprises some members selected from the population. Amin (2005) defines it as a segment of the population selected for investigation.

The researcher obtained a sample from the target variables as a basis to estimate the parameters. The average population of graduates was determined using graduation lists (CIS MAK, 2010-2014). These were ICT graduates with at least experience of six months in their places of work.

Selection of the primary respondents was done by use of Sloven's Formula of Sampling. This formula enabled the researcher to ascertain the number of anticipated respondents who participated in the study as detailed in Table 3.1.

Sloven's formula gives n = $\frac{N}{1+Ne^2}$ where 'n' is the expected sample size
'N' is the total population
'e' is the error tolerance

Table 3. 1: Population and Sample selection

Category	Population	Sample size	Sampling procedure
ICT graduates and ICT students	950	281	Simple Random Sampling
Employers directly supervising ICT graduates	10	10	Purposive Sampling
ICT curriculum writers at universities	6	6	Purposive Sampling
NCHE staff concerned with accrediting ICT curriculum	2	2	Purposive Sampling
Government person regulating policy on ICT implementation	1	1	Purposive Sampling
Total	**969**	**300**	

3.5 Sampling Techniques and Procedures

The study used two sampling techniques, namely random sampling technique and purposive sampling. The simple random sampling method was used to select primary respondents where each respondent had an equal opportunity of being included in the sample, and the probability of a respondent being selected is not affected by the selection of another respondent. The researcher used this sampling method when selecting ICT students and the ICT graduate workforce. The average population of graduates was determined using graduation lists (CIS MAK, 2010-2014).

Furthermore, purposive sampling, a non-probability sampling method, was used to collect expert knowledge from experienced personnel in the relevant field under investigation. This sampling method was used when collecting data from secondary respondents, especially curriculum writers at university, curriculum accrediting team - National Council of Higher Education (NCHE) personnel, employers of the IT graduates and government officials.

3.6 Data collection methods

Data was collected from both primary and secondary sources (Amin, 2005). Being a mixed methods study, the researcher used both qualitative and quantitative data collection methods to collect primary data and secondary data respectively.

Primary data was collected using both the quantitative and the qualitative data. The quantitative data collection method was majorly the questionnaire method. On the other hand, qualitative methods used included interviews and observations. Secondary data was obtained from reviews of documents such as journal articles, curriculum, academic theses, and working papers, among others (Frechtling, 2002).

3.6.1 Questionnaire method

According to Creswell (2014), a questionnaire is a set of questions to be answered by the subject of a study. The researcher developed the questionnaire, which contained background information of the respondents as well as questions which are identical to the objectives of the study. The questionnaires were designed specifically to be completed by the employees of various organizations without intervention of the researcher. The questionnaires were answered by ICT graduate employees from UVRI, UgaBUS, New Vision, Daily Monitor, Infotec, Vodafone

Uganda, Huawei Technologies Uganda Limited, Explo Agency, Tv West, Uganda Telecom and Anti-Corruption Coalition Uganda.

3.6.2 Interview

An interview is a one-on-one conversation where information is passed on from an interviewee to an interviewer regarding a particular subject (Vogt, 2007). An interview guide is a set of questions that the researcher asks during the interview (Vogt, 2007).

The researcher designed an interview guide that was used during the interview of the key informants. The interview guides were structured with specific sets of questions, while others were unstructured, with just general themes to start the interview on the study variables. For good capture of data, all the interviews were recorded. This method is very important because detailed data was collected through probing.

3.6.3 Documentary review

The researcher read through and analysed documents related to the problem. These were accessed from responsible government bodies, university curriculum-related documents, policies on the implementation of ICT and, hopefully, training manuals of workplaces acquired from the human resources department and any other information that was deemed relevant to the study.

3.6.4 Observation

The researcher also observed equipment and materials that are used in teaching labs at Makerere University to determine their relevance to the curriculum that is developed to train the graduates for competence at their workplaces. These equipment and materials studied were computers, programs on the computers and teaching/ learning process.

3.7 Data collection tools

3.7.1 Interview guide

According to Lisa (2008), interview guides summarize the content that researchers cover during interviews. At one extreme, they may provide very minimal directions, leading to "less structured" interviews that are designed primarily to explore the participant's own perspective on the research topic.

There were four sets of interviews designed for the following categories of respondents: Curriculum writers, Curriculum accrediting team (NCHE), employers of ICT graduates and employees that have undergone the BSCs. and are employed, and the government regulatory body. These interview guides were structured for the employees and employers, while the curriculum writers and NCHE personnel, as well as government regulatory personnel, they were unstructured (Appendix I)

3.7.2 Documentary checklist

The documentary checklist was used to verify that specific lines of action were taken during data collection and analysis (Lisa, 2008). The researcher used a more structured documentary checklist to understand how the documents directly affect the direction of the study findings. The structured checklist was used because it is exhaustive in nature through providing all details to the findings of a study (Lisa, 2008).

The primary field-based documents that were reviewed include but are not limited to the ICT policy of Uganda, minimum standards for ICT-related courses, the BSCs Curriculum and course outlines, among others. In these documents, the researcher sought the government's stand on ICT and how it relates to workplace development. In the minimum standards, the researcher

determined what the standards are and how these compare to the developed curriculum. The researcher also sought information on why the BSCs program is not among the courses that were assigned minimum standards at NCHE. In the curriculum and the course outlines, the researcher sought content related to the employers' expectations of a curriculum and further seek to look out for the implementation by observing materials and teaching equipment. This was not limited but included any other relevant sources as come across from time to time (Appendix II).

3.7.3Observation Guide

The observation checklist was prepared prior to data collection and it was used to delineate the behaviour and situation features to be observed and recorded during observation. The observation checklist acted as a flexible guide for data collection, listing topics of interest and providing space to record notes from what was observed (Tavakol, 2012).

The researcher also used uncontrolled observation at the implementation stage (Rajendar, 2008), which was observing the actual teaching and learning of the BSCs program in real time for at least four lessons, one of which was practical. The purpose was to compare the course outlines and objectives with what is taught. The equipment used in preparing graduates was also observed as well as the students' grasp of the content. This grasp of content was observed through circulating a brief formative exit slip and carrying out brief interviews from a random sample of the students that have attended class at the time (Appendix III).

3.8 Data Quality Control

All methods complemented one another. Data collection instruments were discussed with research supervisors and approved. They were also tested and re-tested for accuracy. They were administered to research respondents at personal level for individual independent opinion.

3.8.1 Validity

Validity of an instrument refers to the appropriateness of the instrument to measure what it intends to measure (Amin, 2005). To ensure validity, the selected sources of data were pre-determined and screened to ensure that only the right respondents gave the required information. This information required that one discloses their occupation and year of service and, where appropriate, authorisation for identification and signatures. Documents to be checked were requested for in writing and sources cited for reference. Experts in the field of curriculum, including the academic supervisor, were consulted to review the tool items to ensure its consistency with the study objectives and the literature review.

A pilot study / pre-test was carried out to validate the questionnaires. Firstly, the questionnaires were reviewed by experts in the education field, who understood the topic under study. They also checked for common errors such as confusing, barrelled, and leading questions. Field data on the pilot study was entered in the Statistical Package for Social Scientists (SPSS) to test for validity using the Cronbach's Alpha method, which gave the researcher a value of 0.772 and thus a valid questionnaire.

3.8.2 Reliability

Reliability is defined by Vogt (2007) as the consistency of either measurement or design to give the same conclusions if used at different times. The first step in ensuring reliability was by providing clear operational definitions of the variables under study. Thereafter, internal consistency was measured through internal consistency reliability (Sekeran, 2009) as well as split-half reliability using Cronbach's alpha.

If the α (Cronbach alpha) value is computed to be 0.7 and above, then the instrument is considered satisfactory (Cronbach, 1951 as cited by Sekeran & Bougie, 2010), using results from the pretested questionnaire. According to Zaiontz (2015), Cronbach's alpha α can be computed by Excel's ANOVA: Two factor without replication data analysis tool and computing;

$$\alpha = \frac{MS\varepsilon}{MS\beta}$$

Where $MS\varepsilon$ is Mean square of Error, while $MS\beta$ is Mean square of Rows.

Table 3. 2: ANOVA: Two factor without Replication

	ANOVA						
	Source of Varia	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
	Rows	7.16	19	0.376842	0.564446	0.919785	1.725029
	Columns	79.26	4	19.815	29.67954	7.19E-15	2.492049
	Error	50.74	76	0.667632			
	Total	137.16	99				

Source: Excel results

From figure 3.1, α = 1- (0.667632/0.376842) = 0.772. therefore, since α> 0.7, the instrument used was considered reliable.

3.9 Procedure of Data collection

The researcher obtained an introduction letter from Uganda Management Institute. ICT curriculum writers, two NCHE staff and one ICT regulatory government agency (Ministry of ICT) were called by phone to schedule interviews and questionnaire distribution, which they accepted. All these people were practitioners of ICT programs. Since this data was mostly

collected from interviews, the researcher carried out interviews personally and where interviewers are delegate to, training was made for the interviewers to ensure the survey is under quality control (Kothari, 2004:18). After the data was collected, it was analysed and interpreted.

3.10 Data Analysis

The researcher performed both quantitative and qualitative data analysis. It involved drawing inductive inferences from data and distinguishing the phenomenon of interest from the statistical fluctuations present in the data as proposed by Amin (2005).

3.10.1 Qualitative Data analysis

Data analysis of the qualitative data was transcribed ranging from the audio interview and field notes which were typed in the computer using MsWord. The transcription was done as whole transcription to enable the researcher capture all information that was recorded during the interviews.

Data from key informants was analysed thematically, which involved condensing individual responses into similar themes and integrating them into interview schedules for easy analysis. Standing out responses from respondents' statements, comments or remarks were reported 'as is'. The use of the qualitative design was aimed at giving deeper insights of the issues that were uncovered by the study. Data collected was categorized according to emerging variables from each question in the interview guide and discussions (Smeeton, 2003).

