

Quality Benchmarks and the Management of Massification
in Science-Based Faculties at Gulu University

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A Thesis Submitted in Fulfilment of the Requirements for the award of the Degree of
Doctor of Philosophy of Gulu University

January 2014

Declaration

I declare that this dissertation is my original idea and has not been submitted for any award in any institution of higher learning.

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Dedication

I dedicate this work to the agony of my mum after the fatal accident that befell her.

Acknowledgements

I wish to acknowledge the following persons without whose support this doctoral dissertation would have been to no avail. First and foremost, the Vice Chancellor and the Management Team of Gulu University, who encouraged the University staff to go to greater heights in the field of academics, pursue their PhD studies and embark on scientific research and support the nation's development.

In a special way I would like to acknowledge Prof. Paul Okot-Bwangamoi, former Director of the Institute of Research and Graduate Studies at Gulu University, who one time asked me during a light discussion; "when would you like to push hard for development?" Less did I understand his question until when he simplified it; "when will you do your PhD studies?" This other than being a simple question was also a challenge and an encouragement which guided and drove my aspirations for the doctoral studies.

I wish to express my profound gratitude to Prof. J. P. Ocitti and Associate Professor Dr. Peter Neema-Abooki who supervised every step I took in undertaking this doctoral work. I sincerely thank them for their encouragement, comments, suggestions, academic whipping, instructions and wise counsel. Further gratitude goes to ENRECA Gulu University and the College of Health Sciences Makerere University for the training in statistics epidemiology from which I benefitted substantially and perfected my knowledge in research methodology and data management.

I am also indebted to Mr. Oceng Robert Odok commissioner for Higher Education in the Ministry of Education and Sports for supporting my cause especially in providing relevant reference materials and all the morale support he rendered.

Mr. Gilbert Uwonda, was very instrumental in this study especially in guiding me through the process of data analysis; many thanks and gratitude. Francis Nyeko for proper type-setting of the document. I also extend special gratitude to the two students whose masters' dissertations I supervised: Grace Mbabazi Kasigwa and Moses Cik whose works inspired me and broadened my scope in the field of research. To all, who might have supported me in one way or the other, but have not been mentioned by name in this acknowledgement, many thanks and God's blessing.

Lastly, I owe my family members what the world cannot reward for their understanding, tolerance and love, especially for allowing me to share with them the little family resources during the course of this study. May the Lord reward you all abundantly.

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List of Abbreviations and Acronyms

AR	Academic Registrar
ARACIS	Romanian Agency for Quality Assurance in Higher Education
AUCEA	Australian Universities Community Engagement Alliance
CHE	Council for Higher Education
DOP	Director of Planning
DVC	Deputy Vice Chancellor
HEQC	Higher Education Quality Committee
HKSAR	Hong Kong Special Administrative Region
MCAST	Malta College of Arts, Science and Technology
MoE&S	Ministry of Education and Sports
MUBS	Makerere University Business School
MUST	Mbarara University of Science and Technology
NCHE	National Council for Higher Education
OCED	Organization for Economic Cooperation and Development
SSRS	Students-Staff Ratios
SAUVCA	South African University Vice Chancellor Association
UACE	Uganda Advance Certificate of Education

UB	University Bursar
UCE	Uganda Certificate of Education
UL	University Librarian
UNESCO	United Nation Educational Scientific Cultural Organization
UOTIA	Universities and Other Tertiary Institutions Act
US	University Secretary
VC	Vice Chancellor
VCPU	Visitation Committee on Public University

Abstract

The study addressed the management of massification in the Science-based Faculties at Gulu University guided by the National Council for Higher Education Quality Benchmarks. The study used the single-case study and parallel sample cross-sectional survey design. It covered three science-based departments: Human Anatomy, Computer Science and Bio-Systems Engineering. 294 respondents participated in the study out of the 417 targeted.

The sampling techniques used were purposive, random and stratified. Data collection instruments included closed ended structured questionnaires, oral interview schedules, direct observation guide, focus group discussion guides and the archival record guides. Raw data was presented and analyzed by use of descriptive statistics.

Major findings indicated that the science-based faculties at Gulu University are experiencing massification: Increasing students' enrolment against insufficient educational resources, inadequate and un-customized infrastructure, large students to lecturer ratio and unplanned diversification of programmes.

In light of the findings therefore, the study recommends that Science-based faculties at Gulu University should draw their development plans mindful of the National Council for Higher Education's (NCHE) quality standards in order to address massification tendencies in the University. It further recommended that the University Management must tally students' enrolment commensurately with improvement in the education resources, facilities and infrastructure.

The study suggested that further research needs to be carried out in the Universities, to determine how the challenges posed by massification can be addressed and turned into opportunities. Finally it opined that massification should be studied from the perspective of Corporate Management especially with regards to infrastructural planning, education resource allocation and funding.

Chapter One: Introduction

This chapter deals with the background of the study. The presentation of themes has been laid down under the; historical, theoretical, conceptual and contextual frameworks, definition of terms, statement of the problem, purpose, objectives, research questions, scope and significance of the study.

Background

In the recent past, the state of higher education has been transformed and evolved. It has been transformed by a number of global and domestic forces. These amongst others, resulted into massification of higher education and the entrance of market forces in higher education delivery (Altbach, 2000). Accordingly, this demand for higher education was due, in part, to the rising population in African countries which resulted in greater numbers of pupils enrolling in basic schools and continuing to secondary schools as a response to the “Education for All” campaign, and free and compulsory basic education offered by most African states. For example, secondary enrolment increased by about 43% from 1999-2004, with about 31 million students enrolled across the African region (UNESCO, 2007).

The Economist's, 2005 (cited in Mohamedbhai, 2008), opined that the explosion was due to four main reasons, viz; the democratization of education, the rise of the knowledge economy, the phenomenon of globalization which is turning higher education into an export industry, and competition for; students, funds and research grants. This increase gave a boom and a quantitative rise to higher education such that

by the year 2000 for instance, there were at least 80 million students worldwide taught by 3.5 million professionals in various categories of higher education institutions (HEIs) (Altbach, 2000). The World Bank records also show that in the 1960s for example, the whole of Africa had only six universities mainly producing graduates for employment as civil servants and by 1983, the continent had 437,000 students. World Bank (1988 cited by NCHE, 2011) also stated that there were about 350 universities in Africa with more than half a million students by 1985.

Furthermore Baty (2009) reports that the percentage of the age cohort enrolled in tertiary education in recent times grew from 19% in 2000, to 26% in 2007; meaning that there are about 150.6 million tertiary students in the world today. In China alone, gross enrolment of the age-cohort (18–22 years) had reached 17% by 2003; indicating that China has entered the stage of mass higher education. The Economist (2011), reporting on massification trends, noted that: “The United States of America has moved further than most countries in the system of mass higher education with graduation rates in university education striking over 40% nationally by 1994. Indeed Parmley et al (2009) confirmed the American situation thus:

“U.S. higher education system is large and diverse with over 4,300 degree-granting institutions of higher education and an additional 2,200 non-degree granting institutions in which more than 18million students are enrolled.”

In France, the total number of students enrolled in universities exceeded two million in 1996 as compared with just over 1 million in 1980. Meanwhile, in Germany, all school-leavers who passed the *Abitur* (the qualifying examinations at the end of the 12 or 13 years' schooling), are in principle entitled to study the subject of their choice in the University of their choice and this more than doubled enrolment numbers in 30 years to the extent that Germany's students nowadays have to fight their way into overcrowded lecture halls and personal contact with teachers is rare" (The Economist, 2011).

In Uganda, university education has shifted from being a preserve of the elites to a service open to the masses. To date university education has become a right of all those who qualify and can afford it. This growth has culminated into a boom in university education and the resultant increase in students' enrolment, with recorded progress of only one university in the 1980's with about 10,000 students to the current number of six established public universities and 29 private recognized universities today. The total enrolment at higher institutions, i.e. universities and other tertiary institutions are now standing at over 178,000 (Ministry of Education & Sports [MoE&S], 2010). This is tremendous progress and growth in the higher education sector, noting that by 1962, Uganda was known to have had only about 500 students at Makerere University College (President Museveni's 50th Independence Anniversary Speech, 2012). The table on page 21 shows the number of universities and other institutions of higher learning in Uganda:

Table 1

Number of Universities and other Higher Institutions of Learning in Uganda by 2012

S/N	CARTEGORY OF INSTITUTION	TOTAL
1.	Public Universities	06
2.	Public University Colleges	09
3.	Public Other Degree Awarding Institutions	01
4.	Private Universities	29
5.	Private University Colleges	02
6.	Private Other Degree Awarding Institutions	01
7.	Private Tertiary Institutions	57
8.	Public Tertiary Institutions	54
TOTAL		159

Source: NCHE, 2012

In view of the above, the Ministry of Education and Sports (MoES) established a regulatory body; the National Council for Higher Education [NCHE] (2001) to set pace and advice on quality provision of education. This body thus developed the quality assurance framework for universities and other higher education institutions. The aim of the framework is to ensure that the NCHE and higher education work together to achieve and enhance the quality of higher education (NCHE, 2011).

Thus, as these universities strive to meet the increasing demand for access to higher education, they are facing a number of challenges and changes. One of the challenges is the management of “massification,” and more particularly, the management of scarce resources in the science based units in order to provide quality education and enhance quality educational outputs and outcomes.

In this research, quality teaching and learning of the practical science discipline is the main focus. The importance of science education globally cannot be under-rated because a scientifically literate population is the backbone of sustainable development (UNESCO, 2002). In the broad aims of education enshrined in the Uganda Government Education White Paper (1992), promotion of scientific, technical and cultural knowledge, skills and attitudes are emphasized as benchmarks needed for development. Such a policy was put in place to promote scientific and technological skills required for modernization and industrialization of the economy. The Ministry of Education and Sports MoES in one of its circulars to headteachers (2004), declared all core science subjects; Chemistry, Physics and Biology compulsory. In the New Vision (July, 2005), it further declared that 75% of Public Universities’ intake on Government sponsorship would be science-biased. Indeed this was implemented in the universities’ admission for 2005/2006 academic year.

Definition of terms:

Massification refers to the diversity of institutions and programmes, escalating expansion and widening of access to tertiary education and the large increase in

numbers and size of universities (Senteza, 1997). It also refers to that situation of inadequate and stagnant educational infrastructural growth and other educational resources against an increasing students' population (Mohamedbhai, 2008).

Quality benchmarks are the operational standards developed by the National Council for Higher Education under the Quality Assurance Framework for Universities and the Licensing Process for Higher Education Institutions. The aim of the framework is to ensure that the NCHE and higher education work together to achieve and enhance the quality of higher education (NCHE, 2011). The key areas of the benchmarks considered in this study were: Institutional Autonomy and Governance, Quality of Teaching and Learning, Quality of Academic Staff, Sufficiency of Educational Facilities, Research and Publications, University and the Community and Institutional Financial Management.

Management is the process of working with and through people and other resources to implement decisions and to accomplish organizational goals (Nwankwo, 1982 and Mafabi, 1992). In this study, management will be viewed: First as a process of getting activities completed efficiently and effectively with and through other people; Secondly, as a process of setting and achieving goals through the execution of the basic management functions: Planning, organizing, staffing, directing and controlling which in operational principles puts management into three components, i.e. plan, execute and measure.

Historically, Gulu University opened in October 2002 and became legally constituted under Statutory Instrument No. 16 of 2003. The University opened with about 240 students, 60 Permanent Lecturers and 20 Part-time Lecturers. By the 2006/07 academic year, the students' population had risen to 2,574 with an academic staff population of about 150. To date, the University has grown to about 4,000 students offering 35 programmes at Certificate, Diploma, Bachelor, postgraduate Diplomas, Masters degrees and PhD levels and taught by near to 250 academic staff (Gulu University News Letter, 2008). In the Department of Human Anatomy, student enrolment rose from 62 in 2004/5 academic year to 82 in the 2011/12 academic year. In the Department of Computer Science, enrolment rose from 19 in 2005/6 academic year to 175 in 2011/12 academic year. See table on page 25. The status quo expressed in these departments however, seems to suggest that the rise in students' enrolments which do not adequately correspond to the available educational resources; infrastructure, teaching and learning equipment, library resources as well as the required academic staff draw the departments to a situation of unplanned enrolment, high students' to equipment ratios, as well as a high students' to lecturers' ratios, which in essence defines massification.

Table 2

Students' Enrolment Records in the Department of Human Anatomy, Computer Science and Bio-systems Engineering 2004/05 AY 2011/12 AY

Academic Year	HA	Gender	Computer Science					Gender	Bio-system Eng.	Gender
			Dip. CS	Gender	B. CS	Gender	B. IT			
2004/5	62	M 58 F 04								
2005/6	59	M 49 F 10			19	M 17 F 02				
2006/7	61	M 47 F 14			49	M 48 F 01	62	M 41 F 21		
2007/8	70	M 56 F 14	15	M 12 F 03	33	M 32 F 01	59	M 41 F 18		
2008/9	70	M 54 F 16	15	M 11 F 04	20	M 15 F 05	80	M 58 F 22	21	M 17 F 04
2009/10	62	M 44 F 18	27	M 22 F 05	16	M 13 F 03	81	M 61 F 20	15	M 12 F 03
2010/11	82	M 67 F 15	26	M 18 F 08	19	M 17 F 02	71	M 49 F 22	23	M 21 F 02
2011/12	85	M 71 F 14	28	M 18 F 10	16	M 14 F 02	131	M 94 F 37	19	M 16 F 03

Source: Faculty Enrolment Records

Key: HA (Human Anatomy); Dip. CS (Diploma Computer);
B. Cs (Science Bachelor Computer Science)
B.IT (Bachelor Information Technology); M (Male); F (Female)

It is however presumed that, if this quantitative increase has not been matched by a corresponding increase in physical and educational facilities or human and financial resources, then it becomes detrimental to the provision of quality education. The NCHE (2011) while addressing itself to the issue of rapid expansion stated thus:

“The increase in enrolment has created many problems; foremost among them is a drop in quality. In many institutions, staff qualifications and experiences are declining. There is little money for educational inputs. Study areas are overcrowded because of a mismatch between student numbers and facilities...there is little money for the maintenance of the infrastructure and few institutions have comprehensive internal quality assurance mechanism.”

Theoretically, massification in education can best be understood through the human capital theory developed by Schultz (1961) where education is looked at more as an investment for the individual and the society rather than as consumptive. Within this climate of opinion, universities began to be perceived as prerequisite for the success of nations and increasingly, of regions and cities thus blowing up investment into the sub-sector as well as the enrolment rates. Harvey and Green (1993), while underpinning their views on the phenomenon of massification, postulated that surging numbers in enrolment has a big impact on quality and standards due to overcrowding, as it results to pressure on staff, student ratio and equipment, library resources and space. Secondly, it is evidenced through earlier researches done that, quality and standards are diluted due to high intake and this was articulated in the idea that “more means worse.”

Conceptually, massification can have both a positive and a negative connotation. One could say that massification could have a positive impact on an

institution first, if it is planned and secondly, if there are adequate physical, human and financial resources to cope with the rapid increasing students' enrolments. On the other hand, massification could have a negative impact when an institution does not have sufficient educational resources, human as well as financial resources to cater for the increased enrolment (Mohamedbhai, 2008). This state of affairs inevitably may have a direct bearing on the quality of education offered.