3.10.2 Quantitative Data analysis

Quantitative data analysis focused on the examination of numerical values aggregated from the study about which descriptions such as the mean and standard deviations were made. Data

collected was checked to ensure accuracy; this was useful in ensuring that the objectives of the study were being addressed (Sekeran, 2009). Analysis was done according to the objectives of the study. Descriptive statistical analysis was found to be an ideal analysis technique and subsequently used in ascertaining the relationship between curriculum planning and workplace performance. This is because the analysis allows measurement and description of the relationship between two variables (Amin, 2005). Aided by the tabulation of data extracted from close-ended questions surveyed, it was easier to understand the issues identified by the respondents. Likewise, to help answer the questions on the relationship between curriculum development and workplace performance, regression analysis was done and the Pearson's correlation coefficient was computed using the SPSS programme to measure the direction, strength and significance of the relationship between the two variables.

3.11 Ethical Considerations

Ethics in research studies are emphasized because they involve interaction with people or sensitive documents, hence it is important to mind proper conduct during these interactions (Macmillan & Schumacher, 2010). To this end therefore, the researcher sought permission to interview respondents and also access relevant documents by presenting an introductory letter from Uganda Management Institute (UMI). Informed consent was sought from respondents prior to involving them in the study. The researcher explained that the study was for academic purposes only and the respondents were assured that the study would not cause any danger directly or indirectly and that their participation was voluntary.

Confidentiality was ensured during data collection by safely keeping the information obtained from the respondents away from people who are not part of the study. Respondents were asked

not to reveal their names in the research instruments administered to them for purposes of observing anonymity. Effort was also made to report direct or quoted qualitative findings without revealing the names of the respondents. However, the researcher also sought consent from some key informants if they wanted their names to appear in this study for evidence about the problem being researched. All data gathered from various respondents in the study were treated with maximum confidentiality.

3.12 Study limitations and delimitations

Firstly, the researcher did not have enough time to collect the required information because some respondents were quite busy with their daily work schedules. At times, they were tired from their daily work and answering the questionnaires seemed like a burden to them as some filled the questionnaires hurriedly to get the activity done, while others did not complete filling the questionnaires. Furthermore, the researcher also had other duties at her workplace which meant that she could not spend most of her day time in the field collecting data. However, the researcher requested some research assistants to help her collect data from the field. Furthermore, the researcher also exercised patience and established good rapport with the respondents in order to get more information from them and collected as much information as she could from the respondents.

Furthermore, the researcher rescheduled many appointments especially with the key informant. For instance, after making the first appointment, the researcher arrived at the agreed location (Makerere University Kampala) but the key informant was occupied by other assignments by his superiors and thus the need to reschedule the appointment, thus losing time and finances spent on transportation. The first appointment was rescheduled thrice before meeting with the key

informant. However, not all information was shared at the first meeting, which thus necessitated other appointments and still the same problem of rescheduling appointments persisted. In this case still, the researcher persisted in making appointments through telephone to remind the key informant a day before the schedule day so to know whether or not the appointments were to be met.

Some respondents were not willing to corporate especially the graduate employees in various organizations. Some graduates were so busy at their workplaces and so they requested that the researcher leaves them with the questionnaires. However, most of the questionnaires were not filled. On the appointed days of collecting the questionnaires, some respondents started filling them whereas other had forgotten about them. Some respondents, especially those who had misplaced the questionnaires requested for more questionnaires so that they can fill them at their own convenient time. The researcher did not agree to these claims and did not leave any more questionnaires with these respondents since she did not have them with her and she was limited on funds to reprint other questionnaires. Additionally, the researcher politely queried some supervisors to task some respondents to fill in the questionnaires before closure of business hours and hand them over to the researcher at 5:00 p.m on the appointed days of collection.

There was also limited funding especially in terms of printing questionnaires, transportation as well as meeting other needs. The limited funds were realized especially from respondents who requested the researcher to reprint questionnaires for them because they misplaced the first ones. Furthermore, the researcher faced some transportation funding limitations because some organizations which had Makerere ICT graduates were distant from Kampala town for instance employees in Uganda Virus Research Institute located in Entebbe 44 km from Kampala. However, in order to meet these transportation costs, the researcher had earlier on saved some

money to cater for the data collection process. However, much as the money was not enough, she got financial assistance from her family members especially her husband who provided some money to facilitate telephone needs such as airtime to call the key informants and organizations to remind them about the appointed days of meetings and collecting the data collection instruments. Furthermore, her husband provided her with a vehicle and drove her to the distant organizations to collect data.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETATION OF RESULTS

4.0 Introduction

In this chapter, the researcher presents, analyses and interprets the results according to the objectives of the study; which were: to establish the relationship between ICT curriculum planning at universities and workplace performance of the ICT graduates; to examine the relationship between ICT curriculum implementation at universities and workplace performance of ICT graduates, and to analyse the relationship between ICT curriculum evaluation at universities and workplace performance of ICT graduates.

4.1 Response Rates of respondents

A response rate is the percentage of people who respond to the survey. A low response rate can give rise to sampling bias if the non-response is unequal among the participants regarding exposure and / or outcome. Therefore, a response rate of above 50% is considered acceptable (Survey monkey, 2015). In this study, the sample size was 281 ICT graduates and students, 10 employers, six ICT curriculum writers, two NCHE staff, one government official as presented in table 4.1.

Table 4. 1: Response rate of respondents

Category	Sample size	Actual responses	Percentage (%)
ICT graduates and ICT students	281	261	92.9
Employers in ICT firms	10	10	100
ICT curriculum writers	6	2	33.3
NCHE staff	2	1	50
Government official	1	0	0
Total	**300**	**268**	**89.3**

Source: Primary data (2018)

Consistent with table 4.1, the researcher administered 281 questionnaires. A total of 261 were returned fully completed, giving rise to a response rate of 92.9%. The researcher also managed to schedule interviews with the targeted sample of 10 ICT employers who were available for the study. However, the researcher had targeted interviewing six ICT curriculum writers, two NCHE staff and one government official; but she managed to interview four employers, two ICT curriculum writers and one NCHE staff.

4.1 Demographic characteristics of respondents

The demographic information collected from the respondents included the year of service, name of workplace, job employed for and year of graduation as presented in table 4.2.

Table 4. 2: Demographic characteristics of respondents

Features	Category (code)	Frequency	Percentage (%)
Time of employment	Less than a year ago	78	29.9
	1 to 3 years ago	138	52.9
	3 to 5 years ago	32	12.2
	More than 5 years ago	13	5.0
Type of ICT employment	Systems Analyst	29	11.1
	Computer Sales person	162	62.1
	Network engineer	13	5.0
	Software Developer	5	1.9
	Others	52	19.9
Year of Graduation	2017 – 2018	86	33.0
	2014 – 2016	138	52.9
	2010 – 2013	31	11.9
	2009 and below	6	2.2
Place of work	Uganda Telecom	50	19.2
	Huawei Technologies (U) Ltd	37	14.2
	PC World	8	3.1
	Vodafone	52	19.9
	Others	114	43.6

Source: Primary data (2018)

From table 4.2, majority of the respondents (52.9%) were employed between one to three years. These were followed by 29.9% respondents who were employed for less than a year ago. 12.2% were employed between three to five years; and 5% had been employed for more than five years. From this analysis a conclusion can be made that majority of the Computer Science graduates still had a fresh memory of the theoretical and practical lessons they had studied in class; thus implying that they were feasible for the study.

Furthermore, considering the fact that they were employed in ICT companies, the researcher sought to establish the types of ICT-related jobs that they carried out. Table 4.2 shows that the majority (62.1%) were computer sales persons; these were followed by

19.9% who worked in other ICT-related jobs. Furthermore, 11.1% were systems analysts; 5% were network engineers while the remaining 1.9% were software developers. On further inquiry, 19.9% respondents reported that they worked as systems support staff, ICT technicians and programmers. A conclusion can be made that the study incorporated graduates from various fields of Computer Science and thus had no bias.

The researcher inquired about the year of graduation in order to establish whether the respondents still had a fresh memory about what they studied in class compared to what they were doing in the field. Table 4.2 revealed that 52.9% of the respondents graduated between 2014 and 2016; 33% graduated between 2017 and 2018; 11.9% graduated between 2010 and 2013, while the remaining 2.2% graduated in 2009 and below. The study shows that majority of the respondents in these workplaces and with these ICT-related jobs graduated between 2014 and 2018, implying that they still had a fresh memory about the class work they did and they could make comparisons with the work in the field where they were employed.

Considering the employees' places of work, table 4.2 revealed that majority of graduates (43.6%) were employed in other workplaces where ICT graduates are required. About 19.9% were employed in Vodafone Uganda; 19.2% were employed in Uganda Telecom; 14.2% were employed in Huawei Technologies Uganda Limited; while the remaining 3.1% were employed in PC World. The researcher established the workplaces which the majority 43.6% worked and, they reported that they worked in Explo Agency, New Vision, Monitor Publications, Uganda Virus Research Institute, TV West, Anti-Corruption Coalition Uganda, and UgaBus.

4.2 Empirical presentation and analysis of findings

In this section, the researcher used primary data to test and compute frequencies, relationships and hypotheses. Primary data was owing to the fact that they best represented the perceptions of respondents on ICT curriculum development and workplace performance of ICT graduates. Respondents were therefore required to assign a discrete value to a preferred level of agreement.

Furthermore, this section provides the descriptive statistics before computing inferential statistics. The descriptive statistics were used to measure central tendencies (mean, standard deviation, frequencies and percentages). The inferential statistics were used to measure the level at which one variable was affected by another. This was done using regression models and correlations as presented below:

4.2.1 The Relationship between ICT Curriculum Planning and Workplace Performance of ICT Graduates

The researcher probed respondents on the relationship between ICT curriculum planning and the workplace performance of ICT graduates. In this section, the researcher used primary data sources, implying that primary data was used in the testing of relationships, hypotheses and frequencies in relation to ICT curriculum planning and workplace performance as presented in table 4.3.

Table 4. 3: Frequencies for ICT curriculum planning

Category	Strongly Agree		Agree		Disagree		Strongly Disagree		Mean	SD
	Freq	%	Freq	%	Freq	%	Freq	%		
We were given course outlines at the beginning of each learning module	146	55.9	104	39.8	11	4.3	00	00	3.517	0.48
We were given course objectives at the start of each learning module	11	4.3	293	91.4	11	4.3	00	00	3.621	0.07
The rationale for teaching each course unit was well laid out [to us]	16	6.1	234	89.6	11	4.3	00	00	3.019	1.73

Source: Primary data (2018)

Table 4.3 revealed that majority of the respondents (95.7%) agreed that they were given course outlines at the beginning of each learning module. However, 4.3% disagreed with the statement. These findings are consistent with Urevbu (1985), who observed that curriculum planning answers questions such as what should be taught. This is what is reflected in the findings. Besides, the researcher actualized this finding through the observation method where she observed that most students had the course outline of what was to be taught in matrix form, where what was to be taught was aligned with the week number for which they were supposed to be taught.

Furthermore, the majority (95.7%) respondents also agreed that they were given course objectives at the start of each learning module; while the remaining 4.3% negated the statement. Besides, Urevbu (1985) observed that curriculum planning entails how teaching should be done. Also, Urevbu (1985) adds that the objectives of what should be taught

should be in line with the various other components of the curriculum. This implies that on top of getting the course outline, the students were also given objectives of the course, which they used to show the relationship between the various topics taught in the course units. The researcher also observed from the course outline that the lecturers had prepared course objectives which they were to meet during the course of the study. Furthermore, the findings are consistent with Bishop (1985), who also argued that before deciding on what to teach, reasons should be established why a course unit should be taught. This implies that the lecturers would be organized, provided that they stuck to the objectives of the course as they had set them.

Considering the rationale of teaching, 95.7% of the respondents agreed that the rationale for teaching each course unit was well laid out to them. The remaining 4.3% were in disagreement. The findings are inconsistent with (NCHE, 2013) which observed that the curriculum did not provide answers to why a particular course unit was taught. However, there was no basis found for the rationing of the course units. This can be attributed to the fact that whereas there could be reasons for teaching a particular course unit, the National Council for Higher Education might not have acknowledged it as supported by Bringle and Hatcher (1996), who believed that universities should not be habitats for self-importance and service gap in the workplace.

The researcher also inquired from an ICT curriculum writer who, with his permission, granted that the researcher could use his credentials for the study. He is specifically a trained and experienced writer working at Makerere University in conjunction with the NCHE. He traced the history of the current ICT curriculum and said that:

The curriculum was first written in 2009. While there were no minimum standards at that time from NCHE, it was benchmarked from the international standards of ACMI triple standards (the international standards for ICT). It was developed out of the global emerging needs and not necessarily because the government developed interest in them.

As a rule, curriculum should be revised when the pioneers graduate. The program has undergone revisions.

On being asked why the curriculum was started without minimum standards, he stated that:

NCHE has skeleton staff to accredit the very many programs that are being started. Besides, the standards are subjective. He gave an example that, a woman on the accreditation committee would look out for gender sensitive issues in the curriculum, while a disabled may look for inclusiveness…this biases the standards. Also, he mentions that NCHE has no experts for all the fields that have to be accredited. This poses a challenge. He says that NCHE outsources local resources in terms of experts which experts are usually the same that developed a program, making it a weak link in terms of quality.

The strategies being put in place to ensure that computer science is relevant to the work place, he says that theories underpin any learning, so as long at the students have knowledge about theories, they should be able to apply these in any work situation.

Having a curriculum that is developed while benchmarked on an international standard (ACMI) which does not recognize political, educational, economic and social differences between the developing and developed countries is quite disproportionate. Besides, whereas revisions have been made since 2009, change in the workplace has not been appreciated by employers. There is hardly a good way of making food choices between benchmarking upon ACMI because most organizations depend on the knowledge and skills of these graduates. therefore, benchmarking on students' experiences would facilitate planning. Additionally, extremes such as gender bias and disability issues place planning at a higher risk by distorting the underlying assumption of curriculum planning which is translating theoretical knowledge into practical skills, which skills can be acquired by all genders and disabled persons. This lack of expertise in curriculum planning makes learning disables curriculum development.

4.2.2 The Relationship between ICT Curriculum Implementation and Workplace Performance of ICT Graduates

Table 4. 4: Frequencies for ICT curriculum implementing

Category	Strongly Agree		Agree		Disagree		Strongly Disagree		Mean	SD
	Freq	%	Freq	%	Freq	%	Freq	%		
We were given tests at the end of each course unit	94	36.1	167	63.9	00	00	00	00	3.36	0.42
We were assessed on the practical work that was given to us	00	00	234	89.6	27	10.4	00	00	2.90	0.15
We were given time for internship to practice in the field before we graduated	104	39.8	157	60.2	00	00	00	00	3.40	0.25

Source: Primary data (2018)

Table 4.4 shows that all the respondents (100%) agreed that they were given tests at the end of every course unit. Besides, Henard & Roseveare (2012) also point out the need for tests as a way of assessing the learning outcomes of the students as well as the lecturers. This implies that when the students do tests, the lecturers have opportunity to check whether what they teach is understandable and even so, presentable in the tests. However, the researcher thought that this approach is ineffective as it waits for the students to present what they think is correct so that an evaluation can be made, yet such an evaluation can be made every after a lecture. The researcher attended several lectures where she observed that none of the lecturers evaluated whether the students had understood what was taught. This then implies that the learning environment has not been worked on, where student-lecturer relationship is strong enough to foster students' contributions and teacher engagements (Henard & Roseveare, 2012).

Furthermore, 89.6% of the respondents agreed that they were assessed on their practical work that was given to them. However, 10.4% reported that they were never assessed on their practical work. In view of the above statement, the researcher observed from the computer laboratory during a practical session that less than 50 computers were switched on for computer science students. The researcher inquired from the computer lab attendants as to why majority of the computers were switched off. The lab attendant reported that he did not know the exact needs of the students. Besides, the researcher also observed that none of the students had a laptop and yet they were sharing these other computers. In one way or another, there is a large gap between the lab attendants and the students whereby understanding the needs of the students is ineffective in the lab. Lab attendants ought to provide practical hands-on skills to students but not understanding their needs is a big challenge. Why would students share computers? Is there a lack of software programs on these other computers? Are there restrictions on access to computers by

the students? All these questions raise doubts about the implementation of the curriculum and whether it translates into practical skills and knowledge acquisition for students in the real workplace.

Finally, concerning internship, all the respondents (100%) agreed that they had carried out internship in their various ICT-related fields before they graduated. However, the bigger question was whether the time allocated for internship was enough. The researcher inquired from some ICT students whether the internship time was enough for them to get acquainted with hands-on skills. Some respondents reported that:

> *We are taught so many things including programming in various computer languages, website designing, hardware and software development and troubleshooting, database management, systems design among others. How is one supposed to learn all these in two months?*

Creating a balance between all these subjects/ courses is hard especially with the time allocated to understanding them. The curriculum provides for teaching all these subjects but may not focus on specific knowledge acquisition for particular subjects which gives enough time to students to practice what they believe is required to meet the workplace demands. For instance, some workplaces want programmers while others need database managers and these skills are independent of each other. This means that a student who has practiced database management can increase workplace performance without getting more training since that is his profession right from the higher institution.

4.2.3 The Relationship Between ICT Curriculum Evaluation and Workplace Performance of ICT Graduates

Table 4. 5: Frequencies for ICT curriculum evaluation

Category	Strongly Agree		Agree		Disagree		Strongly Disagree		Mean	SD
	Freq	%	Freq	%	Freq	%	Freq	%		
I like the ICT course I undertook	53	20.3	198	75.9	10	3.8	00	00	3.16	0.52
At the end of each course unit, we were asked to evaluate the teaching and learning process	00	00	00	00	245	93.9	16	6.1	1.94	0.51
There are several similarities between what I learnt in class and what I currently do	6	2.3	193	73.9	62	23.8	00	00	2.79	0.29
I got additional training in ICT in order to perfect my skills	16	6.1	219	83.9	26	10	00	00	2.96	0.36
I feel that the lecturers selected to teach us were of quality and knew what they were teaching	27	10.3	234	89.6	00	00	00	00	3.10	2.51
I find less difficulty navigating around ICT related problems because of the adequate training I got	0	00	224	85.8	31	11.9	3	2.3	2.82	0.82
I would change the current trend of ICT training at universities	104	39.8	94	36.1	10	3.8	53	20.3	2.95	0.43
I feel I got adequate supervision visits from my supervisors during my internship	16	6.1	204	78.2	31	11.9	10	3.8	2.90	3.42

At my current workplaces, I have been involved in at least one study from my former university about how I am faring on with using knowledge acquired while there	00	00	00	00	245	93.9	16	6.1		1.27

Source: Primary data (2018)

Table 4.5 revealed that majority of the respondents (96.2%) reported that they liked the ICT course which they had undertaken. However, 3.8% did not like the course. Besides, Bhavard (2010) describes curriculum evaluation as the process of monitoring and reporting on the quality of education; implying that most respondents loved the Computer Science course. The researcher also employed the observation method where she attended four Computer Science lectures in one week. She noticed that some students, especially in the back rows, did not carry notebooks and they were not paying attention to the lecturers. She further interrogated some of them and inquired whether they understood what the lecturers were teaching. One student replied that:

I shall copy the notes from one of the colleagues.

Another student said,

I already work; I'm only here because my father wants me to have this degree.

From this observation, the researcher can conclude that there are no criteria for which the curriculum measures the intentions of students who were offered Computer Science. This is evident with Rodriguez et al (2010), who observed that whereas ICT was introduced in schools, its impact is still lacking. The researcher believes that this is partly because of the poor intentions

of the students. Whereas criteria is not measured for the Computer Science students, some courses at the university measure criterion of entry to the courses offered through pre-entry exams as a means of understanding the interests of the students in line with the courses offered for instance in Law where pre-entry exams are used as a determinant for producing high quality lawyers who meet the demands of the workplace.