Quality is multifaceted and a complex concept. Ball (1985) likens it to 'freedom' or 'justice', which are elusive concepts. Hawes and Stephen (1990), however, look at it as having three strands; efficiency, relevance and excellence for human betterment. In the words of Sallis (1996), he asserted that: "we all know quality when we experience it, but describing and explaining it is a more difficult task." Mosha (2000) defines quality as the level of excellence in educational performance. The World Declaration on Education for All (EFA), in 1990, identified quality as a pre-requisite for achieving the fundamental goal of equity. Beeby (1966) cited in Edqual (2006), in his landmark text, *'The Quality of Education in Developing Countries'*, conceptualized quality as judged at three levels; first, classroom quality, secondly as a construct for community expectations and thirdly as a framework for broader social criteria. While UNESCO's vision for a global education, addresses four pillars of a quality education: learning to know, learning to do, learning to be and learning to live together. Adams, UNESCO, Daniel and Kanwar, Juran and Godfrey (cited in Nhundu, 2008), respectively view quality as synonymous with efficiency, effectiveness and equity and that quality be defined in terms of "Fitness for the purpose at minimum cost to society". The

exponents of this view argue that quality has no meaning except in relation to the purpose of the product or service offered. Emphatically, the notion addresses the democratic meaning of quality in the university context, where each institution decides on its vision and mission and is then assessed accordingly (SAUVCA's, 2002).

Universities in the world all expressed different visions, missions, goals and all attempt to achieve their specific core values. The vision of Gulu University emphasizes promotion of rural transformation and industrialization for sustainable development, while the mission targets; improve access, provision of quality professional training, delivery of appropriate social services and the promotion of research. The extent to which the implementation of NCHE benchmarks supports the vision and mission of the university in managing massification in science-based faculties was very core in the study.

Contextually, higher education world over, has experienced escalating numbers or widening of access, but reduced funding in general. As a result, resources that are made available to support rapid growth in higher education, including governance, equipment, buildings, staffing and staff time, staff benefits and students' welfare are not adequate to maintain the quality of programmes and student learning experience. However, it is believed that given the right management interventions, challenges of massification can be addressed.

Statement of the problem

Gulu University, like any other institution of higher learning in Uganda, has experienced rapid growth in students' numbers over the years. These escalating numbers and sometimes unplanned progress seem to impact negatively on the teaching and learning of science disciplines at the University. Massification, which is the imbalance between students' numbers, the availability of education resources, and unplanned programmes' development (Mohamedbhai, 2008), may compromise provision of quality education.

The situation in the science-based departments at Gulu University seems to depict that the growths in educational facilities or other educational resources is not commensurate to the growth in students' numbers. This situation results into a stressful learning condition for both the lecturers and learners.

This study was thus carried out to investigate the extent to which the National Council for Higher Education quality benchmarks are applied in the management of massification in the science-based faculties at Gulu University with an overall view of improving educational standards.

Purpose

This study investigated the use of the NCHE quality benchmarks in the management of massification in science-based faculties at Gulu University.

Objectives

The objectives of the study were:

1. To establish the extent to which massification is experienced in the science-based faculties at Gulu University,
2. To appraise the influence of university autonomy and governance on the management of massification in science-based faculties at Gulu University,
3. To explore the influence of efficient and effective teaching and learning on management of massification in science-based faculties at Gulu University,
4. To examine the impact of research, publications and community service on the management of massification in the science-based faculties at Gulu University,
5. To assess the influence of quality institutional financial management on management of massification in the science-based faculties at Gulu University.

Scope

The study was conducted at Gulu University. Gulu University was selected because of its most recent history in higher education. It is one of the fastest growing public universities in Uganda with up to about 4000 students in only ten years. The study examined various quality benchmarks developed by NCHE (Uganda) to monitor and regulate quality in Uganda's universities with specific emphasis on how the benchmarks have been utilised to manage the massification process in the science-based faculties at Gulu University.

Specifically, seven areas in the NCHE framework were addressed in this study: Institutional autonomy and governance, the quality of teaching and learning, the quality of academic staff, sufficiency of educational facilities, research and publications, financial management and the university and community. The study was specifically conducted in the faculties of Agriculture, Medicine and Science in the departments of Bio-system Engineering, Human Anatomy and Computer Science respectively.

The choice of the research problem was shaped by the broad aims of education enshrined in the Uganda Government Education White Paper (1992) which emphasized promotion of scientific and technical skills as quality benchmarks needed for development. Secondly, it was clear that there was a mis-match between students' enrolment and the available educational resources and facilities, resulting into amongst others; taking students of Gulu University to do science practicals in other universities or training institutions.

Gulu University is located in Laroo Division, Gulu Municipality approximately 3 km by road NE of Gulu town, at the former Gulu District Farm Institute, Northern Uganda and approximately 320 km by road north of Kampala, Uganda's capital city. The study covered the period from August 2004 to March 2012. The justification for the time scope was basically to measure the growth of students' numbers over time and tally it with growth in other education resources and facilities to determine whether the institution is experiencing massification or not.

Significance

Theoretically it is assumed that ills of massification impair provision of quality education. However, it is envisaged that by this study, managers and academicians at University level may develop management strategies to enable them address the challenges posed by massification and set pace towards the enhancement and provision of quality education.

It is also hoped that the University leaders may be able to develop management skills and strategies that will allow them reap from the opportunities created by massification. The NCHE which is the regulatory authority may hopefully benefit from the study by establishing how much her policy framework is in use to higher education institutions, and possibly guide her toward shaping a monitoring and evaluation strategy.

Customers of higher education may hopefully be guided in their partnership with Universities and more especially on what emphasis to lay during the management of internships and choices of their employees. Graduate students, will definitely benefit from the study and use it as resource material and a platform for further research.

Lastly, universities are held in high regards by local communities, researchers, business people, civil servants as well as politicians. Universities influence society. Skilled manpower is provided by universities; therefore, continuous checking of quality standards through a scientific research like this one is worthwhile, so that universities ever remain centres of excellence and research.

Chapter Two: Review of Related Literature

Introduction

This chapter examined review of related literature that guided and supported debate on the extent to which the NCHE quality benchmarks guide the massification processes in Science-based Faculties at Gulu University. The review adopted the following format: The theoretical framework, conceptual framework and literature presentation under the following headings: Massification in Higher Education, Institutional Autonomy and Governance at Higher Education Level, Quality of Teaching and Learning at Higher Education Level, Quality of Educational Resources, Quality of Academic Staff, Research, Publications and Community Service at Higher Education Level and Institutional Financial Management at Higher Education.

Theoretical Framework

In this work, the “Human Capital Theory” was identified as most suitable to explain the concept “massification” in higher education. The theory is based upon the work of Schultz (1961), Sakamota and Powers (1995), Psacharopoulos and Woodhall (1997) which rests on the assumption that formal education is highly instrumental and even necessary to improve production capacity of the population. The main point of the theory is that, education rather than being looked upon exclusively as consumption should be looked upon as an investment for the individual as well as for society. In short, the human capital theorists argue that an educated population is a productive population. Because of this therefore, there has been a general understanding that knowledge-intensive production is crucial for employment and welfare while

knowledge-based production is dependent on a highly educated work force. The creation of an adequate supply of well educated persons for the future therefore became the focus, together with the attention to immediate demands, therefore raising the demand for education at all levels including higher education and consequently increasing influx into the sub-sector, resulting into blowing-up of the investment cost of education.

Significance of the Human Capital Theory

According to Babalola (2003) cited by Olaniyan and Okemakinde (2008), the rationale behind investment in human capital is based on three arguments: First that the new generation must be given the appropriate parts of the knowledge which has already been accumulated by the previous generation, second that the new generation should be taught how existing knowledge should be used to develop new products, to introduce new processes and the production methods and social services and thirdly, that people must be encouraged to develop entirely new ideas, products, processes and methods through creative approaches. Similarly, Fagerlind and Saha (1997) cited by Olaniyan and Okemakinde (2008), underscore that the human capital theory appeal was based upon the presumed economic return of investment in education both at the macro and micro levels. They noted that efforts to promote investment in human capital were seen to result in rapid economic growth for society and for individuals; such investment was seen to provide returns in the form of individual economic success and achievement.

Furthermore, according to Robert's (1991) model, education and the creation of human capital was responsible for both the differences in labour productivity and differences in overall levels of technology that are observed in the world. He notes that more than anything else, it has been the spectacular growth in East Asia that has given education and human capital their current popularity in the field of economic growth and development. Smith (1976) did not only view the human capital concept in terms of economic growth and development, but also as a critical input for innovations, research and development. From this perspective, he viewed education as an intentional effort to increase the resources needed for creating new ideas, and thus, any increase in education will directly accelerate technological progress.

Schumpeter's (1973) postulation pointed to the direction that education is seen as an input into the intentional and entrepreneurial efforts to create new technology and new products. Van-Den-Berg (2001) further argued that, countries that are at the forefront of technology also have the most educated population. Deriving from these various postulations therefore, it becomes valid to conclude that investment in education invariably affects development to the extent that all individuals and nations would wish to be associated with it, thus creating an influx into the sub-sector and equally increasing the investment cost.

Limitations of the Human Capital Theory

The core thesis of human capital theory is that peoples' learning capacities are

comparable to other natural resources involved in the production process, when the resource is effectively exploited the results are profitable both for the enterprise and for society as a whole. This assumption was held as late as the 1960s. Since the 1970s, however, the applicability of the theory's claims for returns to schooling has been thrown into doubt (Livingstone, 1997). He cited many reasons amongst which are that: First, school enrolment rates have continued to increase while average incomes have stagnated, unemployment rates have worsened and the underemployment of highly schooled has been recognized as a social problem; Secondly, some human capital advocates suggest that these great increases in learning efforts have not led to commensurate economic gains because of the declining quality of education. Thirdly, it is evidenced through earlier researches done that, quality and standards are diluted due to high intake and this was articulated in the idea that "more means worse"; Fourth, some exponents of human capital revisionist like Reich and Senge (Livingstone, 1997) argue that informal work-related learning have taken centre stage to aspects of learning previously ignored or taken for granted by human capital theory's fixation on schooling and credentialed knowledge to the extent that most adults now believe that informal learning is essential to master a new job; lastly, that the biggest challenge to human capital theory is taken to be the underemployment of credentialed knowledge. It is believed that a growing proportion of people who have invested many years of their lives in acquiring advanced formal education qualifications are unable to obtain commensurate jobs and are thus disassociating from the theory's main emphasis.

The human capital theory relates well to this study because it informs managers of higher education that the increasing numbers in higher education if properly planned and well managed can be tapped into a huge investment for the nation's development. In this study the framework provided in the NCHE quality benchmarks becomes a launch-pad to guide success in these endeavours. Conversely if massification is not controlled, then the ultimate outcomes are nasty and destructive to quality attainment which in the long run will lead to non profitable results because the outputs (graduates) will not be competent enough to produce the outcomes expected of them, thus discouraging customers of higher education to invest in the sub-sector.

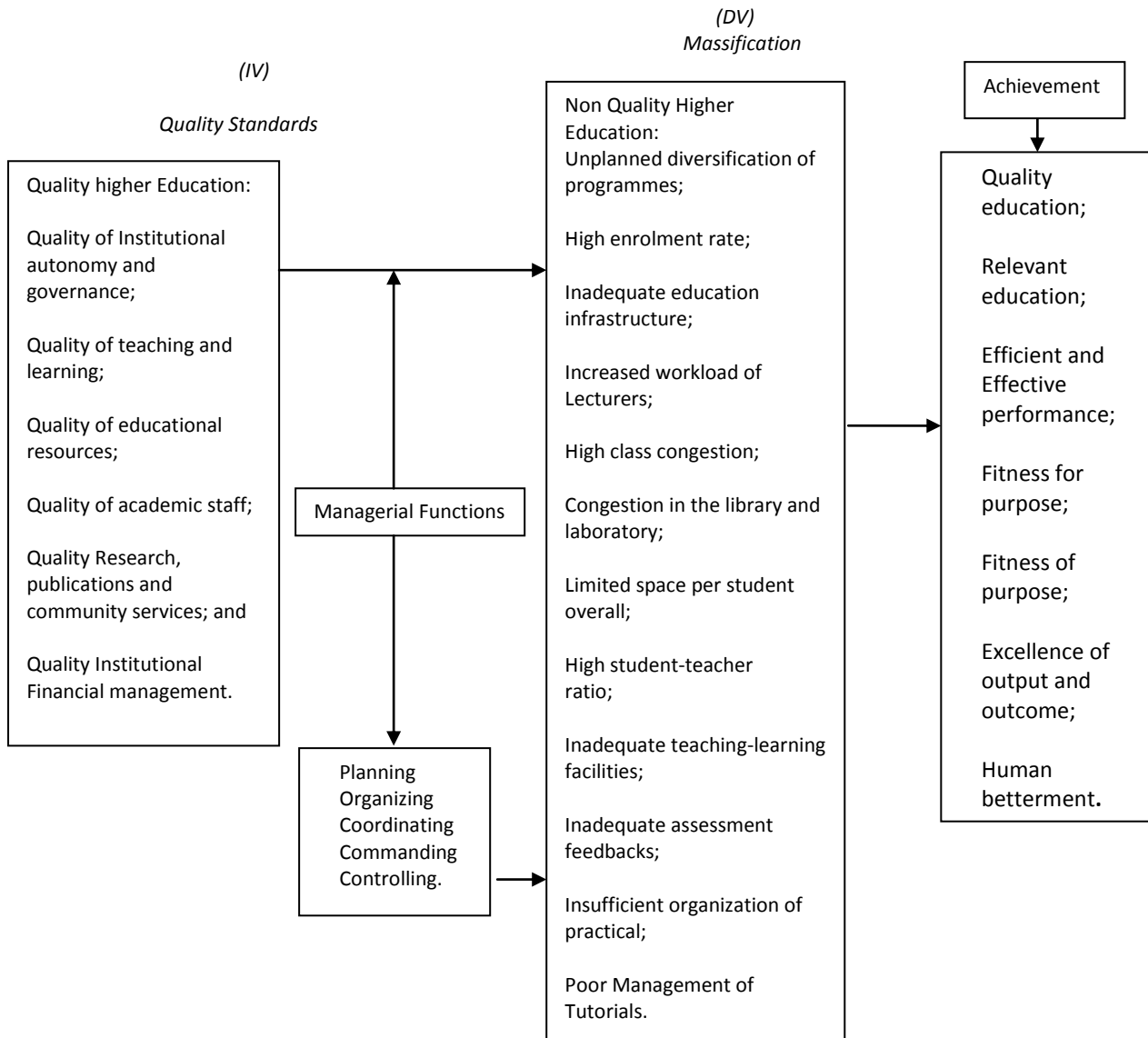
The Conceptual Framework

This section presents a conceptual framework within which the concept of massification is explained in this work. In brief massification refers to the diversity of institutions and programmes, escalating expansion and widening of access to tertiary education and the large increase in numbers and size of universities (Senteza, 1997), or that situation of inadequate and stagnant educational infrastructural growth and other educational resources against an increasing students' population (Mohamedbhai, 2008). In this framework, massification is presented to have both positive and negative consequences. Massification is positive for an institution if the institution has adequate physical, human and financial resources to cope with the rapid increase in enrolment and diversity of programmes and to produce quality outputs and outcomes. On the other hand, massification is negative when an institution does not possess sufficient educa-

tion resources to cater for the increased enrolment (Mohamedbhai, 2008). This state of affairs inevitably will have a direct bearing on the quality of education offered as well as on the output and outcomes of the graduates.