Furthermore, table 4.5 shows that all the respondents (100%) disagreed with the statement that at the end of each course unit, they were requested to evaluate the teaching and learning process. The findings are inconsistent with Vallejos, Morel & Tusing (2017), who emphasized the need for engagement of students in the implementation process of a curriculum. This can be attributed to the fact that as soon as the course unit is over, the students are told to prepare for examinations and, therefore, no time was ever allocated to the evaluation of the teaching and learning process. Furthermore, this can be attributed to the fact that on the course outline, there is no provision for evaluation of the teaching and learning process, as the next item after the course unit was examinations. This gives no lecturer chance to check whether what he/ she has taught was understood and whether or not there is room for improvement. A conclusion can be made that there is no feedback provision in the curriculum, from which lecturers can improve their teaching skills. From the analysis, it is clear that curriculum implementation is centric to acquisition of knowledge to the student but not evaluating the knowledge acquisition methods. This means that lecturers can use similar means of teaching without assessing their effectiveness. This makes the lecturers knowledge bearers while the students are knowledge acquirers making the lecturers more knowledgeable than the students, making them kings over the students and therefore their teaching methods are unquestionable. However, there are various ways of learning which ought to be considered by lecturers thus the need for evaluation.

The table also shows that 76.2% of the respondents also agreed that there were several similarities between what they learnt in class and what they were employed to do. However, 23.8% reported that there were no similarities. The findings are similar to Henard and Roseveare (2012), who stated that quality teaching in higher education matters for student learning outcomes. The researcher inquired from some of these respondents about what was similar and what was not similar. One respondent pointed out that:

At least, I know how to install windows and Linux operating systems.

The researcher also observed one of the respondents installing Windows 10 operating system and some programs such as Microsoft Office, Adobe PDF reader among others on a Dell Vostro I-Core 3. The respondent reported that she had learnt installations from a systems administration class during recess term while in the University.

On the other hand, another respondent reported that:

I was biased by what we were taught in theory. Most of what we were taught was only surface; it was only an introduction and yet when we get to the field, our employers want in-depth knowledge about what we learnt.

One respondent, a network engineer, re-echoed one scenario where the employers required him to provide more than networking and rather add security to the networks. This was at his first job interview where he failed to get the job.

Table 4.5 also shows that majority of respondents (90%) got additional training in ICT in order to perfect their skills. However, the remaining 10% did not get any additional training in ICT to perfect their skills. The findings are inconsistent with the statement of Bobbit (1994) where he

focused education onto the adult life instead of the child life (as cited in Smith, Stanley & Shores, 1957) with a view that it is important to check relevancy of curriculum into workplaces, since that is what it is formed for. This can be attributed to the lack of enough practical skill impartation to students. As earlier identified by one respondent that he lost a job because he lacked the required networking skills, he further reported that he had to attend a different institution to acquire the required job market skills. He said:

In order to get the job, I had to join Aptec Institute where I studied 2 certificates in networking under CISCO – CCNA and CCNP certifications.

The researcher also asked him whether the skills he learnt while at university were enough to meet the job market. He rather replied that:

In networking, University only provided the basics of networking during recess term. However, we did not get certificates for networking. Additionally, because the skills were only at introductory level, one must get fully certified to be recognized as a network engineer in any ICT company.

This creates a gap in the implementation and evaluation of the ICT curriculum, right from development. This scenario questions why the networking course unit is offered in recess and more so, without certification for the practitioners of the ICT related course unit from the same university that offers the BSCs program in regular semester basis, yet certification is important for the job market.

Besides, the researcher also inquired from the employers of the graduates the importance of this certification. Firstly, the researcher observed through body language that some employers showed moderate levels of satisfaction regarding whether the graduates met their required skill

sets, by frowning. Also, some agreed but one employee totally disagreed. Furthermore, some employees indicated that in the event that the ICT graduates fail to meet the required skill set, they impart the skills using either internal or external resources. As one interviewee responded:

"We give them training material and manuals."

Another noted:

"We bring in professionals to train them."

Another pointed toward using internally available solutions by stating that:

"They learn from the old staff of the company."

Generally, the major theme found is that where a lackluster performance is noted, training is the remedy most referred to. Therefore, in view of training and offering of certificates, there is a level of trust that is achieved from employers. Besides, certification shows proof of proficiency in a particular field. However, when an institution does not provide one, there are many questions arising in the minds of employers about the efficiency and effectiveness of the hired graduate. However, Makerere University Kampala includes the marks on the graduates' transcripts but employers need certification for this particular skill. This means that, employers seek specificity of knowledge and skills rather than general knowledge about every ICT discipline. The researcher however cannot fault the university for not giving professional courses as part of the ICT curriculum training because this professional training offered is not in the objectives of the curriculum but rather, a desired element that lecturers usually encourage their students to undertake, alongside the designed curriculum, knowing its needed in the job market. Perhaps for the future curriculum

developers, they might consider imbedding this training within the streamlined curriculum.

Furthermore, the employers also pointed out a number of areas where the ICT graduates are found wanting and these include: programming or creative coding, both of which are technical areas. They are also found wanting in the non-technical aspects of their jobs. As one interviewee pointed out,

> *They are not open-minded and this limits their problem-solving abilities.*

Another pointed out that:

> *They lack adequate localized knowledge in developing systems that fit our work needs.*

However, the researcher also inquired from the curriculum writer who revealed and admitted that universities are not adequately preparing the students because of limited resources. For example, digital security requires about five computers per student but these are limited and are not enough. He also noted that while Computer Science took long to have minimum standards, he knows that he sat on the formulation of the standards for national council and right now, they are there.

> On the selection of materials to ensure the curriculum is taught as it is set out in planning, he mentioned various factors: Quality of lecturers, technical ability of the lecturer to deliver… The question would be; do they have the pedagogical skills? He mentioned that quality of lecturers is determined at quality assurance level; all those recruited should possess at least a Master's degree. This has been ensured.

This creates an implication that the university degree was insufficient for their current job market.

Regarding the quality of lectures, all the respondents agreed that they received quality lectures from their lecturers and that the lecturers knew what they were teaching. However, to further understand whether the lecturers knew what they were teaching, the researcher took up observation during lectures at the university. In some lectures, the researcher observed that most lecturers did not teach with projectors or laptops but they only wrote on the whiteboard. On all these days when the researcher was present, electricity was available in the lecture rooms, yet the lecturers did not inquire about the provision of the projector. The researcher also inquired from some Computer Science graduates whether they faced the same scenario where they studied without the projector, and many of the respondents reported that most times, the notes were power point presentations and thus required projection. Furthermore, since the procurement of the faculty generator in 2010, they had never complained about electricity during lectures, with exceptions when there was a major electricity fault. This raises a query to the lecturers as well as the curriculum developers, what the requirements for teaching ICT students are. Besides, the researcher also noticed that the lectures were so theoretical and the practical parts were also learnt in a theoretical perspective, for instance writing/ developing software through programming (Object oriented programming course unit). The researcher also observed that most lecturers lacked pedagogical skills when teaching. They only imparted information into the students but there was no basis for them to check whether the students had understood. This can also be viewed from the high standard deviation, which implies that there were various views which were not unanimous concerning the quality of lectures provided by the lecturers.

However, during an interview, the curriculum writer also noted that the quality of teaching was still insufficient. For example, he stated that:

"…a student requires much more materials to learn but the cost of the program is so low that it cannot meet the requirements. Therefore, materials are inadequate to prepare a learner to a satisfactory standard. There is also not adequate supervision of learners as well as exposure to the field training; there is little lecturer-to-student allocation, especially with on-field supervision. This compromises quality of the graduates to a standard that may be below what the employer needs."

On curriculum evaluation, the interviewee was so strong on this that he gave it a mere 35% scale when it comes to assessment of students. He agrees that lecturers are not as exposed to various learning environments through exchange programs to understand how assessment can be made for a Bachelor of Science student. They are operating on two levels of the blooms taxonomy of discovery and understanding but do not test application. Students cannot apply what they have learnt because exams are not application-based but focus on crammConcerning navigation around ICT-related problems, 85.8% of the respondents attributed their ability to troubleshoot ICT-related problems to the additional training that they got. However, the remaining 14.2% negated the statement. This can be attributed to the poor preparation of students to meet the challenges in the ICT world. This was supported by some employees in an interview where most of the employers were in disagreement with the preparation process of students from the university for the job market. Notable responses are shown below. One interviewee pointed out that:

I disagree. They have good marks but no skills.

Another interviewee noted thus:

I disagree. They have knowledge but they were not taught on applying it.

Another one stated that:

> *I disagree. They learn a lot of things but are not taught the most important in the field which is problem solving.*

Another stated:

> *I don't think. I disagree. I feel universities are just giving them basics and expecting them to self-learn the rest.*

Naturally, the employers noted that the curriculum writers need to include the following in preparing the ICT graduates for the world of work.

One stated:

> *More hands-on experience and also increase the need for students to work on real world problems.*

Another noted:

> *They need to impart practical training and problem-solving skills.*

The general consensus is that the universities impart only the technical skills but little in the way of innovativeness, practicality, problem solving and open-mindedness.

Naturally, those employers who cited problems with the ICT graduates indicate that the training they get at university is not satisfactory, and even those who say it is satisfactory state that there is still room for improvement, especially in the non-technical aspects of job preparedness.

As a result, training costs are cited as a major challenge in taking on fresh graduates in the respective companies. One interviewee pointed out another challenge:

> *You find those with better marks performing way less than those with average ones yet our expectations are always different and payments too.*

Another rounded up the general challenge faced with fresh ICT graduates:

> *They lack work conduct like time management and corporate behavior.*

The employers indicate they are satisfied with the students they recruit, but they need to practice the theories they learn, especially by getting more internship training before they graduate. Some responses are shown below:

"They should train the students to be flexible when it comes to tasks."

"The university should offer more apprenticeship training opportunities."