The conceptual model in figure 1 below explains the relationship between some quality standards stipulated by the NCHE and the management of massification. In the model, key quality attributes were identified, amongst which are: institutional autonomy and governance, quality of teaching and learning, quality of educational resources, quality of academic staff, quality of research, publications and community services and appropriate institutional financial management which also constitute the independent variable of the study and opined that if these key variables are upheld and sustained then the achievement of quality education become realized. On the other hand it is assumed that the ills of massification which result into non quality higher education, amongst which are: unplanned diversification of programs, high enrolment rate, inadequate education resources and infrastructure, high student-teacher ratio, just to mention a few, can equally achieve quality standards through the application of educational leadership practices enshrined in the core managerial functions:- planning, organizing, coordinating, commanding and controlling.

The constructed Conceptual Framework



Source: *Researcher's Analogy*

Figure 1. The relationship between the NCHE Quality benchmarks and management of massification in Science-based Department

Key: IV- Independent Variables; DV-Dependent Variables; IV-Intervening Variables

Concept of massification in higher education

Rapid increase in students' enrolment has been a global phenomenon in the past twenty years (Visitation Committee Public Universities, 2006). Higher education is no longer a preserve of the leadership elite. It is becoming the right of the masses. In Uganda the students' numbers in higher education have grown from 10,000 in the 1980s to 124,133 in 2005. According to Visitation Committee on Public Universities (VCPU) (2006) report, this unplanned rapid increase in student numbers and diversification of programs (massification) have not been matched by a corresponding increase in physical and educational facilities or human and financial resources... to the detriment of quality education provision.

Massification refers to the diversity of institutions and programmes, escalating expansion and widening of access to tertiary education and the large increase in numbers and size of universities (Senteza, 1997). It also refers to that situation of inadequate and stagnant educational infrastructural growth and other educational resources against an increasing students' population ((Mohamedbhai, 2008). In the broad aims of education enshrined in the Uganda Government Education White Paper (1992), promotion of scientific, technical and cultural knowledge, skills and attitudes are emphasized as benchmarks needed for development. Such a policy was put in place to promote scientific and technological skills required for modernization and industrialization of the economy. The Ministry of Education and Sports (MoES), in one of its circulars to headteachers (2004), declared all core science subjects; Chemistry, Physics and Biology compulsory. It also declared that 75% of public universities intake on

Government sponsorship would be science-biased. Indeed this was implemented in the admission for 2005/2006 academic year intake and tremendously increased enrolment in science at university level (MoES, 2005).

Ministry of Education and Sports (MoES) (2005), characterizes quality education as education that is; efficient in its use of available resources, effective in meeting locally and nationally agreed goals, relevant to the needs, rights and expectations of learners, the community and the society at large; and accessible to all. This postulation agreed with Shaeffer's (1992) when he stated that quality education necessitates addressing the four educational elements; inputs, process, output and outcome. However, amidst the challenges of high enrolment, underfunding, inadequate staff and the shortage of science equipment and the general use of available resources for teaching and learning attainment of quality becomes far-fetched.

In a research carried out by the Federal Ministry of Education in Abuja, Nigeria (Education Status Report, 2005) on the status of education in that country, it was observed that overpopulated classrooms are considered to be un conducive for both teachers and students when it comes to the issue of continuous assessment marking and the ability to give individualized attention to students needing extra help and vice versa. Furthermore, Onwo (1998) contends that class size is a big factor in determining the attainment of educational goals and objectives. UNESCO (2000) recommends that students' population in a single classroom should not exceed 1:30, or at most 1:35 in order to foster provision of quality teaching and learning. Edge (1980) in his study on

teaching writing skills reported that in large classes, the provision of an opportunity for discussion or any kind of oral input to the written work is difficult. Powell (1969) observed that, large numbers of students in a class allow almost no opportunity for genuine exchange of opinions or arguments. In the Education Government White Paper (1992) the recommended teacher-student ratio should be 1:45 to enable efficient and effective teacher-learners interactions. Class enrolment that so far goes beyond that recommended number outside any other policy position is thus considered high.

In conclusion to this caption, it is important to state that these earlier studies and recommendations carried out in other countries and levels of education on massification, are the basis on which the science-based faculties at Gulu University can draw up management strategies that can be appropriately used in mitigating massification and all its consequences.

Institutional Autonomy and Governance at University Level

Higher education is under pressure to change. It is growing fast and its contribution to economic success is seen as vital (OCED, 2003). Universities and other institutions of higher learning are complex organisations which serve a multiplicity of purposes in form of goals and objectives. They are expected to create knowledge through teaching, do research, improve equity, and to respond to student needs and to do so much more efficiently. Competing for students, research funds and academic staff have become some of the daunting challenges in the attainment of their missions,

visions and goals both nationally and internationally. As it does these, universities must satisfy their stakeholders' demand. University stakeholders include students, parents, and faculty (academic staff) and members of non academic staff, the business community, peasants, donors and the government. In an attempt to try and address these expectations, institutional autonomy and governance which are components within a university management structure take centre stage.

Autonomy applied to university, concerns itself with the relative ability of an institution to govern itself without outside control. Autonomy can be granted by law or through the financing system. The relationship is delicate and in discussing it, a distinction must be made between 'dependency' and 'intervention' (Husén, 1991). According to Goedegbuure (1993), the power of the university or college to determine its own goals and programmes is substantive autonomy, while procedural autonomy is the power of the university or college to determine the means by which its goals and programmes will be pursued. The extent to which this is experienced is determined by a number of factors and may vary across regions. Karr (1987) states that, the authority pattern of a university lacks a well-defined chain of command, what exists explains a collegial partnership between the Vice Chancellor and faculty members. Tagg and Howell (2005) and Baldrige et al (1978), cited by Ssettumba, describe universities as "organised anarchies and loosely coupled".

In the Organization for Economic Cooperation and Development (OECD)

countries, university autonomy and governance are determined across eight areas:- ownership of building and equipment, borrowing of funds, expenditure of budgets to achieve objectives, setting of the academic structure/course content, employment and dismissal of staff, setting of salaries, deciding on students' enrolment and determining of tuition fees (OECD, 2003). In Uganda, this corporate responsibility has been highlighted in the Quality Assurance Framework for Universities in Uganda and they emphasized the following themes: Admissions and dismissal of students, hire and fire of staff, design and implementation of curricula, setting and charging of fees, setting and marking examinations, award qualifications and propose and implement the university's budget (NCHE, 2006 No. 7).

Governance in the context of university education on the other hand, deals more with the crucial and critical role higher education plays today, not only in the promotion of democratic culture and institutions, but also in transforming the world into a global institution (OECD, 2003). Collis (2004), defined governance in higher education as "the structure and process of decision making" and "the establishment of policies to guide (the work of the institution) as opposed to the daily management and administration of the institution. This is a complex and demanding mission which only does not involve manipulation of the legislative framework, the characteristics of the institutions and how they relate to the whole system, but also how money is allocated to institutions and how they are accountable for the way it is spent, as well as less formal structures and relationships which steer and influence behaviour. In the context of this study, good governance would inform quality education, guide the achievement

of fitness of purpose and fitness for purpose as well as determine institution's output and outcomes.

Eurydice (2008) emphasizes that the governance structure of an institution tells how stakeholders, including; the executive head of the institution, staff, students, parents, governments, laypersons, etc. communicate with each other; who is accountable to whom, how they are held accountable and for what, etc. In many countries of the world, higher education is still viewed primarily as a part of the public sector. Governments have a predominant role, either directly providing (as in France) or purchasing or ordering services (as in Sweden). This is true even in countries like the United States where universities have long history of being entrepreneurial and seeking funds from a variety of sources (OECD, 2003). In African states, governments' roles in university governance still remain central. In Uganda the University and Other tertiary Institution Act is the legal framework on which governance of higher education hinge.

The NCHE (2006, p. 18) heightens that well-governed institutions of higher education have strong "institutionalism" with functioning structures like University Council, Senate, Faculties, Departments and Unions whose powers, or limits of it, are well defined. A well-governed institution does not only depend on the charisma or the strength of the leaders. It depends, above all, on its own institutional strengths embedded in its structures, traditions, rules, achievements and viability (NCHE, 2006, p.19). This is to underscore the fact that the traditional model which constitutes governance at higher education is broadly collegial and consultative. In view of the

foregone therefore, universities around the world have tried to position themselves around their major themes and address development needs as well as market situations in their own regions and answer global expectations guided by regional quality standard or frameworks.

In the commonwealth countries for instance, most governments since the late 1970's have promoted a climate of critical self-assessment within their higher education sectors. This focus was extended to include the improvement of efficiency and effectiveness and an increased awareness of public accountability. This means therefore, that there is great need for our universities to appreciate self-assessment, general appraisal and evaluation within the universities. The United Kingdom's and the European Union's perspective hinge so much on the Sorbonne and Bologna declarations (UNESCO,2004) which targets to ensure that European higher education is competitive internationally, with clear objectives aimed at increasing mobility and employability of European cultural diversity and therefore also respecting the diversity of higher education. In South Africa, the work of the Higher Education Quality Committee (HEQC) of the Council on Higher Education (CHE) has to provide judgement for the efficient and effective management of quality in their universities (Singh, 2004).

In Uganda, the National Council for Higher Education (NCHE) was instituted in 2001 under the Ministry of Education and Sports (MoE&S), its mandates amongst others were: to provide regulatory measures, provide checks and balances and

maintained standards (MoE&S, 2005). The Council developed the Quality Assurance Framework for Uganda Universities (NCHE, 2006) with its main focus addressing the following related themes: Institutional governance, quality of teaching and learning, quality of academic staff, sufficiency of educational facilities, research and publications, the quality of inputs and outputs and institutional financial management.

Quality Management of Teaching and Learning at Higher Education Level

In higher education and in education generally, the quality of teaching and learning is paramount. In this research, quality teaching and learning of practical science discipline is the main focus. Teaching and learning are key elements of any education system without which there is no legitimacy for any educational institution. This notion is even more prominent today where higher education is not only viewed as an avenue to create knowledge, but also as a business-like enterprise. The customers range from government that calls for greater accountability of public expenditure, to employers who want to know what they are getting, to the students who, quite rightly are increasingly more demanding of institutions (Diana, 1994). The importance of science education globally cannot be under-rated because a scientifically literate population is the backbone of sustainable development (UNESCO, 2002). The importance of science in Australia prompted the Australian academics of science to take action to raise awareness of the issues. According to the Consortium for Policy Research in Education (CPRE, 2005), the Institute of Physics, the Royal Australian Chemical Institute, the Institute of Engineers of Australia and Australian Mathematical Science Council joined forces in 2002 to ensure that the importance of sciences was disseminat-

ed to all. The importance of science also prompted the Merck Institute for science education to enter into partnership initiative with the school districts of Linden, Rahway and Readington in New Jersey and the North Pen in Pennsylvania, (University of Pennsylvania) USA. This was intended to strengthen elementary and middle school science education and raise the levels of students' participation and performance in science. It also wanted to provide all children with strong inquiry-centred instruction that met the emerging national standards in science.

Quality management of teaching and learning therefore becomes critical. The students as a (Consumer) seeks a business-like relationship with the producer (Lecturer) that delivers knowledge, skills and competencies he/she wants (Newton, 2002). Lecturer-students relationship is viewed as a helping hand in which the student perceives that the Lecturer has his/her best interest at heart. Teaching and learning are processes through which educational objectives and goals are achieved. They serve the aims of education, which amongst others is acquisition of knowledge, skills, habits, values or attitude (World Book Inc, 1994), which should cause an enduring change.

According to Shaeffer (1992), quality in education has traditionally been defined in terms of inputs, outputs and processes. Inputs including materials; class building, desks, chalkboards, textbooks, laboratory equipment as well as teachers and students whose quality is often measured in terms of qualification of teachers, text books

relevance and students' intellectual and nutritional status. Outputs on the other hand include; proxies of achievement (i.e. promotion and completion rates) and measures of actual achievement such as the kind and quantity of facts and skills learned. More recently, Shaeffer (1992), viewed quality in terms of proper organisation of a lesson/lecture, the correct use of texts and home work/assignment, the encouragement of child-centred learning, the absolute amount of time spent on tasks and so on. Again while addressing itself on methods of teaching and assessment, the Visitation Committee (2006) clearly expresses regrets that most lecturers in our universities are still using old and traditional teaching methods – talk and chalk lectures, tutorial/seminars and demonstrations in labs, workshops and in the field...these teaching methods are more teacher-based than student-based and they tend to develop students' memorization rather than their analytical and problem-solving skills. In the study the researcher intended to find out how the input, output and process conditions; (class building, lecture chairs, whiteboards, chalkboard, textbooks, laboratory equipment, teachers and students quality, text books relevance, organisation of lectures, use of child-centred approach in teaching, the absolute amount of time spent on a task as well as the use of ICT) in the teaching-learning conditions at Gulu University in the selected departments are applied to manage massification.

The NCHE whose mandates amongst others is to; regulate and guide the establishment and management of institutions of higher learning and regulate the quality, equate qualifications and advise government on higher education issues,

provided a checklist under schedule 4 of the statutory instrument No. 8 of 2005 Checklist for Quality and Institution Capacity Indicators for Assessment of University Institutions and Programmes under the Universities and Other Tertiary Institutions Act 2001, to which university quality assurance should adhere (NCHE, 2006). This framework is both formative and summative and goes through a range of issues; institutional audit, institutional governance, quality of teaching and learning, quality of academic staff, sufficiency of educational facilities, research and publications, quality of outputs, institutional financial management and the university and community (NCHE, 2006).

Quality management of teaching and learning will thus be viewed: First as a process of getting activities completed efficiently and effectively with and through other people; secondly as a process of setting and achieving goals through the execution of the basic management functions; planning, organizing, staffing, directing and controlling which in operational principles puts management into three components (plan, execute and measure). The implementation of these management strategies are guided through a number of legal frameworks and policies, viz: the University and Other Tertiary Institutions Act, the Semester and credit system regulations, the programme guidelines as well as the assessment regulations which should inform the conduct of the teaching-learning process.

According to the theory of classical conditioning by Skinner (1974), teaching and

learning is a function that should cause a change in overt behaviour. It further explains that changes in behaviour are results of an individual's response to events (stimuli) that occur in the environment and that a response produces a consequence such as defining a word, explaining a case, hitting a ball or solving a problem. However, what has been noted today is that quality management of teaching and learning appears a far-fetched reality in the state of higher education in Uganda due to the challenges posed by massification. The Monitor News Paper of Saturday, November 28, 2009, reported that; 'the public nowadays view many of our universities as "glorified high schools" in which students learn little and do not contribute an iota of new knowledge...that a number of university graduates are failing to impress at the work places and cannot write or speak correct English and yet this is the time when university education is at its most expensive'. Sunal, W. D et al (2007) study reports that;

"traditional pedagogical approaches of instructors in undergraduate introductory science courses do not work effectively with many of today's students...helping students understand ideas is a complex task. Doing it well takes a significant amount of instructors' knowledge and skills...science faculty have little, if any, professional training in teaching."

According to CDT Link (2001) whose emphasis was on the teaching of physics, noted that; a new approach to teaching practical physics was proposed whereby the new method centres on a 45-minute discussion held prior to each practical session during which students are encouraged to explore various ideas and make use of common place knowledge towards planning for a proposed experiment. It further

postulates that the traditional physics practical often failed to motivate and challenge students to learn science by discovery. On the same note, it was discovered that teaching chemistry by guided inquiry was simple! It gave more time to prepare labs and more time to help students. "There will be more time to prepare other lessons and demonstrations. And none of this extra time will be at the expense of your students ...your students will learn more effectively and become more successful, (http://www.chemistryinquiry.com/about_chemistry_guided_inquiry.htm). What this means is that, the professors at university level should be trained and imbued with more skills in the field of pedagogy, andragogy and synagogy, so that they become all-round and innovative and more especially in the management of teaching and learning, against an increasing students' numbers, but reduced educational resources overall.

In B-HERT NEWS (2003), renowned educationists had the following to comment about the importance of teaching and learning at university education. Here are excerpts:

According to Prof. M. Craig (2003), Centre for the Study of Higher Education in the University of Melbourne, the importance of teaching and learning in universities has shifted from routine and somewhat token acknowledgment in government policy to a central place in the higher education policy agenda. To him, students are now more likely to study in multiple settings: in large lecture theatres, in groups on collaborative exercises, in computer laboratories with two or three others in an online tutorial, or simply working at home alone. Whereas it may be true that these learning

strategies help to improve quality teaching and learning, it is important to observe that their implementation remain wanting in most higher institutions and should be re-enforced, consolidated and tailored especially in the management of massification in the science-based disciplines.

Professor Richard. D (2001) of the University of Oxford, however, thinks that the Oxford Tutorial is better than any alternative offer, because it emphasises the virtues of individual attention, and the one-to-one focus on learners. Mr Robin Lane Fox, Fellow in Ancient History new College, Oxford and admirer of the Socratic Method also think that the Oxford tutorial system is the best because it brings one or two learners into contact with a single teacher in their subject and provide them an opportunity to think together. The Oxford tutorial system also received a positive applaud from the students, thus: “tutorials continue to play a prominent part in the life of any student at Oxford and there is no doubt that they think about them a great deal, how they work (and sometimes do not work) as a way of learning and teaching.” The learners further commented that there is a danger that with the decline of one-on-one teaching, the opportunity to offer the kind of detailed, in-depth advice to an individual that was always a distinctive feature of the traditional tutorial is lost.

Professor Bain. K. (2004) of History and Director, Centre for Teaching Excellence, New York University, had this to say: “The best teachers conceived of

teaching as anything they might do to foster sustained and substantial changes in the way students think, act, or feel without doing major harm...one can't teach well by the numbers anymore than one can expect to become a great artist by painting in that fashion. Excellence in teaching requires deep thoughts and often profound and subtle changes in the way we think about the nature of both teaching and learning."

On the part of the Learners, many factors shape the quality of learning. These include the aptitude and motivation of individual Students and their own approaches to learning (including collaborative learning), the quality and diversity of the student body of which they are part, the curriculum they study, the calibre and strategies of those who teach them, the size and nature of their classes, the ways in which learning is encouraged by assessment processes and feedback, the learning resources (such as libraries, laboratories, and information technology) available and used, the scope for learning in the classroom to be enriched by learning outside the classroom (including in residential and extra-curricular settings), and the wider institutional and social context.

According to Biggs (2003) reviewed by Paulo and Bota (2004), quality of teaching in higher education relies upon what Students do both in and outside the classroom. He claims that at last a shift has occurred in the focus of teaching and learning from what Teachers do to what Students do in the classroom in higher education. He argued that this shifting is liberating. The main theme of his book is that the quality of teaching can be enhanced by aligning objectives, teaching styles and assessment tasks.

Cognizant of the aforesaid therefore, and whereas some of these studies were carried out at lower levels of education rather than at higher education, and conscious that in higher education, approaches to learning are multivariate and augmented with tutorials, research, library work and outreach services, the general consensus seems to point to the fact that teaching and learning remain core functions in the education setting to which keen attention must be placed. To surmount the challenges therefore, managers of education at all levels and especially at higher education must attempt to draw some operational strategies and more especially in the management of massification which is turning into a new challenge that needs to be addressed if attainment of quality education has to be realized in line with expectations of the NCHE standard parameters.

Quality Management of Educational Resources

Many researches done on the status of higher education in sub-Saharan Africa reveal that many governments are unable or unwilling to make appropriate resource commitments that are proportionate to student numbers (Edqual, 2005). As a result, resources that are made available to support rapid growth in higher education, including equipment, buildings, staffing and staff time and benefits, are not adequate to maintain the quality of programmes and student-learning experience. This is severely undermining the commitment demanded of higher education institutions to produce highly skilled, mobile, and globally competitive workforce that is able to adjust to a rapidly globalising world economy.

As much as the above notion is plausible, it must however, be noted that the inability of governments to support higher education appropriately should not be made perpetual. Instead managers of higher education should continually plan with government on how to address the salient issues with respect to students' enrolment, acquisition of educational facilities and development of the infrastructure. Baty (2009) in his research reports accentuated that, the percentage of the age cohort enrolled in tertiary education has grown from 19% in 2000, to 26% in 2007, meaning that there are about 150.6 million tertiary students in the world today who require attention from their governments or sponsors.

The Visitation Committee Report on Public Universities in Uganda (2006) noted with regrets that the state of facilities in all our public universities are either broken down owing to lack of repairs and maintenance, short in supply, out-dated or the laboratories are too small to accommodate the ever increasing numbers. It further noted that the increase in Students' numbers has not been matched by a corresponding increase in physical and educational facilities or human and financial resources...to the detriment of quality education provision. The committee was emphatic to observe that for any modern university to deliver quality education, it must have adequate educational resources including books, journals, scholastic materials, computers, including internet access, laboratories and workshops, and opportunities for field work and industrial attachments. The accentuation of the Visitation Committee about the availability of adequate educational resources in a teaching-learning situation is paramount. However, it must be strongly argued that their

acquisition or procurement must correspond to class enrolment status or plan so that the equipment-student ratio specifications may provide opportunity for efficient and effective hands on experience amongst the Learners as well as avert massification crop-in.

According to Kulazikulabe (1978), institutions sometimes lack even the minimum of required educational materials of all types. Where they exist, they are insufficient or even sub-standard. Section 5 (1) of the University and Other Tertiary Institutions Act (2003) stipulates that all courses and programmes must be taught by sufficient and qualified staff using adequate education facilities in safe and accessible physical structures. The NCHE requirements set out in Statutory Instrument 2005 Nos. 80 and 85, drew special attention to; access to relevant and up-to-date text and other books as well as articles in journals, access to computer networks and the internet, access to general educational equipment, including power point projectors, slide projectors, overhead projectors, video, video cameras, flip charts, typewriters, television sets, public address systems, etc; access to sports and recreation facilities, and students' Exchange Programmes to enhance students' experiences. This literature information from the NCHE (2011) is spot on, because once appropriately implemented then management of massification in the science-based faculties at Gulu University could become less stressful, but more successful.

Furthermore the lecturer-student ratios are among the indicators of quality education in any modern university. In developed countries, the Lecturer/Student

ratios in higher education institutions range from 1:12 in Japan to 1:18 in the United Kingdom (OECD, 2003). In Uganda, the NCHE has set the general Lecturer/Student ratio at 1:15 (Statutory Instrument 80 of NCHE, 2005). Important to note is that Mbarara University of Science and Technology (MUST) and Gulu University had the best Lecturer/Student ratios at 1:8 and 1:12 respectively (VCPU, 2006), which arguably means quality standards should be higher in MUST and at Gulu than in any of the Public Universities in Uganda, taking all factors constant. Similarly, ratios for various discipline areas were indicated: Human and Veterinary medicine 1:8; Science/Technology 1:10; Arts/Humanities 1:15. See details on the next table.

Table 3

Extract from the NCHE Checklist on Capacity Indicators for Academic Staff and Education Facilities Ratios Measured under: Ideal, Good, Acceptable, Can be improved and Unacceptable

Item	Ideal	Good	Acceptable	Can be improved	Unacceptable
Staff/Student ratio					
General	1:15	1:20	1:25	1:40	1:50 or more
Arts/social sciences	1:15	1:25	1:30	1:50	1:60 or more
Medicine, Veterinary	1:8	1:15	1:20	1:25	1:26 or more
Science based profession	1:10	1:15	1:20	1:25	1:26 or more
Law, Education, Statistics	1:15	1:20	1:25	1:30	1:30 or more
Education Facilities					
Students/Library book ratio	1:40	1:30	1:20	1:10	Less than 1:10
Computer/student ratio	1:5	1:10	1:20	1:10	less than 1:10
Access to internet: 1 student per hr.	1:20 hrs	1:10hrs	1:5hrs	1:3hrs	None at all

Source: NCHE (2011:33)

The NCHE for instance used students' enrolment versus the number of books at public universities in Uganda 2005/06 to explain the deviation from the expected.

Table 4

Students' Enrolment versus the Number of Books in Public Universities in Uganda

Institution	Students' Number	Books + Journal & On-line titles	Student/Book ratio	NCHE Acceptable Students/Book ratio	Book needed as Per NCHE	Book deficit gap
Makerere	35,000	382,200	1:11	1:20	700,000	318,000
MUST	1,139	31,892	1:28	1:20	22,780	(+9,112)
Gulu	2,489	7,467	1:3	1:20	49,780	42,313
Kyambogo	7,588	182,112	1:24	1:20	151,760	(+30,352)
MUBS	10,111	50,555	1:5	1:20	202,220	151,665
Total	56,327	654,226	1:12	1:20	1,126,540	472,314

Source: National Council for Higher Education Statistics

Key: MUST (Mbarara University of Science and Technology)

MUBS (Makerere University Business School).

Quality of Academic Staff

This caption focuses mainly on Academic Staff at higher education. According to Eurydice (2008), Academic Staff refers to both qualified staff directly involved in the educational process (such as teaching staff and researchers with lecturing duties) and staff who have a certain form of responsibility in the management and/or coordination of all employees at the institution. Here, the situation of Administrative Staff

(Secretariat, Accounting, Financial Administration, etc.) and of research-only staff is therefore not considered. The quality of Academic Staff is the key to the quality of a university institution. The University and Other Tertiary Institution Act, Section 119 stipulates that “No University or Tertiary Institutions shall employ a Lecturer, Instructor or other person recruited for the purpose of teaching or giving instructions to students whose qualifications do not conform to the standards set by the National Council regulations” (NCHE, 2006). Yandila (1995) in furthering this point observed that academic quality was deteriorating in African universities and that staff recruitment was difficult particularly at senior levels. He thus recommended that the African universities should be very creative in attracting staff for without them; they cannot play their role of human resource development.

Table 5

Recommended Academic Staff Qualifications at University Level as designated by the NCHE

Academic Position	Research Position	Library Position	Qualifications
Teaching Assistant	Research Assistant	Library Assistant	1 st Degree (1 st Class/2 nd Class Upper
Assistant Lecturer	Assistant research Fellow	Assistant Librarian	Master Degree
Lecturer	Research Fellow	Librarian	Master Degree
Senior Lecturer	Senior Research Fellow	Senior Librarian	PhD
Associate Professors	Associate Research Professor	Deputy Chief Librarian	PhD
Professors	Research Professor	Chief Librarian	PhD

Source: NCHE (2006): No. 7

Different countries and universities in the world have set up different terms and conditions to manage their Academic and other Staff. Eurydice (2008) avails the following experiences:

In Denmark, universities are free to determine the number of available positions for Academic Staff, but they must, however, respect a maximum limit for the number of professors, which is established by the Ministry of Finance. The Ministry of Science, Technology and Innovation then distributes the chairs among the universities. Overall, the recruitment procedures are established by ministerial order, with universities being responsible for the recruitment procedure as such. In Estonia and

Latvia, institutions are directly responsible for the appointment of staff (choice of the number and distribution of categories of staff among the different departments), whereas the official regulations state the general and specific recruitment criteria (profile, degree(s) required, previous professional experience, etc.) for each category of Teaching Staff. In Spain, universities decide on the number of available positions (teaching and other), whereas the selection criteria and conditions for access to permanent positions are based on the official regulations in force at national level. Furthermore, public universities have a wider scope for decision-making as regards the recruitment of administrative and Non-Teaching Staff. In Malta, according to the law on higher education, the University and the *Malta College of Arts, Science and Technology* (MCAST) is responsible for determining the number of posts required. MCAST has set its own recruitment criteria for different categories of staff.

However, with regards to the composition, academic staff in the university sector is characterized by considerable gender differences (Jensen, 1997; Ståhle, 1998). In science and engineering the proportion of female staff is predictably small, but in areas such as the humanities, law and medical science, where the majority of students are now women, men continue to dominate the teaching staff, especially at the tenured levels (UNESCO, 2004). This has been an object of debate – including at the political level – during the last two decades, but initiatives taken have been weak and the situation is only changing slowly.

The Romanian Agency for Quality Assurance in Higher Education (ARACIS), set up in 2006, required all universities to perform quality-related self-analysis and self-assessment. The quality of education provided to the students relies on the quality of Academic Staff, as a result of the analysis of three components; Student Assessment, Peer Assessment and Institutional Assessment of the Teaching Staff. It is therefore crucial for institutions to attract, recruit, develop and retain quality academic staff.

With teaching assuming an increasing importance therefore, several of the institutions realized that it was important to train staff in pedagogical and other skills, especially as they have to deal with large cohorts of students. For example Kenyatta University, in 2004, created a Centre for University Pedagogy to train Teachers how to deal with large groups of students. At University Eduardo Mondlane all Mozambican Lecturers are required to undergo training in Teaching Skills. The training was introduced in 1989 through a long-term collaborative project with a Dutch University, financed by the Dutch government. Apart from teaching methods, which is the 'core' course and includes techniques of handling large classes, other courses offered by that centre are; Students' Assessment, Conducting Laboratory Sessions, Curriculum Development and Materials Development. Attending at least one of these courses, essentially the 'Teaching Methods' one, has been a compulsory prerequisite for the promotion of full-time Junior Lecturers (Mohamedbhai, 2008). The innovation that academic staff at University level should train in pedagogical, andragogical and

synagogical skills to add to their capacities in content delivery as well as in addressing the emerging challenges posed by massification is definitely a step towards the right direction because it will strengthen content delivery and lecturers-students interfaces.

Quality Management of Research, Publications and Community Service at University Level

Research and Publications functions are one of the most central and integral part of a University's core function. All over the world, Universities are held in high regards because of a strong research base. The NCHE (2006) emphasises that Universities are supposed to be centres of research, excellence, scholarship, knowledge generation and publications. The VCPU (ibid) underscored that with the ongoing digital revolution and the emergence of knowledge economies, research in universities and elsewhere has assumed more importance than ever before. Tikly and Barret (2007) in their paper, *'Educational Quality-Research Priorities and Approaches in the Global Era,'* advance that there is need for critical reflections on structures and processes of programme management including the empowerment of researchers and research institutions.

Mohamedbhai (2008), while addressing himself to research in his paper: "the effects of massification on higher education in Africa", noted that: research is an important activity of any university and most of the institutions are making a concerted attempt to keep research active in an environment grossly dominated by teaching; a couple of universities have, however, mentioned that lack of funds was a serious

constraint in enhancing the research agenda at university level; at the University of Ghana, the creation of the annual Faculty Colloquium which gives teaching staff, post-graduate and final year students an opportunity to present their research results to the scientific community has stimulated research in the faculty and the publication of the proceedings of Faculty Colloquium contributes in some ways to the promotion of publications in the faculty; at the University of Ouagadougou, in order to encourage research, a financial incentive is given to each academic staff that can show, in an annual report submitted to management, that s/he has been undertaking Research activities during the year. Guided by these broad experiences, it is hereby opined that it would be crucial for lecturers and researchers at Gulu University to get exposed and be oriented to the merits of these great innovations so that their research undertakings may not only improve the mode of content delivery, blend well in the entire educational set-up.