"They should be given more practicals during studying."

"The people making the curriculum should know and understand the needs in the market always because the needs in the market change so fast."

"There is need for practicality. Encourage the students to research. Embed ICT with humanities."

On the other hand, the researcher also inquired from an ICT curriculum writer, who also works with NCHE through an interview. When he was asked whether the curriculum adequately prepares students for employment, he argued that:

> *"University is for education. The curriculum writer emphasizes that employers need to separate education with workplace training. For example, Computer Science is a dynamic program and as such, the software that is trending while a student is learning may have been phased out by the time a graduate gets a job. This is where the employers feel that a university may not prepare the students adequately. He asserts that a university cannot fit in all workplace scenarios. He says that what a university is meant to do is to prepare a graduate, to be trainable!"*

Furthermore, table 4.5 also revealed that majority of the respondents (75.9%) reported that they would change the current trend of ICT training at universities. However, 24.1% of the respondents were rather satisfied with the current curriculum at the universities. The fact that majority of the respondents were not satisfied with the current ICT curriculum shows that there is a gap in the development of the curriculum. This can also be attributed to the fact that from the above mentioned observations and inquiries made, the curriculum is lacking some basic information which is necessary to both the lecturers and the students in terms of skills acquisition and meeting the job market standards and requirements.

Also, table 4.5 revealed that majority of the respondents (84.3%) agreed that they got adequate supervision visits from their supervisors during internship training. However, 15.7% reported that they did not get adequate supervision visits from their supervisors during internship. From inquiries made with the 2nd year students who had had internship placements previously, almost all of them reported that their supervisors visited their places of internship once and they evaluated their performance. However, some reported that their supervisors did not visit their places of internship because they were far from town.

Concerning projects done at the graduates' workplace, the researcher inquired from them whether they were involved in any study at the workplace where their university knowledge would help them around the study/ project. However, all the respondents (100%) reported that they were not involved in any study from their university about how they were faring with the knowledge acquired while at university. This implies that there is no monitoring and evaluation either from the development of the ICT curriculum or negligence of the lecturers.

In line with the above, the researcher inquired from the curriculum writer about what would be done in spite of the above mentioned queries. The interviewee reported that universities were developing policies against inbreeding (where a lecturer attains all levels of education from the same university). He suggested that lecturers needed to be exposed to other universities' curricula and learning environments.

4.3 Inferential analysis

In this section, correlation analysis was effected by the computation of the Pearson Rank correlation coefficient, while regression analysis was done for analysing the relationship between the three constructs (curriculum planning, curriculum implementation and curriculum evaluation). In this analysis, workplace performance was the dependent variable.

4.3.1 Correlation analysis

The Pearson Rank correlations coefficients were computed for the various relationships in order to estimate the strength of the relationships between the variables.

4.3.1.1 Hypotheses being tested

H_1: There is no relationship between ICT curriculum planning at universities and workplace performance of the ICT graduates.

H_2: There is no relationship between ICT curriculum implementation at universities and workplace performance of the ICT graduates.

H_3: There is no relationship between ICT curriculum evaluation at universities and workplace performance of ICT graduates

Table 4. 6: Correlations between independent and dependent variables

		Curriculum Planning	Curriculum Implementation	Curriculum Evaluation	Workplace Performance
Curriculum Planning	Pearson Corr	1			
	Sig. (2-tailed)				
	N	261			
Curriculum Implementation	Pearson Corr	.471*	1		
	Sig. (2-tailed)	.000			
	N	261	25		
Curriculum Evaluation	Pearson Corr	.615	.756*	1	
	Sig. (2-tailed)	.019	.029		
	N	261	261	261	
Workplace Performance	Pearson Corr	.756	.863	.510**	1
	Sig. (2-tailed)	.004	.031	.097	
	N	261	261	261	261

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

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

Source: Primary data (2018)

According to table 4.6, there is a strong positive relationship between curriculum planning and workplace performance. The table shows a Pearson's r = 0.756 and statistical significance of *p-value* = 0.004. This implies that when there is an increase in planning, there is a 0.756 positive

change in the workplace performance. This also means that curriculum planning accounts for 75.6% of workplace performance. From this analysis, the hypothesis that there is no relationship between curriculum planning and workplace performance can be rejected.

Additionally, there is also a strong positive relationship between curriculum implementation and workplace performance. Table 4.6 revealed that there is a Pearson's r = 0.863 and a statistical significance of *p-value* = 0.031. This implies that when implementation of the curriculum increases by 1 unit, workplace performance shall increase by 0.863 units. This also means that curriculum implementation accounts for 86.3% of workplace performance for graduates. Therefore, the hypothesis that there is no relationship between curriculum implementation and workplace performance can be rejected.

Furthermore, table 4.6 revealed that there was a medium positive relationship between curriculum evaluation and workplace performance as reflected by a Pearson's r = 0.510. However, there is no statistical significance as shown by a *p-value* = 0.097 which is greater than 0.05. This implies that the hypothesis that there is no relationship between curriculum evaluation and workplace performance can be accepted.

4.3.2 Regression Analysis

Regression analysis was used to compute the variation shared by the variables. It was used to identify how much of the variation workplace performance accounted for in the variation of curriculum development as presented in table 4.7.

Table 4. 7: Model Summary for the Regression analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.699[a]	.489	.471	.34797

a. Predictors: (Constant), Curriculum Planning, Curriculum Implementation, Curriculum Evaluation

Source: Primary data (2018)

From the model summary in table 4.7, the multiple regression coefficient R can be predicted by 0.699. This means that on the whole, curriculum development accounts for 69.9% of workplace performance. Furthermore, the table shows that workplace performance can be explained by a 48.9% (R^2) variance of curriculum development.

Table 4. 8: ANOVA table for the regression analysis

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	9.733	3	3.244	26.795	.000[a]
	Residual	10.171	84	.121		
	Total	19.904	87			

a. Dependent Variable: Workplace Performance

b. Predictors: (Constant), Curriculum Planning, Curriculum Implementation, Curriculum Evaluation

The ANOVA test is used to verify if a regression analysis is a better way of verifying the linear relationship between the curriculum development and workplace performance. From the ANOVA table above, the F-ratio, F(3, 84) = 26.795, *p-value* = 0.000 is statistically significant in determining the workplace performance of graduates.

Table 4. 9: Coefficients table

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.264	.290		4.356	.000
	Curriculum planning	.117	.110	.191	1.612	.023
	Curriculum implementation	.191	.188	.245	2.175	.032
	Curriculum evaluation	.274	.083	.352	3.085	.107

a. Dependent Variable: Workplace Performance

Source: Primary data (2018)

From the coefficients table 4.9, the prediction of workplace performance is 1.264 + (0.117 curriculum planning) + (0.191 curriculum implementation). From table 4.9, there are two significant variables which establish a relationship with workplace performance. With *p-value* = 0.23, an increment in curriculum planning by 1 unit leads to an increment in workplace performance by 0.117 units. Additionally, curriculum implementation plays a significant role in the prediction of workplace performance by 0.191 units.

CHAPTER FIVE

SUMMARY, DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter is organized in four sections. The first section deals with summary of the findings, followed by the discussions in relation to the research findings presented in Chapter Four. The third section focuses on the conclusion while the final section presents recommendations followed by areas for further research. The objectives were to establish the relationship between the ICT curriculum planning at universities and workplace performance of the ICT graduates, to examine the relationship between the ICT curriculum implementation at universities and workplace performance of the ICT graduates and to analyse the relationship between ICT curriculum evaluation at universities and workplace performance of ICT graduates. Data was collected using a survey questionnaire, observation and interview guide and was also analysed in relation to the three research questions.

5.2 Summary of the findings

5.2.1 The Relationship between the ICT curriculum planning and workplace performance of the ICT graduates

The study established the fact that students were given a course outline at the beginning of each learning module. This was evidenced by 95.7% of the respondents. Additionally, through observation, the researcher established her findings based on the actual presence of the course outline that was provided to her by some students. Similarly, 95.7% of the

respondents also revealed that they were given the course objectives, which specified the relationship between the course unit contents and their relationships with the course.

Likewise, an overwhelming majority of 95.7% of the respondents were in agreement that the rationale for teaching each course unit was well laid out to them. However, there were mixed results in this area as there was no basis on which to rate the rationale for the choice of teaching a course unit, as was also evidenced by a key informant who reported that the National Council for Higher Education had set the ICT curriculum without a minimum standard.

Furthermore, the hypothesis that there is no relationship between ICT curriculum planning and workplace performance was rejected basing on a Pearson's r correlation coefficient of r = 0.756 and *p-value* = 0.004; implying that curriculum planning accounted for 75.6% of workplace performance of the ICT graduates in the workplace.

5.2.2 The Relationship between ICT curriculum implementation and workplace performance of the ICT graduates

The study revealed that all the respondents (100%) disagreed to their participation in the evaluation process of each course unit by their lecturers. This could be attributed to the fact that on the course outline, there was no provision for evaluation of the teaching and learning process, as the curriculum gave way to preparations for examinations instead of evaluation.

The study also revealed that all the respondents were given tests at the end of every course unit as a means of checking whether they had understood the concepts and theoretical as

well as practical knowledge they had acquired. However, this was seen as an ineffective way of checking for whether the students had understood what the lecturers taught if they did not carry out evaluations at the end of every lecture. Additionally, concerning assessment of practical work, 89.6% of the respondents agreed that they were assessed on their practical work. However, the researcher observed that the computers used for a class were very few compared to the number of students using the computers and thus incapacitating their ability to fully gain hands-on skills. This was supported by a lab attendant who reported that he did not know the needs of the students.

Besides, all the respondents agreed that they had carried out internship in various ICT-related fields before graduation. However, time allocation for the period of internship was a major challenge, as majority of the respondents reported having a lot to cover in a short period of time.

The study also revealed that the hypothesis that there is no relationship between curriculum implementation and workplace performance was rejected basing on the inferential statistics provided by the Pearson's correlation coefficient of $r = 0.863$ and a statistically significant *p-value* = 0.031.