Furthermore Meek et al. (2009) one of the exponents in the field of research propounded that research is not only expensive, but often carries many hidden financial burdens for individual higher education institutions. One of the big debates in many countries is the extent to which Research should be fully funded, covering not only direct costs, but also contributing to overheads and infrastructure. According to Sörlin (cited in Meek Lynn and Davis Dianne 2009:49), the funds that go to universities and research institutes, have for a long time stagnated in most countries...so the fact of the matter is that those institutions that carry out the higher education work and do research have to do more and more work for less funding 'per unit', regardless of whether

the unit is a student trained for three years or a scientific paper researched, written and published. Though an opinion of facts, the foregoing statements discourage both students and academic staff from doing research and the overall promotion of research and innovation functions in a university situation and must not be left unchallenged. Belal and Springuel (2006: 10), argued for example with respect to Egypt that:

“Gaps in education exist at all undergraduate and postgraduate levels for teaching how to perform research and to write up results. Students are not trained to do research, nor taught how to write scientific papers. This essential part of education is completely neglected in both undergraduate and even postgraduate studies. With very few exceptions, the research topics for post-graduate students are proposed by supervisors who have instructed the students and do not encourage the personal student’s thinking. They use a student as the tool for doing the practical or field work but not for research”.

This state of affairs is definitely non-academic and a tendency which discourages; innovations, ingenuity and creativity and undeniably not a good strategy to manage massification as well as train worthwhile academics in a university setting and thus should not be practised at university education and especially in the field of science which is the backbone of the nation’s development. Larzillière (cited in Mouton and Waast, 2009: 159) recounting experience in higher education in Jordan, accentuates that, in Jordan; a faculty member in a university is defined first as an

Instructor whose main job is to teach and whose work hours are teaching hours. In spite of that, job promotions in universities are entirely dependent upon research activity and record. In his study entitled; “making quality a priority in the provision of African Tertiary Education,”

Nhundu (2008) quoting the World Bank remarked that in the previous twenty years, higher education annual enrolment growth for low to lower-middle income countries averaged 6.2 percent and 7.3 percent for upper-middle income countries respectively. Such rapid increases in higher education enrolments according to him raise serious concerns over the quality of education, especially considering that diminishing sources of public funding have led to the neglect of key inputs to teaching and research and prompted private sector participation and commercialisation of higher education.

Gulu University, a young university, with an unproven academic history and recent tradition, lean and few academic staff at the masters and PhD levels (University Guide, 2003-2007), has on its record only organized one annual conference (Gulu University First Annual Conference, 2010), which culminated to the production of the Gulu University Journal, Vol. 1 Issue No. 1 (Gulu University Journal, 2010). This record is certainly inadequate in ten years of existence and raises questions such as; what percentage of the university budget is devoted to research and publications, whether the university has a research policy or has developed a research portfolio or agenda and the extent to which the faculty and students get involved in research.

University and the Community

Modern universities are supposed to be leaders in the social and economic development of their communities and nations (NCHE, 2011). According to Hall (cited in Kagisano, 6, 2010), community can, and does, mean anything from a university's own staff and students and a *community of practice* to civic organisations, schools, townships, citizens at large and "the people" in general. Engagement on the other hand is an equally challenging concept that, when interrogated, opens up a rich vein of inquiry into the nature of knowledge itself. In the words of Harkavy (2000); "To make the case for University-Community partnerships is easy to do. The hard thing is to figure out how to do it. The hardest thing of all, of course, is to actually get it done."

In the traditional sense, universities and other institutions of higher education transfer knowledge (sometime Research-based knowledge) to the surrounding society in two ways; First, and most important, by educating and certifying knowledgeable and graduates who can serve society in appropriate jobs and second by communicating knowledge to the general public, for instance through writing in the press or giving lectures to the public (UNESCO, 2004). In reality, more versatile and complex forms of knowledge transfer have always taken place. For instance, teachers and researchers from institutions of higher education have been members of numerous official commissions and company boards and have used their specialized knowledge in these contexts. This raises the question of relevance of Programmes and Research, to which this research must address itself.

Australian Universities Community Engagement Alliance [AUCEA] (2008)

explains that community engagement is a specific method for academic research and teaching that necessarily involves external communities (business, industry, schools, governments, non-governmental organisations, associations, indigenous and ethnic communities, and the general public) in collaborative activities that address community needs and opportunities while also enriching the teaching, learning and research objectives of the university. Engagement means that communities are not mere laboratories for universities, but they are co-creators and interpreters of knowledge through collaborative research and learning activities. It further explained that community engagement is a form of academic endeavour where external sources of expertise and wisdom are seen as essential to advancing knowledge and understanding. It is not a separate or distinct activity within a university but is a shared enterprise between universities and their community partners that involves an exchange of knowledge and expertise that produces mutual benefit. Again AUCEA (2008) while sharing the Australian situation revealed that although Universities have always interacted with their communities in a range of ways; community engagement specifically encourages knowledge-driven partnerships that yield mutually beneficial outcomes for university and community.

Needless to emphasized, it further revealed that community engagement is transforming and expanding higher education capacity around the world by directing the energy of teaching and research activities toward the critical issues and conditions

that shape their future, locally and globally. It further propounded that Universities benefit from effective engagement with their communities for instance; student-learning outcomes are enhanced through learning experiences and make knowledge relevant to community issues and priorities. To the Australian universities, engagements are believed to broaden the concept of knowledge transfer to reveal that knowledge generation has many possible applications of value to society in addition to commercialisation. They therefore consider engagement as a core activity of a university's research and teaching agenda, and should not be considered a separate undertaking. University engagement is a scholarly activity and it recognises the community as knowledge-rich partner, where; the university's research capacity becomes more accessible as a resource to address community problems or aspirations. Communities gain a wide range of benefits through their productive interactions with universities. In this way communities are recognised for their intellectual assets and empowered to contribute to knowledge generation that directly increases community capacity for action and problem-solving. Engagement makes the knowledge resources of universities accessible to communities in ways that can benefit social, economic, environmental and cultural capacity and conditions. It summarizes that community engagements should be a key component in a university's staff recruitment, induction, promotion, and performance review policies.

To underscore the extent to which community engagement form part of the

University's core function in the science-based departments at Gulu University should not only be a factor of concern in this research, but also critical, is how the university manages the increasing numbers of students going to the community against inadequate educational resourcing.

Quality Management of Institutional Finances at Higher Education Level

Higher education (HE) environments across the globe are frequently described as turbulent and dynamic. This is because both global and national forces are driving change within and across individual countries and their higher education institutions (HEIs). Dinca, G. (2002), while speaking of financial management in Universities in the United States propounded that there are three fundamental aspects that should take centre stage, namely, efficient use of budgeted funds; capacity of universities to generate their own incomes; and ability to design clear and realistic perspectives of the development for a University Strategic Plan.

Parmley et al (2009), while expounding on higher education budgeting practices in the United States further revealed that in the United States the budget processes are diverse, complex, and dynamic and although states may share similarities, there is no standard budgeting practice. They emphasized three key components of the higher education budgeting process, viz; operating budget request, including components of requested funding and the respective roles of institutions, sectors, systems, and states; operating budget negotiations, in particular, the respective roles and interests of the governor, executive agencies, and legislature in determining appropriations; and

operating budget allocations, primarily legal constraints, processes, and other factors affecting the allocation of appropriations across institutions.

Generally, in the US, state budget processes consist of six general and sequential steps: Budget request is developed; request is sent to state legislative and state executive branches for review; governor proposes a budget (known as the executive budget); legislature enacts its preferred budget; governor may subtract from or veto parts of legislative budget; Legislature accepts or overrides governor's action (the resulting funding is the legislative appropriation).

In Uganda, universities' budgeting starts at the user departments' level. This is then forwarded to the institutional level where it is approved by the University Council before it becomes part of the sector ministry's budget for approval at the country's Parliament. However, what remains challenging is that budgetary funding by government of Uganda has always proved a night-mare and has more often than not affected operations at all levels. This study will amongst others wish to share the experience of Gulu University and find out how funding inadequacy has proved out to be an encumbrance in the management of massification in science-based faculties in the University.

Eurydice (2008) recounts a few experiences in Europe with regards to management of institutional finances at higher education level:

In Greece, the budgeting process focuses five headings: staff, operational expenses, student catering, temporary staff and public investments. In Bulgaria there are also five headings: study costs, research, scholarships, costs for publishing textbooks, research results, etc. and costs for capital investment. In Latvia on the other hand, higher education institutions are required to request permission from the *state treasury* to make transfers between amounts established for salaries, expenditure on immovable and other common costs. Similarly in France, institutions must submit the budget proposal to the supervisory authority before implementing it. In certain cases, the budget may be submitted for approval or refused by the authorities (for example, in the case of non-compliance with the budget balance or allocation of public funding). In Hungary, institutions have to send an annual draft budget proposal to the maintainers prior to any spending. The maintainer may initiate the introduction of amendments if it considers that the proposal does not enable the institution to achieve its basic goals. In Poland higher education institutions have to submit their proposed financial activities to the Ministry of Finance but there is no institutionalised authority for their approval.

Meanwhile in Uganda, public universities have three key sources of funding: Government subvention, grants and students' fees and other internally generated funds. In the guideline from the [NCHE] (2011), which is the regulatory authority for Ugandan universities, the areas which are critical to consider in institutional financial management include: the budgeting process; sources of funding; percentage distribution of the budget to priority areas; and the aspect of accountability. As it is indeed des-

ignated in the framework, interest will focus on whether the stakeholders in the institution get involved in the budgeting process and whether budgeting follows planning priorities; where the institution gets most of its funding, whether the auditors are provided with percentage details in the budget, if there is any imbalance between the sources of funds, what deficit exist and how the deficit impact on the delivery of quality higher education and finally to study the system of financial controls and methods of accountability for internal and external purposes.

According to Cooke and Slack (1991), taking part in decision-making builds a sense of ownership and consequent determination to put the decision into effect. Decisions imposed on people from outside do not create this ownership. Isoke (1997) cited by Seettumba (Ibid) argued that involvement in decision making encourages employees to trust the organization more and the decisions made. He further contends that this often reduces resistance to change and contributes to more enthusiastic program implementation. Conflicts have been seen to decline in conditions of collaborative decision-making, thereby promoting effective problem solving and enhanced job satisfaction. Given the centrality of financial management of scarce resources in the delivery and sustenance of quality higher education, university managers are expected to be mindful of the following concerns: the budgeting process, sources of funding, funds internal allocation and the aspects of transparency and accountability (NCHE, 2006).

In conclusion, this chapter has presented literature under various themes to

attempt and explore scholarly inputs to widened debate on; “Quality benchmarks and management of massification”. However, the literature reviewed above, were not addressed to any higher education setting in this country, a gap which this study will attempt to fill through answering the question; “what is the role of Quality benchmarks in enhancing the management of massification at higher education with special reference to science-based faculties at Gulu University.

Research Questions

The study answered the following questions:

1. To what extent is massification experienced in the science-based faculties at Gulu University?
2. How has university autonomy and governance influenced management of massification in the science-based faculties at Gulu University?
3. What possibility is there that efficient and effective teaching and learning Can influence management of massification in the science-based faculties at Gulu University?
4. In which way have research, publications and community service impacted on management of massification on science-based faculties at Gulu University?
5. What is the influence of quality institutional financial management on management of massification in the science-based faculties at Gulu University?

Research Hypothesis

1. There is no massification experienced in the science-based faculties at Gulu University,
2. There is no relationship between university Autonomy and Governance and the management of massification in science-based faculties at Gulu University,
3. Efficient and effective teaching and learning has no influence on the management of massification in science-based faculties at Gulu University,
4. Research, publications and community service have no impact on management of massification in the science-based faculties at Gulu University,
5. Quality institutional financial management has no influence on management of massification in the science-based faculties at Gulu University.

Chapter Three: Research Methodology

Introduction

This chapter outlines the description of the various methods used in the study. The chapter focused on the following themes: Research design, target population, the sample size and sampling techniques, the research instruments, the administrative procedure, validity and reliability, ethical considerations and data analysis.

Research design

The researcher used both qualitative and quantitative research paradigms. Qualitative methods enabled respondents to qualify, describe or explain their views as supported by (Bell, 1933). On the other hand, quantitative methods allowed for collection of precise data, permitted easy sorting, categorization, coding and analysis of data as well as allowed for control of the research situation. A survey research design, single-case and parallel cross-sectional type was used to gather information in the study.

The single case design was chosen because it is very useful in exploring and understanding a uniqueness or exceptionality of a case. The choice of the parallel cross-sectional survey design was because of its ability to use different categories of respondents at a given point in time. The study design provided opportunity for the variables to be measured under the same conditions and for the categories to be given the same or similar instruments. This therefore helped to control the effect of change in conditions on the relationship between the variables. Kumar (2005) cited by Odiya

(2009) noted that the cross-sectional design is good for establishing the prevalence of a phenomenon across a whole population. The researcher preferred the design amongst others because its findings can be generalized to a larger population.

Study Population

The study population included: the Corporate Management level, the Decentralized Management level, the Collegial Management level, the Students' level and other stakeholders from the public. The Corporate Management comprises: Council Chairperson, Vice Chancellor, Deputy Vice Chancellor, University Secretary and Academic Registrar. The Decentralized Managers comprise: - the Deans of Faculties and Heads of Departments. While the Collegial Managers comprise: the Professors and Lecturers. Information was also collected from Students of three Science-based faculties: Human Anatomy, Computer Science and Bio-system Engineering. More information was collected from the public and at least ten reputable institutions.

Sample size

A target population of 417 was planned to draw opinion from the various categories of respondents aligned for the study. Using the Krejcie and Morgan (1970) table, a sampled size of 357 was determined. However, data was collected from only 294 respondents of the 357. This gave an 82% response rate. The study was conducted in semester two of academic year 2011/2012.

Sampling Techniques

The sampling procedures used were purposive, stratified and random.

Purposive sampling targeted respondents from Gulu University and the other Corporate Organizations which were identified for the study. The researcher felt that information derived from these sources would be relevant to answer the research questions identified. Stratified sampling was used to target opinions from the community members. See table below.

Table 6

Category of Respondents, target population, sampled population and Sampling

Techniques

Category of Population	Target Population	Required Sampled Population	Sampled Population	% Computation & Average %	Sampling Technique
Corporate Management (Council Chairman, VC, DVC, US, AR, DoP, DoS, UL, UB)	9	7	7	78.8	Purposive
Decentralized Management (Deans, Directors and Heads of Departments)	6	6	3	50.0	Purposive
Collegial Management: The departments of Bio-system engineering, human anatomy, and ICT)	32	31	23	74.2	Purposive
Students (in Departments of Bio-system engineering, human anatomy, and ICT)	300	246	201	81.7	Purposive
Community opinion	60	57	50	87.7	Stratified
Other Institutions	10	10	10	100	Purposive
Total No. of Respondents	417	357	294		

Source: *Primary Data*

NB:

- i. *The Krejcie and Morgan (1970) table was used to determine required sample sizes at confidence level of 99% and margin of error (degree of accuracy) of 3.5% in all the cases.*
- ii. *Out of the targeted population at least 82% participated in the study. This was a high response rate.*

Data Collection Instruments

Data was collected by use of five instruments, namely: questionnaire, interviews, direct Observation, focus group discussion and archival record checks.