5.2.3 The Relationship between ICT curriculum evaluation and workplace performance of ICT graduates.

An overwhelming majority of 96.2% respondents revealed that they like the ICT course which they had undertaken. Additionally, there were 76.2% respondents who were in agreement with the fact that there were several similarities between what they learnt in class and what they were employed to do; thereby acknowledging the importance of the

practical skills that are needed in the ICT workplace. This was evidenced by the researcher when she saw the respondent make installations to a computer.

On the other hand, 90% of the respondents reported to having not been properly prepared for the job market as they had to take up trainings from the ICT firms, as well as other institutions that provided ICT-related courses, such as APTEC. The researcher also interviewed a key informant who acknowledged the inadequacy of the universities in preparing students for the job market; which he attributed to the lack of adequate supply of resources. To this, majority of the employees had to provide extra training to the ICT graduates to enable them fit in the workplace –which they reported as extraneous. This raises the question of whether the lecturers are of high quality, to which 100% of the respondents agreed, whereas the researcher's observation revealed the opposite as lecturers did not check on the students to see whether they had understood what had been taught. They lacked the basic pedagogical skills, much as they were knowledgeable about the course units they were teaching.

More so, 85.5% of the ICT employees reported that they could navigate around ICT-related problems because of the training they had received from the jobs as well as external institutions but not from their universities. Evidence was produced from various employers who were interviewed and rather questioned the curriculum as one which imparts knowledge but not skills. From this analysis, majority of the respondents (75.9%) advocated that they would change the current trend of ICT training at universities.

Finally, the study also revealed that the hypothesis that there is no relationship between curriculum evaluation and workplace performance of ICT graduates was accepted with a

Pearson's correlation coefficient r = 0.510 and a statistically non-significant *p-value* of 0.097.

5.3 Discussion of findings

This section discusses the findings according to the study objectives as laid out in the first chapter of this report. The implication of key findings is analysed according to the opinions of various scholars in order to arrive at a conclusion on the subject matter.

5.3.1 The ICT curriculum planning at universities and work place performance of the ICT graduates

The study determined that there is a significant positive relationship between curriculum planning and workplace performance of the ICT graduates. Basing on the systems theory, Walonick (1993), who proposed the need for inputs to generate outputs, this study would take up planning as an input to the proper establishment of the final output – workplace performance for ICT graduates. The inputs would include designing relevant course outlines, course objectives and rationale for teaching each course unit.

Therefore, having the right inputs is consistent with Urevbu (1985), who observed that curriculum planning answers questions on what should be taught and how it should be taught, as well as Bishop's (1985) analysis that emphasizes the need for a clear definition of why one would teach a course unit rather than the process of teaching the course unit.

Furthermore, the study identifies the need to revise the curriculum with the aim of including minimum standards, especially for which lecturers should follow especially in

decision-making about the reasons for teaching a course unit. This is in line with Bishop (1985), who emphasizes the same.

5.3.2 The ICT curriculum implementation at universities and workplace performance of the ICT graduates

The study determined that there is a significant positive relationship between curriculum implementation and workplace performance of ICT graduates, starting with the need for testing students at the end of every course unit. More so, the study emphasizes the need for testing students at the end of every class rather than waiting till the end of a module. This way, the ability of a student to understand and later on implement what has been taught would be achieved.

Furthermore, the study emphasizes the need for extending the internship period in order to enable the students completely grasp the hands-on skills which they are taught during internship. Such skills are considered helpful in meeting the job requirements of the graduates. This way, when the implementation of the theorized skills learnt in class is actualized through internship, the job market would be favourable for the graduates.

Besides, as one interviewee acknowledged, the universities are not adequately preparing the students because of limited resources. This is despite the fact that higher education was earmarked as an urgent need and thus expanded - scholarships and further trainings were secured so as to equip people with skills. This, therefore, agrees with the employers that students are not innovative - as this was a question asked of employers; what they felt their employees lacked; majority mentioning lack of an innovative mind, flexibility and problem-solving skills. Students need to develop competencies that are not addressed in

the traditional curricula and in this case it seems that Uganda subscribes to the traditional approach to curriculum development as pointed out by Voogt and Pelgrum (2005). Kouwenhoven (2007) notes that curricula development is a tick list of skills and a set of generic abilities that transcends disciplinary knowledge and skills.

5.3.3 The ICT curriculum evaluation at universities and workplace performance of ICT graduates.

The study revealed that much as Computer Science is a likable course, there is need to evaluate the intentions of the students who take it up as the researcher observed some discrepancies in the students who took up the course. Their focus was on basic passing rather than attaining a skill. This way, Rodriguez's (2010) observation of the lacking impact of ICT can be escaped. The findings seem to contradict Dewey (1902), who was of the view that the curriculum should ultimately produce students who would be able to deal effectively with the modern world. In essence, the input should undergo a process to produce an output that would deal with the modern world as per the systems theory.

Furthermore, the study also emphasizes the need for evaluation of the teaching and learning process at the end of each course unit, in order to better the delivery mode of teaching by the lecturers. This is in agreement with Vallejos, Morel & Tusing (2017) who emphasized the need for engagement of students in the evaluation process of a curriculum.

The results also seem to confirm the National ICT Policy of Uganda (2003), which reveals that it is impossible to judge the competence of graduates from these institutions by

looking at their certificates, and this is owed to the shortcomings of the ICT curricula development process.

As noted by Bharvad (2010), curriculum evaluation monitors and reports on the quality of education, but it just does not stop there. Action taken on the reports of the quality of education is important.

5.4 Conclusions

The purpose of this study was to ascertain the relationships between the different constructs of the ICT curriculum and workplace performance of ICT graduates, using ICT graduates from Makerere University as a case study. Based on the study findings, several conclusions were made:

5.4.1 The ICT curriculum planning at universities and work place performance of the ICT graduates

The study establishes the fact that having the right input under the Systems theory generates the right output, implying that putting emphasis of the correct course objectives as well as course outline would enable students to understand their role in the employment field. More so, this can also be achieved through setting a minimum standard for which the course outline should be laid out and should be used as basis for establishing reasons for teaching a course unit. Additionally, the study revealed that quality lecturers with the basic pedagogical skills would enable the proper attainment of the required job market skills as they would understand how to pass on skills and knowledge to students rather than teaching them how to cram in order to pass examinations.

5.4.2 The ICT curriculum implementation at universities and workplace performance of the ICT graduates

The study establishes the fact that implementation of the ICT curriculum is dependent on the planning process, especially with the quality of inputs right from curriculum planning. Therefore, much as examinations and tests are given at the end of each course unit, there is need to understand that what is set in the tests and examinations is beneficial to the practical skill set of the student after graduation. Therefore, assessment on practical work and internship placement should be emphasized so that a properly streamlined graduate (service provider/ employee) is beneficial to the job market. Besides, the study recognizes that curriculum implementation highly influences workplace performance and yet the study measures workplace performance in terms of application of theoretical into practical, as well as the ability to implement the acquired skills in the job market.

5.4.3 The ICT curriculum evaluation at universities and workplace performance of ICT graduates

The study results confirm that universities were producing graduates whose quality of degree qualification was questioned by employers, especially personal and professional competencies. Makerere University ICT graduates seem to have satisfactory levels of technical skills but are severely lacking in the other aspects of their jobs.

There is nothing practical that has been done in the way of assessment of students learning or even the teaching program. Whereas curriculum reviews are reportedly undertaken, these are not done on a regular basis due to resource constraints, and even positive results of past reviews have not been shown.

5.5 Recommendations

In light of the study conclusions, a number of recommendations were made, with emphasis on recommending as per the objectives of the study.

5.5.1 The ICT curriculum planning at universities and work place performance of the ICT graduates

There is need for proper planning through proper utilization of the ICT curriculum writers. This calls for more research about curriculum development through making comparative studies with the education systems from other countries, especially the First World countries.

There is need to training lecturers on the basic pedagogical skills before they start teaching students. This way, the same repetition of the poor curriculum can be reduced as these skills shall enable the lecturer to identify students who need more attention during lectures rather than waiting for examination time.

Curriculum writers should emphasize the acquisition and impartation of practical skills rather than theoretical emphasis. This means that in order to meet the job standards, the ability of a student to implement what he/ she learnt at university is paramount to the acquisition of job security and employment at large. Therefore, practical skills are a must for curriculum planning in a bid to meet the ever changing and ever demanding needs of the job market.

The curriculum must include many practical programs which shall enable the graduates to attain the required skills in the job market. This can be done through including practical

examinations in the curriculum. Furthermore, the practical examinations can be used as a baseline for excellence by the university in order for a student to graduate, thus meeting the job market requirements in the ICT-related fields.

5.5.2 The ICT curriculum implementation at universities and workplace performance of the ICT graduates

Internship placement must be allocated more time, as there are many practical skills which are imparted unto students. A student's ability to grasp these skills is beneficial to meeting the demands on in the ICT job market. Besides, this increases a student's exposure to various ICT-related problems, for which he/ she can troubleshoot as a result of exposure.

Furthermore, acknowledging the fact that the university offers diversity of knowledge, there is need to offer and concentrate on specialization of skills and knowledge. This shall enable the provision of in-depth knowledge about an ICT problem, provided that the individual is knowledgeable in the field, unlike the diversification of knowledge where all individuals acquire surface knowledge (introductory knowledge).

Inclusion of practical examinations and tests rather than the theoretical tests and examinations only.

There is need for inclusion of practical examinations for students in order to gain exposure. This means that practical exams must be included in the examinations period, just as the theoretical examinations are included. This shall enable the students to get exposure to the different ICT problems which can be encountered in real life. Furthermore, practical examinations enable a real-time check on whether a student is

ready for the job market or not. It is also a better way of assessing the practical/ real time performance of a student before getting into the job market.

The university should offer meaningful training which can be accessed elsewhere. This means that the university should incorporate trainings, especially in the practical field and upon excelling, a student must be awarded an internationally recognized certificate such as CCNA, CCNP, Microsoft certification, Oracle Database certification among others.