Questionnaire

The questionnaire items were structural in nature and required expression of opinion by identification of the most convincing option by the respondent. The questionnaires targeted four categories of respondents: Corporate Managers, Heads of Departments, Lecturers and the Students, and covered the following key areas as below: Through the use of the Likert Scale: Strongly Agreed (SA), Agree (A), Undecided (U), Disagree (DA), and Strongly Disagree (SD), the researcher tapped the required opinion of the respondents on the subject matter.

Table 7

Representing Details of Questionnaire Items Moderated by Experts

S/N	ITEMS	NUMBER OF QUESTIONS IN EACH CATEGORY				
1.	Background Information: • Corporate Management • Head of Department • Lecturer • Students	4	9	5	7	NIL
2.	Institutional Autonomy and Governance	12	12	12	12	12
3.	Quality of Teaching and Learning	33	33	33	33	33
4.	Sufficiency of Educational Facilities	08	08	08	08	08
5.	Required Ratios	04	04	04	04	04
6.	Research and Publications	10	10	10	10	10
7.	Institutional Financial Management	05	05	05	05	05
8.	University and the Community	04	04	04	04	04
9.	Items for Key informant interviews	34	34	34	34	34
	TOTAL	114	119	115	117	110

*Source: Researcher's Analogy**Interviews*

Through key informant interviews (KIIs) technique, the interviewees were required to give information at an interactive level with the researcher. This approach was appropriate because it allowed for in-depth discussion and expression of opinions on the themes under study. The key informant interviews were used to collect qualitative data to supplement and delve deeper into issues that were not brought out through the data collected during the questionnaire survey. There were 34 items altogether that the researcher constructed to tap the desired responses during the interview process.

Direct observation

Direct observation helped to strengthen information gathered through the questionnaires and interviews. It was both structured and informal. The researcher employed observation purposefully, systematically and selectively as guided by the observation checklist which included amongst others; enrolment records, list of academic staff brochures, just to mention a few, to respond to the research questions.

Focus group discussions

Focus group discussions (FGDs) were used to explore perceptions, experiences and understanding of Lecturers and Students on the research problem. These categories were engaged for between 20-30 minutes and assigned to groups of between 3-5 members for ease of management and better control.

Archival record checks

Archival checks help the researcher to established information about figures, numbers and records that were not easily accessible during the KIIs and FGDs. It also helped to reinforce information elicited through the questionnaires.

Validity

After developing the instruments under guidance of the supervisor and discussion with Colleagues, the researcher involved five experts at an independent level to assess the Content Validity Index. Each of the members went through

a minimum of 110 items. Altogether 575 items were rated. After the ratings, 483 items were rated relevant and 92 items dropped. Content Validity Index (CVI) was computed by the formula:

$$\text{CVI} = \frac{\text{Total number of items rated as valid}}{\text{Total number of items}} = \frac{483}{575} = 0.84$$

The instruments were considered valid because CVI for internal validity stood at 0.84. Any value which is ≥ 0.7 is an acceptable coefficient value for a valid data collection tool according to Kothari (2004).

Reliability

The instruments were pilot tested in a higher institution of learning within the region. This was meant to ensure reliability, consistency, precision and dependability Amin (2005), and to confirm their ability to tap data that answered the objectives of the study. The pilot test was administered to 10 mock respondents mindful of their categories (Top Management, Heads of Departments, Lecturers and the Students). The mock questionnaires returned were then entered in the SPSS computer package to test for reliability. This test was repeated several times and using the scores obtained from the pre-test, the Cronbach's alpha coefficient was calculated to assess the overall index of repeatability or internal consistency of the scale as a whole. The Cronbach's Alpha was 0.893 which depicted a very high chance (about 90%) which is above $(\alpha) \geq 0.7$. Any score above this value is considered a positive measure for reliability as supported by

Amin (2005) and George and Mallery 2003. The Cronbach's Alpha was used because the instruments elicited more than two responses. This result implied that any study which would have been carried out in this particular area of study within the period of the research at the University would have most likely resulted into similar conclusions.

Research Field Experience

During the course of the research, most of the targeted population got productively involved. The lecturers and the students who would have proved difficult to mobilize were demonstratively very cooperative and involved and provided substantial information during the interview schedules and focus group discussions. Administering the questionnaires and interviews were always pre-arranged and done after a lecture or during break time and this created a lot of convenience to the researcher. The community members were also a good category of respondents. They were cooperative and proved interested in the study which seemed, targeting quality improvement of the University where their children studied. The other category of respondents who were easier to access were the various heads of institutions who participated in the study. With this category, most of the meetings took place within their office premises and they were able to address themselves to the researcher's questions appropriately.

The group which was found rather difficult to access in the course of the study, but still provided very substantial information, was the Corporate Management. The

members of Corporate Management had always long lines of clients and were difficult to access. However, what was found challenging in all instances coping-up with pre-arranged appointments. To address this drawback without interfering with the respondents' precious time, the researcher followed them through phone calls and met them wherever they would be conveniently found at a particular time. Sometimes the interactions took place on the street or at eating cafes in town as was convenient to the respondents.

Administrative Procedure

The researcher sought permission from relevant university authority as required by procedure, before getting out into the field. To ensure collection of quality data, the researcher made sure he identified the right category of respondents, capable of providing the right information rather than relying on people who would have provided substandard or inadequate data. Use of Research Assistants was not considered in the overall research process. He made a pre-visit to the research environment, introduced himself and informed the respondents about the aim of the research, sought their consent to participate in the study and made arrangements for data collection. Different sets of questionnaires were administered to the different categories of respondents. The researcher made sure that he did the administration of the questionnaires to all the respondents personally. The reason for this decision was that he wanted to achieve high response rates from the respondents.

To ensure that quality data was obtained, extraneous variables were controlled by randomization; only assumed knowledgeable respondents on the subject matter were involved in the interview and responses were checked on the spot for completeness. Knowledgeable respondents were selected through purposive sampling procedures which ensured that only those charged with management task in the University and those experiencing what the research problem targeted were selected. Quality control was done by ensuring that the response rate was high. This was made possible by contacting the respondents before the date of administering the questionnaires and the interviews.

In the same vein, the questionnaires that were filled underwent spot checking to ensure that all items were responded to. No questionnaire or interview schedules were left in possession of the respondents, but managed and collected there and then. The researcher also used a very consultative approach in the study. Also being a former staff of the University gave the researcher an advantage and easy flexibility within the research situation. Finally Gulu University is still free of research fatigue and this made the research process interesting. The main ethical issues in this study included; informed consent, confidentiality and voluntary participation. The number of respondents who participated was determined by their availability and presence at the pre-arranged venues of the interviews.

Data Analysis

Data was collected from 294 respondents out of the 357 required sample population, which gives 82% response rate. Qualitative data from the various sources were sorted, organized, categorized, synthesized, summarized, analyzed and interpreted into a format from which meaningful conclusions were drawn according to how they answered the research questions. Quantitative data scores were coded by assigning numbers to the responses to the items in the instruments. The Chi-square was used to analyze information derived from the different levels of respondents and to answer research questions that wished to determine the relationships between the different quality benchmarks. Frequency tables and multiple response tables were used to summarize the responses. In computing the Chi-square, all the objectives identified were subjected to test by SPSS version 15.0. The Pearson Chi-Square value for significance was determined between 0.00-0.05. Triangulation was finally employed to examine how the data collected from all the qualitative data answered the research questions.

Limitations

The factor that was beyond the researcher's control and which may have affected the results of the study was that the concept of massification was not comprehensively understood by most of the respondents. They more equated it only to high enrolment of students without looking at the other underlying factors. Secondly, it was noted that most of the University's units did not have a copy of the NCHE quality benchmarks, a document on which the study was based.

Delimitations

The factors that may have affected this study, but which the researcher applied some degree of control were:

1. To encourage ease of data collection the questionnaire structure was simple and based on the likert scale. Similarly the interview guides were simple and comprehensive.
2. Financial constraint was a serious drawback since no funds were released to facilitate the study. However, the researcher used the bare minimum from his meager salary to address the expected.

Assumptions

The research environment was conducive thus the researcher expected to have a high response rate. Gulu University is not yet research fatigued so the researcher expected to meet an enthusiastic team of respondents.

Chapter Four: Data Presentation, Analysis and Interpretation

Introduction

In this chapter, the findings of the study are presented, analyzed and interpreted in line with the research questions and hypotheses as stated earlier at the close of chapter two. The research questions and hypotheses sought to address the following themes with specific reference to Gulu University: Management of massification, Institutional autonomy and governance, Teaching, learning and evaluation, Sufficiency of educational resources, Quality of academic staff, Research, publications and community service, and Institutional financial management.

The findings of research question one

To what extent is massification experienced in the Science-based Faculties at Gulu University?

This question was responded to by all the Respondents who participated in the study: 201 Students, 23 Lecturers, 03 Heads of Departments and 07 members of the Corporate Management as well as the 50 members of the public and the 10 sampled Institutions. The tools used for the study were: questionnaire survey, focus group discussions and key informant interviews. The questionnaires were specifically administered only to the respondents from the University, while the members from the public and the sampled institutions were treated to the interview schedules.

To draw attention to the concept of massification, items 5, 7, 8, 12 and 23 (xii) of the questionnaire under the caption: “Quality of Teaching, Learning and Evaluation”.

The questions targeted the following area: Students enrolment in the department, the average class enrolment over the years, sufficiency of the teaching and learning facilities and whether lecturers are happy with the class enrolment. Similarly question 01 under objective one on the interview guide, sought to find out details of: departmental enrolment, average class enrolment over the years, Lecturers' attitude towards their class enrolments and whether respondents were abreast with the concept "massification".

The results obtained through the key informants' interviews with the students, lecturers, heads of departments and corporate managers revealed that the concept "massification", was not a common terminology in use. However, when the researcher explained the concept in details, then the participants' perceptions were shaped. They then shared their varied opinion on the theme massification. These included: congestion in the classrooms, high students to lecturers ratios, rush for the share of inadequate educational resources, (computers and accessories, lecture chairs, library text books, laboratory equipment, internet sufficiency, education infrastructure, teaching-learning equipment, etc). They observed that the numbers of programmes being implemented are too many and that the planning for educational facilities to match the anticipated growth was not commensurate to the enrolment status. Nonetheless, they observed that several coping mechanisms were introduced to address massification, amongst which were conducting lectures under tree shades and in bicycle-parking yards as indicated in the photos presented herein.

Lecture sessions 1, 2 & 3 in the department of Computer Science



Source: Primary Data

Figure 2. A photograph of Diploma II Computer Science Students attending a lecture under a tree shade



Source: Primary Data

Figure 3. A photograph of Bachelor of Information Technology II Students filling the study research questionnaires



Source: Primary Data

Figure 4. A photograph of Bachelor of Information Technology I Students doing a unit test in a bicycle shade

The response from the Public and the Heads of Institutions also revealed that the University's enrolment is growing faster than it can hold. What featured prominently in their responses when they were asked to suggest areas of improvement in Gulu University were that: the University is admitting too many students without planning for classroom infrastructures and other educational resources, a drawback which they advised must be controlled. Secondly, they decried the over congestion in the classrooms and in the Library as well as the rush for chairs and sharing of rare text books as some of the most awkward experiences reported by both the learners and lecturers.

Corroborating these results with records from the departments, it was prominent to note that the science-based faculties at Gulu University are indeed experiencing incidences of massification. Refer to statistical presentation below.

Table 8

Departmental Enrolment Details in the Science-based departments in 2011/12 AY at Gulu University

Enrolment		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 50	31	13.4	13.6	13.6
	50-100	134	58.0	58.8	72.4
	101-200	16	6.9	7.0	79.4
	201-300	14	6.1	6.1	85.5
	Above 301	33	14.3	14.5	100.0
	Total	228	98.7	100.0	
Missing	No response	3	1.3		
Total		231	100.0		

Source: Primary Data

Notably, most of the respondents 134/231 approximately 58% indicated that in their departments, enrolment figures were between 50-100 students, while figures on average class enrolment indicated that class enrolments in all instances were high. Out of all the 231 respondents who gave their opinion on the subject matter, 39.9% (approximately 92 respondents) indicated that class enrolment figures were high, i.e. above 45 students per class, which is the recommended level to be registered in a class according to prescribed standards by UNESCO and the MoE&S, Uganda.

A Pie-chart representing average class enrolment over the years

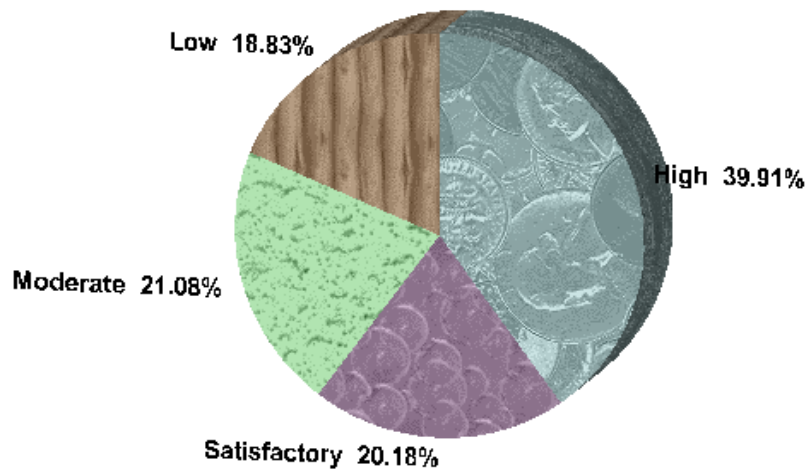


Figure 5. A pie-chart representing percentage trends in class enrolment in the departments studied

In table 9 below the perspectives of the four categories of respondents on class enrolment details are represented:

Table 9

Detailed Responses by Students, Lecturers, Heads of Departments and Corporate Managers on Class Enrolment Status

Category	Response Representation by Numbers and Percentages										Tot. No.	%
	High	%	Satisfactory	%	Moderate	%	Low	%	No Response	%		
Students	72	35.8	39	19.4	46	22.9	39	19.4	05	2.5	201	100
Lecturers	10	50.0	06	30.0	02	10.0	02	10.0	-	-	20	100
HoDs	01	33.3	01	33.3	01	33.3	01	33.3	-	-	03	100
CM	06	85.7	01	14.3	-	-	-	-	-	-	07	100
Total	89		47		49		43		05		231	

Source: Primary data

Scanning through the data presented in the table 9, it is notable that more respondents in their categories agreed that class enrolment was high; students 35.8%, lecturers 50.0%, and CMs 85.7%, except the HoDs, who tied in opinion with 33.3% response rates respectively. What is quite interesting in this finding is that the CMs who are the policy implementers also agree to the notion that class enrolment was high. In terms of whether the number registered per class matched the available educational resources, there were clear indications from the respondents that the educational facilities were difficult to access in the science-based faculties in all the instances as portrayed in table 10 below. This means the student to facility ratio is high, a clear indication of unplanned enrolment; thus massification.

Table 10

Respondents' Opinion on Sufficiency of Educational Facilities in the Science-based Departments Studied at Gulu University

Ed. Facilities	Adequate = Readily Available	Satisfactory = Can be accessed	Inadequate = Difficult to access
Library Reading Space	19.65	25.33	55.02
Library Text	11.40	28.51	60.09
Library Chairs	13.91	33.48	52.61
Classroom Space	24.56	31.14	44.30
Classroom Chairs	17.47	27.07	55.46
Laboratory Space	13.39	18.75	67.86
Laboratory Chemicals	6.94	21.76	71.30
Laboratory Equipments	4.55	17.73	77.73
Average	13.98	25.47	60.54

Source: Primary Data

The most outstanding features of this table are highlighted in the insufficiency of educational facilities in the library, laboratory, availability of laboratory chemicals and laboratory equipment, where most of the respondents pointed out that it was difficult to access some key educational facilities in the science-based faculties. The implications of these are that there would be a rush by students to access these educational facilities thus causing a stressful learning condition.

Tallying these results against respondents' views on the state of required educational ratios in the science-based departments presented in table 11 on page 81, it remains significant to note that most of the respondents opined that the ratio of students' to facilities remained rated unacceptable by NCHE guidelines. Similarly, comparing and contrasting these results with the responses from the KII elicited from Q6, Q7 and Q8 administered to all categories of respondents; there was confirmation that the science-based faculties at Gulu University are experiencing acute shortages of educational facilities compared to the present students' numbers. The hard hit areas included: laboratory equipment, laboratory chemicals, laboratory space, library text, classroom chairs, etc in that order. This finding supports Mohamedbhai's (2008) postulation that massification is a situation of inadequate and stagnant educational infrastructural growth and other educational resources against an increasing students' population. The researcher identified the parameters used because they were found most relevant to measure the incidences of massification. Refer to the table 11 on page 81 for the percentages analysis.

Table 11

Respondents' Opinion on the State of Required Educational Ratios in the Science-based Departments Studied at Gulu University

ITEMS	Ideal	Good	Acceptable	Can be improved	Unacceptable
Ratio of relevant Text to students	15.04	15.49	16.37	28.76	24.34
Laboratory equipment to Students' ratio	5.02	3.20	9.13	25.57	57.08
Computers to Students ratio	10.13	13.22	10.57	21.59	44.49
Access to internet per Student hour	12.56	6.28	7.17	37.22	36.77
Average	10.69	9.54	10.81	28.28	40.67

Source: Primary Data

The Findings of research questions two

How has University Autonomy and Governance influenced Management of Massification in Science-based Faculties at Gulu University?

Table 12 on page 83 gives a picture of the respondents' viewpoints on quality of Institutional Autonomy and Governance at Gulu University. The table contains 12 questions all together.

Institutional Autonomy

Notably, of the 231 questionnaire respondents who participated in the study, at least 65.5% shared common opinion that the organs of Council and Senate are properly instituted at Gulu University against 19.03% and 15.49% that disagreed and were

undecided respectively. This was also confirmed during face to face interviews with key informants and during the focus group discussions. The two Deans interviewed consented that both Council and Senate are instituted according to article 38 (1) and 44 (1) of the UOTIA, 2003 respectively.

Table 12

Respondents' Views on Quality of Institutional Autonomy and Governance at Gulu University

ITEMS	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	% Total
1. Council and Senate are properly instituted organs in Gulu University.	15.9%	49.6%	15.5%	13.7%	5.3%	100.0%
2. The staff union and students' guild are properly instituted organs in Gulu University.	10.0%	58.5%	7.0%	17.0%	7.4%	100.0%
3. The staff and students are represented on Gulu University Senate & Council.	22.0%	57.7%	6.2%	9.3%	4.8%	100.0%
4. Gulu University Council respects and encourages staff and students' views in Council.	7.0%	30.6%	14.0%	28.8%	19.7%	100.0%
5. Gulu University Council implements staff and students' welfare concerns promptly.	3.1%	21.9%	9.6%	41.2%	24.1%	100.0%
6. Gulu University Senate respects and encourages staff and students' views in Senate.	4.8%	35.8%	15.3%	30.1%	14.0%	100.0%
7. Gulu University Senate implements staff and students related concerns promptly.	4.4%	30.3%	11.0%	36.8%	17.5%	100.0%
8. The mandate (vision and mission) of Gulu University are clear.	23.0%	53.9%	6.1%	12.2%	4.8%	100.0%
9. The mandate (vision and mission) cater for all the key areas in the University.	9.2%	43.0%	18.4%	22.4%	7.0%	100.0%
10. The strategic plan of the University caters for all university's plans appropriately.	7.0%	31.9%	14.0%	35.4%	11.8%	100.0%
11. Staff in the University is recruited according to the guidelines set by NCHE.	33.9%	47.8%	10.9%	4.8%	2.6%	100.0%
12. Staff in the University is disciplined according to guidelines prescribed in the ACT.	35.5%	42.0%	10.4%	7.8%	4.3%	100.0%

Source: Primary Data

Similarly, when the opinions of members of the Corporate Management team (the Deputy Vice Chancellor (DVC), University Secretary (US), Academic Registrar (AR), University Planner (UP) and University Librarian (UL) were sought separately, all agreed to the notion that both Council and Senate are properly instituted organs at Gulu University. 68.56% and 79.74% was a representative position of their consent respectively against 24.45% and 14.11% disagreements, while 6.99% and 6.17% were undecided respectively. When this same concern was raised in Q2 (i-iii) during focus group discussions and interview sessions held with the Lecturers and Students and the corporate management team respectively, there was confirmation that the organs of Council and Senate are functional at Gulu University.

Institutional Governance

However, when the researcher corroborated question 5 and 7 on the questionnaire document under the caption; Institutional Autonomy and Governance, (Q5: Gulu University Council implements Staff and Students' related concerns promptly and Q7: Gulu University Senate implements Staff and Students' related concerns promptly), with question Q2 (iii) under objective 2 on the interview guide which states: Does Council and Senate address their mandates to the satisfaction of the university stakeholders? The unanimous position was that both Council and Senate of Gulu University are slow to respond to staff and students' concerns and sometimes they dis-agreed on the implementation of standing guidelines. A case in point reported by the Deans and Heads of Departments during the interview sessions pointed a finger to how council over ruled senate's position with regards to the creation of "special

retakes” (a re-sit examination), a decision which senate felt was irregular, a breach of regulations and not defensible by standing provisions; the programmes’ regulations as well as the semester credit system regulations. According to one of the HoDs interviewed, the special retake provision was created to advantage final year students who might have failed a course or some courses during the course of their studies, to complete without doing the normal retake, and graduate in record time contrary to standing regulations under retaking a course or courses-under provision 3 xviii (7) of the semester system regulations which states that; “a final year student whose final examination results have been classified by the relevant faculty or institute board and has qualified for the award of a Degree/Diploma/Certificate, shall not be permitted to re-take any course or courses; and 3 xvii (8) which states that there shall be no supplementary examinations in the semester system...when a student has to re-take a course, then s/he has to wait and re-take that course when it is next offered”. This isolated incidence however, should not discredit the positive roles Council played and continue to play in the entire growth and development of the University.

The foregoing statements are demonstrative of poor corporate governance practices and this was supported by responses from the questionnaires where general opinion of 65.3% and 54.3% felt that both Council and Senate respectively do not implement staff and students’ views and concerns promptly, against 25% and 34.65 levels of agreement, while 9.65% and 10.96% were undecided respectively. At the departments, the levels of disagreements were recorded as follows: (70.13% and 76.62%, 38.59% and 68.42% as well as 57.47% and 47.19%) for Human Anatomy,

Bio-system Engineering and Computer Science respectively, while the level of agreements were 12.99% and 25%, 24.56% and 37.50% and 33.33% and 38.20% in that order. On a further response to Q2 (iii), the Deans, Heads of Departments, Lecturers and Students in their various cohorts of face to face interviews and focus group discussions, had a similar opinion that both Council and Senate implementations do not satisfy the expectations of the stakeholders. One significant example the Deans tied in with the Heads of departments was on the number of occasions, both the students' and staffs' representatives made appeals to Senate and Council on the issues of procuring more lecture chairs, equipment for practical disciplines as well as the recruitment of adequate academic staff to correspond to the pressure of unplanned enrolment, but no prompt actions were given.

Needless to restate, the conclusion one draws from these responses is that, though these key University Organs are well established in line with provisions 38 and 44 of the UOTIA, their performances should help to satisfy the expectations of the stakeholders and especially in addressing the pressure created by the explosive students' numbers against limited educational resources so that the incidences of massification is averted. Notably, there were low percentage agreement responses of 37.55%, 25.00% and 34.65% for questions 4, 5 and 7 which sought to establish how the Council and Senate at the time addressed operational matters.

The findings of research question three

To what extent has efficient and effective teaching and learning influenced the management of massification in Science-based Faculties at Gulu University?

The question was answered by data drawn from tables 13 and 16 on pages 88 and 96 respectively, whose main focuses were to assess the quality of teaching, learning and evaluation, and the performance of Lecturers?

The two tables generated up to 22 sets of questions; 10 in table 13 on page 88 and 12 in table 16 on page 96. In table 13, the issues which stemmed out as drawbacks to quality standards were reflected in question 1, 2, 3, 7, 9 and 10 whose responses suggested that: The semester schedules are not promptly observed, that there is a problem with starting teaching and learning at the start of the semester, that the NCHE checklist is not very popular in guiding teaching and learning, that practical disciplines are not well managed in the curriculum, that students don't evaluate their Lecturers, and that the Heads of Departments don't carry-out regular observations of their Lecturers.

Table 13

*Respondents' Opinion on Quality of Teaching Learning and Evaluation in the
Science-based Departments at Gulu University*

ITEMS	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	% agreement
1. Students and Lecturers report to the University promptly at the start of the Semester	14.47	32.89	3.95	33.33	15.35	47.37
2. Teaching and Learning start promptly every semester	15.72	33.19	4.80	32.31	13.97	48.91
3. The University follows the Uganda NCHE (National Council for Higher Education) quality standards/check lists to guide teaching and learning	8.48	39.29	22.77	20.54	8.93	47.77
4. Management reports indicate that Lecturers avail students with course outlines in their departments	34.78	53.04	1.74	7.83	2.61	87.83
5. Reports on syllabus coverage in all programmes are Satisfactory	18.50	47.14	4.41	20.70	9.25	65.64
6. Management reports indicate that assessment feedbacks are sent timely to the students	15.86	38.77	2.64	24.23	18.50	54.63
7. Management reports indicate that the departments organize practical work for the Learners as stipulated in the course outline	6.64	21.68	4.87	31.42	35.40	28.32
8. Management reports indicate that attendance records for Lecturers and Students are Available	30.26	49.12	7.02	8.77	4.82	79.39
9. Management reports indicate that students get involve in evaluating their Lecturers	2.62	13.97	8.73	31.44	43.23	16.59
10. Management reports indicate that Heads of Departments carry-out regular observations of lectures	7.02	21.49	15.79	28.95	26.75	28.51
Average	15.44	35.06	7.67	23.95	17.88	50.49

Source: Primary Data

Scrutinizing the details of the statistics presented in table 13 in view of the interviews conducted with the Corporate Management, Heads of departments, lecturers and students, the related concerns expressed indicated that the late reporting at the start of the semesters, irrespective of the department, is a bad culture and should be stopped. This is because the overall implication impinges on the semester load thereby affecting the quality stance of the discipline. One of the Deans was concerned to note that when this kind of academic indiscipline compounds with the pressure created by the increasing students' numbers against the limited facilities then the matter of quality assurance is laid to waste.

Needless to reiterate, response from the Management team apparently indicated that only about 65.64 % agreed that syllabi coverage is satisfactory and 34.46 % neither dis-agreed nor were decided on the subject matter. These levels of disagreements or indecisions are critical in terms of academic achievement because it impacts directly on the Learners' subject competence. However, in the Department of Computer Science, the Head of Department revealed that, an innovative approach of sending text messages to Students and Staff as reminders for prompt reporting was introduced and being enforced. On the report whether practical disciplines are given due attention as recommended in the various syllabi, there was a 66.82% dis-agreement of all Respondents. Meanwhile, 52.63%, 75.44 % and 73.25% were levels of disagreements expressed by the departments of Human Anatomy, Bio-system

Engineering and Computer Science respectively. The major short comings quoted by most of the respondents cited the inadequacy of the necessary science equipment and facilities.

Turning to whether the Heads of Departments supervise their Lecturers, 55.70% of all Respondents expressed dis-agreement. Similarly, 69.34%, 66.66% and 67.42% were levels of disagreements expressed by the three departments in the same order respectively. The major reason advanced by the HoDs for this negligent lingered around the pressure created due to the insufficiency of the required staff in the department which thus culminates into heavy schedules mounted on them. What these revelations pointed to is the fact that the University authorities have to re-vamp their attention towards the recruitment of more academics so that the management of teaching and learning in the Science-based Faculties if quality education has to be successfully attained.

Answering the concern whether the NCHE checklist is popularly used in the faculties and departments, the response was a rather disappointing one with only 47.77% of the respondents seemingly in agreement that the checklists are used. Conversely the following levels of dis-agreements were recorded at departmental levels: Human Anatomy 36.00%, Bio-system Engineering 25.93% and Computer Science 26.00%. Seeking the opinions of the Deans and Heads of Departments during their interview schedules, they disappointedly revealed that the use of NCHE quality

checklist is not prominent in their faculties and departments. They however agreed that at times senate draws their attention to the observance of the checklist and also directs the office of the Academic Registrar to make follow ups. They further revealed that even the pamphlets of the NCHE checklists are lacking and unavailable at departmental levels. The summary from the Deans' responses revealed that the NCHE guidelines are dispatched to universities at policy level, however, their implementation needed to be enforced. The implication of that gap actually left the Heads of departments and the lecturers uninformed about many of the quality checks which should have guided the management of teaching and learning, e. g; facility to student ratio, space specification to student ratio, student to lecturer ratio, etc. which eventually culminated into poor mitigation of massification at the various levels.

When the opinions of the lecturers and students were sought during their focus group discussions, they appeared totally ignorant about the NCHE quality assurance checklists. They revealed that apart from the course outlines given them by their Lecturers at the start of their courses, no other documents to guide teaching and learning were availed to them. This again is a serious quality assurance drawback, since the Lecturers and their Learners are in a total blackout of what mandatory conditions they should abide by in the teaching-learning environment as stipulated by the NCHE quality checks. Other areas where serious attentions were focused in the table above were responses to questions 7, 9 and 10 under the following headings: Organization of practical work as indicated in the course outline, Students' evaluation of their Lecturers; and, Supervision of the Lecturers by their Heads of Departments.

Organization of practical work as indicated in the course outline 28. 32% agreement against 66.82% dis-agreement.

Most of the respondents dis-agreed that practical disciplines in the science-based faculties at Gulu University are organized as stipulated in the course outlines. The general outcry was on the high students' numbers and the lack of equipment and facilities. The equipment to student ratio was discovered high in all the departments studied e.g. in the Department of Human Anatomy, there were only 8 cadavers, 9 microscopes to serve 85 students, giving the equipment to student ratios of 1:10.6 and 1:9.4 respectively. The figure below shows the microscope settings in the microbiology laboratory.



Figure 6. A photograph of Microscopes in the micro-Biology Laboratory at Gulu University Faculty of Medicine

Besides, there are only two Lecturers in the department of Human Anatomy.