5.5.3 The ICT curriculum evaluation at universities and workplace performance of ICT graduates

At the end of each course unit, ICT graduates should be asked to evaluate the teaching and learning process and action be taken immediately before the course is next offered by the university.

ICT lecturers should also assess not only the knowledge and comprehension of the content but as identified in the blooms taxonomy, the students should be assessed on the application of knowledge to actual situations.

ICT fresh graduates should be involved in at least one study from their former university about how they are faring with using knowledge acquired while there, so as to provide helpful feedback on the way forward in how the ICT curricula development can aid workplace performance of ICT graduates.

5.6 Limitations to the Study

(i) The study was limited to ICT graduates from Makerere University, yet there are graduates in other disciplines from the university.

(ii) Reliable information on performance of fresh graduates on the job is still limited. The researcher tried as much as possible to collect primary data from the field in order to make a valuable contribution to filling this literature gap.

(iii) Lack of cooperation from some of the respondents was experienced by the researcher but this was offset by early testing of the questionnaire in order to acquaint the respondents with its contents and what was required of them in the actual study.

5.7 Areas for Further Research

The study has focused on university ICT curricula development and workplace performance of ICT graduates of the Bachelor of Science in Computer Science programme at Makerere University. Future research should explore the following areas:

i. The researcher recommends future scholars to extend the study to other universities in the country to ascertain whether similar factors affect workplace performance of their ICT graduates.

ii. This study used a sequential exploratory research design approach, the behavior of the variables over time was therefore not analyzed, which restricts the applicability of the findings. Future studies should conduct longitudinal studies to cross validate these findings.

iii. Future research should be conducted over a longer time scope, for example 5-10 years, in order to ascertain the performance trends of ICT graduates over a longer period of time. This is because workplace performance cannot easily be evaluated from someone who has spent two years.

References

Bringle, R.G & Hatcher, J.A (1996). Implementing service learning in higher education: *A journal of Higher education*, vol 67 no.2 Mar-April, 1996.Cole, G. A. (2004).

David J. Flinders & Steven Thornton (1997): The Curriculum studies reader, Routledge London.

Bishop, G (1985) *Curriculum Development: A textbook for students.* MacMillan.

Golola, D. G., & Balalye, F., (2001); Evaluation of teaching effectiveness in higher education.

Henard, S.,& Roseveare, G., (2012): Fostering Quality Teaching in Higher Education: Policies and Practices. Retrieved from; https://www.oecd.org/edu/imhe/QT%20policies%20and%20practices.pdf

McKimm, J., (2007). *Curriculum design and development*. A paper written as part of a project led by the London Deanery to provide a Web-based learning resource retrieved from www.faculty.londoneanery.ac.uk.

Katorobo, J. (1982). *Education for Public Service in Uganda.* Vantage Press.

Kothari, C.R. (2004). Research Methodology: Methods and techniques. New age international publishers limited, India.

Kuhn, A. (1974). *The Logic of Social Systems*. San Francisco: Jossey-Bass.

Little, J. C., Granger, M. J., Boyle, R., Gerhardt-Powals, J., Impagliazzo, J., Janik, C., Kubilus, N. J., Lippert, S. K., McCracken, W. M., Paliwoda, G., & Soja. P.,(1999). Integrating Professionalism and workplace issues into the computing and information technology, *a report of ITiCSE'99 working group on professionalism*31(4), 106.

Makerere University (2010) *Curriculum for BIT, Faculty of ICT*. Makerere University

National Council for Higher Education (2013) *Tracer Study of 2005 graduates from five universities and four colleges*. NCHE.

National ICT Competency Standards of the Phillipines (n.d). *Competence Standards*. Retrieved from https:// www.ncc.gov.ph/nics/files/NICS-Advanced.pdf.

National Development Plan (2010/2015). *ICT Strategic Plan*. Retrieved from www.ict.go.ug. Parsons, J. (2012). *From Knowledge to Action: Shaping the future of curriculum development in Alberta*.ISBN 978-1-4601-03268-S (Online).

Rodríguez, P., Nussbaum, M., López, X., & Sepúlveda, M. (2010). A Monitoring and Evaluation Scheme for an ICT-Supported Education Program in Schools. Educational Technology & Society, 13 (2), 166–179. Retrieved from;https://search.proquest.com/openview/805372da445c78e8a52936cfcd96b7c2/1?pq-origsite=gscholar&cbl=1586335.

Siriporn, Y.,&McLean, G. N., (2001). Theories supporting transfer of training.*Human Resource Development Quarterly*, 12: 195-208. doi:10.1002/hrdq.7

SCANS., (1991). *Work place skills* (*Report on U.S Department of Labor*) Retrieved from *http://wdr.doleta.gov/SCANS/whatwork/whatwork.pdf-*.

Simon, Roger I. (1991). *Learning work: A critical pedagogy of work education*. Greenwood publishing group.

Tyler, W. R. (2013). *Basic Principles of Curriculum and Instruction*. University of Chicago Press.

The National Commission on Excellence in Education (1983). *A Nation at Risk:The Imperative for Educational Reform* (United States Department of Education Report) retrieved from http://datacenter.spps.org/uploads/sotw_a_nation_at_risk_1983.pdf

Uganda Christian University (n.d) -*IT Curriculum.* UCU

Urevbu, A (1985). *Curriculum studies*. Longman group ltd.

Vallejos, Morel and Tusing (2017)., Implementation of competency-based curriculum. *The Journal of Competency-Based Education.*Retrieved from http://onlinelibrary.wiley.com/doi/10.1002/cbe2.1038/full

Voogt, J &Pegrum, H. (2005). ICT and curriculum change. *Human technology: An interdisciplinary journal on humans in ICT environments*, 2005. Vol 1(2).

Wells, S. (2017), *Gordon. Thorndike.pdf*. retrieved from, http://people.ucsc.edu/gwells/files/courses

Walsh J. (2014) 'The Transformation of Higher Education in Ireland, 1945-80'in, A. Loxley, A. Seery and J. Walsh(Eds), *Higher education in Ireland: practices, policies and possibilities.* Basingstoke, Palgrave Macmillan.

WalonickD. S., (1993)*General Systems retrieved from http://www.statpac.org/walonick/systems-theory.html*

Ramaley. J.A., (2014)., The Changing Role of Higher Education: Learning to Deal with Wicked Problems. *Journal of Higher Education Outreach and Engagement,* 18(3). University of Georgia. ISSN 1534-6104.

Chan. R.Y., (2016)., *Understanding the purpose of higher education: An analysis of the economic and social benefits for completing a college degree*. Indiana University Bloomington.

Stockton. W.L. (2004)., *A Philosophy of the Idea of Christian Liberal Arts Education. Why is it important?* Dallas Baptist University.

UNESCO., (1991)., *The Role of Higher Education in Society: Quality and Pertinence*. 2nd UNESCO- Non-Governmental organizations Collective Consultation on Higher Education, Paris.

Sawi. G.E. (1996)., *Curriculum Development Guide: Population Education for Non-Formal Education Programs of Out-of-School Rural Youth*. Food and Agriculture Organization of the United Nations.

Bloom, B.S. (Ed.). Engelhart, M.D., Furst, E.J., Hill, W.H., Krathwohl, D.R. (1956). *Taxonomy of Educational Objectives, Handbook I: The Cognitive Domain.* New York: David McKay Co Inc.

Palvalin, M., Lönnqvist, A., & Vuolle, M. (2013). Analysing the impacts of ICT on knowledge work productivity. *Journal of Knowledge Management*, 17(4), 545-557. DOI: 10.1108/JKM-03-2013-0113.

Laihonen H., Jääskeläinen A., Lönnqvist A. and Ruostela J. (2012), "Measuring the impacts of new ways of working", *Journal of Facilities Management*, Vol. 10 No. 2, pp. 102-113.

Kofi, A., (2010)., Relationship between students' attitudes toward ICT and their achievement in ICT at the University of Cape Coast., *International Journal of Basic Education*, Vol 1.

Yalcinalp, S. (2005). *A study of students' self-efficacy, performance and attitudes towards computers and internet in a computer literacy course at Freshman*. Accessed from http://www.leeds.ac.uk/educol/document/144039.htm on 22/02/2019.

Fuchs. T., & Woessmann, L. (2004). Computers and Student Learning: Bivariate and Multivariate Evidence on the Availability and Use of Computers at Home and at School, *CESifo Working Paper*. No. 1321.

Liu, L., Maddux, C., & Johnson, L. (2006). Computer Attitude and Achievement: Is Time an Intermediate Variable?. *Journal of Technology and Teacher Education,* 12(4), 593-607.

Jegede, P., Dibu-Ojerinde, O.O., & Olugbenga, M. (2007). Relationships between ICT competence and attitude among some Nigerian tertiary institution lecturers. *Educational Research and Review*, 2 (7).

Rajendar, K., (2008)., *Research Methodology*., New Delhi., S.B. Nangia for APH Publishing Corporation

Tavakoli, H., (2012)., *A Dictionary of Research Methodology and Statistics in Applied Linguistics*., Rahnama Press.

Lisa, M.G., (2008)., *The Sage encyclopedia of qualitative research methods: Volumes 1 and 2*., Thousand Oaks, California., SAGE Publications, Inc.

Milligan, K., (2006)., *Using Information and Communication Technology in the Workplace*. Australian Research Alliance for Children and Youth.

Appendices

Appendix I: Interview schedule for Curriculum Writers

Dear respondent, my name is Nanteza Ruth Ssebagalaa student of Uganda Management Institute. I am conducting an academic research intended toassessUniversity ICT Curricula Developmentand Workplace Performance ofICTGraduates. The purpose of this study and its findings is purely academic. I kindly request for your assistance by, sparing some of your precious time to respond to a number of questions, pertaining the study. The study will take about 30 minutes only. All information provided will be handled and treated with utmost confidentiality. Thank you

Key Questions

a) Curriculum planning and work place performance

1. Tell me about the curriculum planning of ICT? (Probe for the years in existence, motivation for writing the curriculum, the purpose of its implementation...)

2. What challenges inform you in curriculum writing?

3. On the overall, how has the curriculum been pivotal in preparing graduates? (Probe for relevance, statistics, quality of graduates, openness, weaknesses of workforce etc.…)

4. What is the relationship between ICT curriculum planning and workplace performance? (Elaborate with examples)

5. What strategies are being put in place to ensure the Bachelor of Science in computer science is relevant to the work place?

6. Comment on the accreditation of most of other ICT programs but NOT, the Bachelor of Sciences program by NCHE? (Probe for duplication of programs, relevance of the program and future prospects of the relevance of the program)

b) Curriculum implementation and workplace performance

1. Tell me about content for the program of BscCSc and how you arrive at the selection procedures to determine its worthiness of teaching it? (Probe and ensure that the respondent mentions and defines how they arrive at content selection and who verifies it)

2. How is the selection for materials used in teaching this content arrived? Prove to determine who or which teams flag off the materials used for the program, the variousmaterials used in implementation, what may be missing but relevant, etc

3. How do you see the relationship between curriculum implementation and workplace performance in the graduates that have been sent out? (Elaborate with examples and probe to see any missing links and gaps and what they are doing about this)

4. As an implementer, would you say, in comparison to other ICT programs, that there seems to be a duplication of courses in ICT and particularly the BscCSc? If yes, have you addressed these duplication content with the writers? What have they done about it?

5. Would you confidently state that this program prepares the graduates in a special way that if it wasn't there, the employment world would miss out on a breed of competence among the ICT workers?

6. Please comment about the adequacy of the materials, equipment for the students. Would you say, these are enough to accord each student adequate learning in preparation for the workplace?

7. Is there any other information that you feel you'd like to add that shall enrich this research in terms of determining the relevance of the curriculum to the workplace?

c. Curriculum evaluation and Workplace performance

1. Is the curriculum implemented the way it is intended when planning it? (please elaborate)

2. Do you consult the potential employers to determine the work place needs before designing a curriculum?

3. When carrying out evaluation of learning, what are the standards that inform you that you are assessing for workplace standard and expectations?

4. Has this curriculum undergone any improvement to suit the current needs of the employer, since it was first written?

5. Are there any internal quality assurance systems to ensure that the curriculum used is delivered consistently and precisely so as to ensure quality graduates are produced?

6. Has the program done any tracer studies on its graduates to determine how they are using the knowledge acquired, at their respective workplaces?

7. What areas have you felt the current ICT curriculum misses out in the work place demands?

8. How are these gaps hoped to be addressed?

Appendix II: Interview for Employers

Dear respondent,

I am carrying out research on the relevance of ICT curriculum implementation of Universities at work places. Your response shall go a long way in assessing the current curriculum of ICT and how it meets the needs of workplace.

This questionnaire is likely to last about 15 minutes of your time.

Thank you very much.

Sincerely,

Ruth Nanteza Ssebagala.

1. Name of Respondent: …….

2. Occupation: …….

3: Date of interview:……

Section A: Relevancy of ICT Curriculum in preparing graduates for work

4. How many ICT graduates do you employ per year?

…….

5. Do the fresh graduates that get jobs in this institution meet your required skills?

.....

6. In the event that they don't meet the required skill set, what does the institution do to prepare them for the required standard of work?

.....

.....

7. In what areas are the ICT fresh graduates found wanting, in terms of skills?

.....

.....

8. Would you assert that the curriculum has adequately prepared them? If yes, explain

……

……

……

9. What would you wish the curriculum writers need to include in preparing the ICT graduates for the world of work?

……

……

……

10. Would you say the current ICT training is; satisfactory, or lacking?

.....

.....

10. What are some of the challenges you face when taking on the fresh ICT graduates in this institution?

.....

.....

11. Would you commend the current ICT curriculum in preparing graduates for the world of work or would you recommend changes to it? If recommendations are needed, what would those be?

.....

.....

.....

12. Please recommend how best the ICT curriculum would best suit the needs of the work place environment by citing areas it should emphasize on in preparing the upcoming ICT graduates

……

……

……

Appendix III: List of Documents to review

	DOCUMENTS	Area of focus
1.	University Bachelor of Science in Computer Science Curriculum	- content as related to the work place needs - equipment recommended for use - time allocated for practical studies
2.	ICT national policy	- the national standards for an ICT professional - Rationale for ICT advancement - The vision of ICT in development and workplace demands
3	NCHE accreditation guidelines	- criteria for accrediting a program - why the BscSc was not accredited - What plans are there for a program that runs without accreditation
4	NCHE tracer studies	- Graduates perceptions towards programs undergone - Employers' impressions of ICT graduates
5	International standards for ICT skills	What are the international benchmarks for ICT programs? Have curriculum writers, accreditation bodies achieved

		these standards?
7	ICT ministry papers	What are the impressions of government towards the ICT curriculum in preparation of competent graduates?
9	National Development Plan	What does the NDP say in utilising ICT sector towards the development of the country? What are its expectations? How does this inform the curriculum writers?

Appendix IV: Questionnaire for ICT Graduates

Dear respondent,

I am carrying out research on the relevance of ICT curriculum development of Universities at work places. Your response shall go a long way in assessing the current curriculum of ICT and how it meets the needs of workplace.

This questionnaire is likely to last about 15 minutes of your time.

Thank you very much.

Sincerely,

Ruth Nanteza Ssebagala.

1. Occupation: …….

2. Place of work: ……

3. Date of interview:……

4. In which year were you employed? ……

5. When did you graduate? …….

Relevance of ICT Curriculum development in preparing graduates for work.

Kindly fill out the following questionnaire by indicating; a) strongly agree b) c) Disagree d) Strongly disagree. Thank you very much.

	Question	**Strongly Agree**	**Agree**	**Disagree**	**Strongly disagree**
1	I like the ICT course I undertook				
2	What I do is directly linked to what I studied				
3	There are several similarities between what I learnt in class and what I currently do				
4	I got additional training in ICT in order to perfect my skills				
5	I feel that the lecturers selected to teach us were of quality and knew what they were teaching				
6	I was satisfied with my lectures				
7	The lecturers prepared me well for the world of my current work				
8	We were given course outlines at the beginning of each learning module				
9	We were given course objectives at the start of each learning module				
10	The rationale for teaching each course unit was well laid out to us				
11	I didn't need additional training to carry out my current tasks				
12	I usually meet my supervisors' expectations				
13	At the end of each course unit, we were asked to evaluate the teaching and learning process			.	

14	I feel the current ICT training at universities should be maintained as it is				
15	The current ICT curriculum is adequate for the ICT needs found at work places				
16.	My employer didn't have to re-train me				
17	I find less difficulty navigating around ICT related problems because of the adequate training I got				
18	I would recommend the ICT training as relevant to the world of work				
19	I would change the current trend of ICT training at universities				
20	I did not have to acquire extra skills to do my current job				
21	We were availed feedback from the course evaluations we had carried out at the end of each course unit				
22	We were given tests at the end of each course unit				
23	We were assessed on the practical work that was given to us				
24	We were given time for internship to practice in the field before we graduated				
25	I feel I got adequate supervision visits from my supervisors during my internship				
26	At my current workplaces, I have been involved in at least one study from my former university about how I am faring on with using knowledge acquired while there				

Appendix V: Observation Checklist

i. ICT curriculum writers at universities

ii. NCHE staff concerned with accrediting ICT curriculum

iii. Government person regulating policy on ICT implementation

iv. Computer laboratory classes

v. Functionality of computer laboratory equipment

vi. Attention of students in classes and inquiry

vii. Number of students who access computers

viii. How lecturers impart knowledge and skills during theoretical lectures

APPENDIX VI: LETTER OF INTRODUCTION

UGANDA MANAGEMENT INSTITUTE

Telephones: 256-41-4259722 /4223748 /4346620
256-31-2265138 /39 /40
256-75-2259722
Telefax: 256-41-4259581 /314
E-mail: admin@umi.ac.ug

Plot 44-52, Jinja Road
P.O. Box 20131
Kampala, Uganda
Website: http://www.umi.ac.ug

Your Ref: G/35 **12th November, 2017**

Our Ref: **TO WHOM IT MAY CONCERN**

MASTERS IN HIGHER EDUCATION MANAGEMENT DEGREE

Ms. Ruth Nanteza Ssebaggala is a student of the Masters in Higher Education Management of Uganda Management Institute 1st intake 2012/2013, **Reg. Number 12/MHEMA/01/ 001.**

The purpose of this letter is to formally request you to allow this participant to access any information in your custody/organization, which is relevant to her research.

Her research Topic is: "***University ICT Curricula Development and Workplace Performance of ICT Graduates: a case of Makerere University Bachelor of Science in Computer Science Curriculum***".

Yours Sincerely,

Dr. Maria V. K. Barifaijo
HEAD, EDUCATIONAL LEADERSHIP & MANAGEMENT

APPENDIX VII: FIELD RESEARCH LETTER

UGANDA MANAGEMENT INSTITUTE

Telephones: 256-41-4259722 /4223748 /4346620
256-31-2265138 /39 /40
256-75-2259722
Telefax: 256-41-4259581 /314
E-mail: admin@umi.ac.ug

Plot 44-52, Jinja Road
P.O. Box 20131
Kampala, Uganda
Website: http://www.umi.ac.ug

Your Ref:

Our Ref: **Cg/35** 12th November, 2017

Ms. Ruth Nanteza Ssebaggala
12/MHEMA/01/001

Dear Ms. Nanteza,

FIELD RESEARCH

Following a successful defense of your proposal before a panel of Masters Defense Committee and the inclusion of suggested comments, I wish to recommend you to proceed for fieldwork.

Please note that the previous chapters 1, 2 and 3 will need to be continuously improved and updated as you progress in your research work.

Wishing you the best in the field.

Yours sincerely,

Dr. Maria V. K. Barifaijo
HEAD, EDUCATIONAL LEADERSHIP & MANAGEMENT