Opinion of all the students interviewed from this department indicated that inadequate learning facilities greatly infringe on the management of the practical teaching sessions because Learners have all the time to crowd around the equipment or specimens and that makes learning stressful and impairs efficient and effective interaction with the learning aid. A Chi-square test was run, to establish the relationship between required ratios and quality of teaching, learning and evaluation. The Pearson Chi-Square value was found to be 35.827 with 20 degrees of freedom and an assumption significance of 0.016, which is less than 0.05. This means, the hypothesis that there is no relationship between required ratios and quality of teaching, learning and evaluation is rejected. The required ratios therefore have a significant influence on the quality of teaching, learning and evaluation at 5% level of significance. This result strengthens the position and tallies with the opinion expressed by the students from the Faculty of Medicine on the negative impact created by lack of teaching-learning facilities on the students. What this result postulates is that to manage incidences of massification, the academic units must balance students' enrolment with the teaching learning resources.

See interpretation in the table on page 94.

Table 14

Relationship Between Required Ratios and the Quality of Teaching Learning and Evaluation in the Science-based Departments at Gulu University

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	35.827 ^a	20	.016
Likelihood Ratio	37.714	20	.010
Linear-by-Linear Association	17.968	1	.000
N of Valid Cases	231		

a. 19 cells (63.3%) have expected count less than 5. The minimum expected count is .02.

In the department of Computer Science where most of the students go for their computer hands-on experiences, the computer to students' ratio is even worst with hardly 20 computers in working conditions, with the rest broken down, but serving over 500 students. Here the situation is rather unique because it is compounded with students from other faculties also rushing into the department to have their hands-on experiences. In the department of Bio-systems engineering, most of the equipment is lacking so the students have to go to other institutions for their engineering practical. Again this is considered time wasting, expensive, a sign of improper planning for the educational resources and at times risky because of the long journeys the students have to make to Arapai Agricultural College, Ngetta Farm Institute in Lira, Comboni

Vocational school or Makerere University farm at Kabanyolo. However, on a rather contradictory note, when a chi-square test was run, to establish the relationship between sufficiency and quality of educational facilities and quality of teaching learning and evaluation, the Pearson Chi-Square value was found to be 10.118 with 12 degrees of freedom and an assumption significance of 0.606 which is more than 0.05. This means, the hypothesis that there is no significant relationship between the sufficiency and quality of facilities on the quality of teaching, learning and evaluation is accepted. See table below.

Table 15

Relationship between Sufficiency of Quality of Educational Facilities and Quality of Teaching, Learning and Evaluation in the Science-based Departments at Gulu University

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.118 ^a	12	.606
Likelihood Ratio	12.982	12	.370
Linear-by-Linear Association	.262	1	.609
N of Valid Cases	231		

a. 14 cells (70.0%) have expected count less than 5. The minimum expected count is .01.

The sufficiency and quality of facilities therefore have no significant influence on the quality of teaching, learning and evaluation at 6% level of significance. This rejects the respondents' position that inadequacy of facilities has a direct influence on the quality of teaching, learning and evaluation. The clear explanation to this conclusion is justified by the fact that; innovations, creativity, discoveries, research, replication, inquisitiveness to learn and the application of various methods for content delivery by the Lecturers and the general level of inquisitiveness by the Learners normally determine the teaching-learning and evaluation direction.

Students' evaluation of their Lecturers 16.95% agreement against 74.67% dis-agreement.

The students' responses in their focus groups on this caption were very disturbing. Most of them observed that they do not have any avenue for objectively criticizing their lecturers. Their greatest complaints were targeted towards lecturers cutting lectures or at times unprepared to deliver lectures. With respect to the department of computer science, the students reported that sometimes there is even collaboration between the class representative and the lecturers to have the latter's attendance list signed even if the lectures were not delivered. In other instances lecturers sent notes to be dictated to the class, but follow-up explanations of these notes sent to students were not given promptly.

The foregone contention tallied with the poor percentage response rate of only (33.91 %) of respondents who agreed that lecturers use the available time assigned on the time table correctly. The students therefore strongly suggested that end of semester evaluation on each course should be done so that they are able to give their opinion on subject content, the general teaching-learning situation, coverage done, as well as on their Lecturers. Their greatest worry is that, the ever growing students' number is overwhelming the capacity of the educational facilities and resources to the detriment of quality provision of education.

Supervision of the Lecturers by their Heads of Departments 28.51 % agreements against 55.70% dis-agreements.

Notably the percentage agreement levels here is extremely low, an implication that quality standards are at stake and should be re-addressed. When the Heads of departments were asked during their interview sessions, they indeed agreed that they don't carry-out evaluation of their lecturers because they are convinced that they are doing a good job. They insinuate that the number of Lecturers on the ground is significantly low, yet they are able to fairly manage the increasing numbers of students.

Pointless to accentuate, what can be drawn from this response, points to the fact that there is complacency and over assumption by the Heads of Departments of their roles and responsibilities. Secondly, this response pre-supposes that some Heads of departments instead of viewing evaluation of lecturers by students as a holistic exercise to include how the programmes' expectations and the course outlines are being unfolded in the departments, what educational facilities and resources need

restoration, what class enrolment is being experienced in the department, have simply narrowed it down to seeing staff report on duty.

Table 16

Respondents' Opinion on Lecturers' Performances in the Science-based Departments at Gulu University

ITEMS	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	% agreement
11. Students and Lecturers report to the University promptly at the start of the Semester	14.47	32.89	3.95	33.33	15.35	47.37
12. Teaching and Learning start promptly every semester	15.72	33.19	4.80	32.31	13.97	48.91
13. The University follows the Uganda NCHE (National Council for Higher Education) quality standards/check lists to guide teaching and learning	8.48	39.29	22.77	20.54	8.93	47.77
14. Management reports indicate that Lecturers avail students with course outlines in their departments	34.78	53.04	1.74	7.83	2.61	87.83
15. Reports on syllabus coverage in all programmes are Satisfactory	18.50	47.14	4.41	20.70	9.25	65.64
16. Management reports indicate that assessment feedbacks are sent timely to the students	15.86	38.77	2.64	24.23	18.50	54.63
17. Management reports indicate that the departments organize practical work for the Learners as stipulated in the course outline	6.64	21.68	4.87	31.42	35.40	28.32
18. Management reports indicate that attendance records for Lecturers and Students are Available	30.26	49.12	7.02	8.77	4.82	79.39
19. Management reports indicate that students get involve in evaluating their Lecturers	2.62	13.97	8.73	31.44	43.23	16.59
20. Management reports indicate that Heads of Departments carry-out regular observations of lectures	7.02	21.49	15.79	28.95	26.75	28.51
Average	15.44	35.06	7.67	23.95	17.88	50.49

Source: Primary Data

In table 16 above, attention was drawn to questions 8, 11 and 12 which address: The use of time assigned on the timetable correctly, the use of tutorials to augment teaching and learning and whether lecturers are happy with the class enrolments.

The use of all the available time assigned on the time table correctly.

The students complained during their focus group discussions that more often than not the Lecturers do not turn up for the tutorial sessions. The position of the Students featured very clearly with a dis-agreement rate of (57.83%) on item 8 in the questionnaire respond on table 16 page 98, which sought to find out whether Lecturers use all the available time assigned on the timetable correctly. The students further observed that they would prefer to use such moments for their own private studies or group discussions or hands-on experiences in the computer laboratories or for internet surfing in the library or for writing their coursework. The Lecturers on the other hand didn't challenge the students' position during their interviews, but reasoned that the pressure mounted on them because of the demand on the timetable sometimes made them assign work to their learners instead of being in class physically. These observations from the students and their lecturers are quite indicative that the teaching-learning process has some management challenges to be fixed.

The use of tutorials to augment teaching and learning in Science-based Faculties at Gulu University 49.57% agreement against 46.96% dis-agreement.

The use of tutorials to augment teaching and learning was noted to be poor and rare in the Science-based departments at Gulu University. The Lecturers observed that the Learners' response to tutorial engagements is very poor and therefore feel that the time allocated for tutorials on the time table should be used for other productive academic activities in the department. Secondly, they argued that, because of inadequate classroom space due to the many programmes mounted, most classrooms are engaged for normal lectures or practical, thus availing difficulties in finding no space for the tutorial sessions. This observation should however, not compromise the importance of tutorials in the teaching-learning process.

Are lecturers happy with the class enrolment?

The lecturers during their interview session vied that their number is thin on the ground compared to the ever increasing enrolment and number of courses they are made to teach to the extent that they find themselves overworked and left with little time for their personal researches and other academic pursuits, and do sometimes sacrifice time for tutorial sessions in order to satisfy those other obligations. This is confirmed by the 46.96% level of dis-agreement on question 11 on the table on page 98. It is however noted in the table that Lecturers' performance is generally good except for not utilizing all the time allocated on the timetable correctly.

In concluding discussion on this research question, the researcher wishes to

argue that to successfully manage massification in science-based faculties, Gulu University management and indeed all other managers in higher institutions of learning should emphasize the improvement of educational facilities and resources.

The findings of research question four

In which way has Research, Publications and Community Service impacted on the management of massification in the Science-based Faculties at Gulu University?

Respondents' viewpoints on this research question have been analyzed in tables 17 and 18 on pages 104 and 106 respectively. Table 17 handled research and publications issues while table 18 addressed community service matters.

On research and publications the analysis pointed to the fact that research and publications functions still lack the attention they deserve in the science-based faculties at Gulu University, e. g, it was noted that Gulu University has, to date, no standard research agenda or portfolio was developed. The respondents' opinion in this respect indicated that there was a 26.43% agreement against 54.18% dis-agreements on the question. Similarly out of the other nine questions, that investigate the status quo, only Q4, which sought to find out whether lecturers encourage their students to do research scored high response rate of 78.6%. All the other questions scored very poorly, yielding an average percentage response of only 28.31%. Needless to emphasize therefore, this implies that the University should strengthen the research portfolio, first and foremost by enacting a comprehensive and a standard research and

publication policy as well as target adequate funding for the sub-sector. However, the only consolation that can be derived from the analysis is that the potential to develop research in the science-based faculties is great because of the single fact of great enthusiasm of the lecturers to participate in research and publication as manifested by their students.

Table 17

*Respondents' Opinion on Quality of Research and Publications in the Science-based**Departments at Gulu University*

ITEMS	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	% Agreement
1. The University has a clear research agenda/portfolio that students are aware of	5.73	20.70	19.38	25.55	28.63	26.43
2. Lecturers in the University are promoted largely because they do research and publish	3.57	1.88	39.29	19.20	16.07	25.45
3. Lecturers in the University present papers in seminars	3.06	31.88	35.37	21.40	8.30	34.93
4. Lecturers in the University encourage student to do Research	20.52	58.08	6.99	8.30	6.11	78.60
5. Lecturers in the University have published many academic papers	1.32	16.30	33.48	33.04	15.86	17.62
6. There are articles from the department that have been published in local and international journals	3.96	21.59	26.87	25.11	22.47	25.55
7. Students are involved in a number of research projects won in the University	3.96	21.59	14.54	33.48	26.43	25.55
8. There are books with ISBN/ISSN published by staff in the University	0.88	11.45	27.31	31.28	29.07	12.33
9. Some percentage of University budget is allocated to research and publications	1.32	14.98	30.84	26.87	25.99	16.30
10. Some percentage of the University budget is allocated to staff and students for research and publications	2.65	17.70	14.60	23.45	41.59	20.35
Average	4.70	23.61	24.87	24.77	22.05	28.31

Source: Primary data

The aforesaid statements on research outcomes have been manifested in the following key areas; inadequate presentation of papers in seminar, conferences or

symposium by the staff and students where 32.47% agreement was scored against 25.97% dis-agreement and 41.56% undecided. On research and publication of articles in refereed journals 5.45 agreement against 35.27% dis-agreements and 39.29% indecision were recorded. On publication of books with ISBN/ISSN numbers in the department, 15.58% agreement against 63.64% dis-agreement and 20.78% indecision.

When results from the questionnaires were corroborated with information gathered through the interview sessions with the Heads of departments and in the focus group discussions held with the students and lecturers, the consensus view was that though research is one of the core functions of a university; it is still need to be given its central position in Science-based Faculties at Gulu University. This was attributed to the fact that it is not prioritized in terms of funding. A Chi-Square test was run, to establish the relationship between Institutional Financial Management and Quality of Research and Publication. The Pearson Chi-Square value was found to be 145.385 with 30 degrees of freedom and an assumption significance of 0.000 which is less than 0.05. This means the hypothesis that there is no significant relationship between Institutional Financial Management and quality of Research and Publication is rejected. Institutional Financial Management therefore has significance influence on the quality of Research and Publications at 0% level of significance. See table on page 122.

Table 18

Relationship between Institutional Financial Management and Quality of Research and Publications in the Science-based Departments at Gulu University

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	145.385 ^a	30	.000
Likelihood Ratio	62.072	30	.001
Linear-by-Linear Association	23.885	1	.000
N of Valid Cases	231		

a. 34 cells (81.0%) have expected count less than 5. The minimum expected count is .00.

The Heads of departments revealed that they lack basic equipment and laboratory facilities to conduct scientific researches. In the Department of Human Anatomy, for instance, the researcher physically counted 8 cadavers, 8 microscopes of which he was told only five were in good working conditions, a dozen of broken histology slides, etc. In the department of Bio-system Engineering, a newly constructed laboratory is standing, but not furnished with basic equipment.

The lecturers opined that their greatest drawback in the area of research hinge so much on the volume of work created due to the demand on the time table for: lectures, tutorials, practical and coursework assessments, which, when coupled with the rising numbers of students, give them very inadequate time to do research, write papers for publications, as well as consternate on the internal research projects of their

students. They further revealed that the few research concepts they have written have failed to be sponsored or selectively sponsored because of inadequate funding in the Sub-sector. In fact, scanning through the lists of papers and articles published in the Gu-lu University Journal, 2010, it is not surprising to confirm that very few of the articles are attributed to the departments of Human Anatomy, Bio-systems engineering and Computer Science.

On a positive note, however, the Heads of departments and lecturers agreed that the establishment of the Institute of Research and Graduate Studies (IR&GS) was a positive move towards strengthening the research portfolio. They revealed that the IR&GS is putting a great deal of effort to strengthen research and publication capacity in the University. They recounted initiatives like; calling for abstracts of papers for the annual conference, organization of annual conferences and departmental workshops targeting research and publications as some of the milestones being covered in the area.

The students on the one hand confirmed that the lecturers encourage them to do research and publish but the major drawback is inadequacy in funding. They however expressed disappointment in the way their internal research projects are being supervised. This complaint mostly came from students in the department of computer science where they reported that because the numbers of students are high, the lecturer-students ratio is high resulting into shoddy assessment of their project work. One student nastily commented that the lecturers do more of administrative

supervision other than the academic one which is more critical and analytical. They however, contended that they have participated in many researches with the University at the levels of Research Assistants, Translators or when students are deployed in the communities to conduct some studies.

When opinion of members of Corporate Management was sought in this regard, they felt sympathetic with the situation, but hastened to report that the biggest challenge the University is experiencing in Research, Publications and Community Service is; inadequate funding from government. Management revelation was that only about 60% of their budgetary expectations were funded yearly. This, according to them, leaves a huge gap which always makes them gamble in fund allocations to the extent that satisfying all priority areas becomes challenging, leading to poor performance of the targets set. However, if the reflection depicted in the pie chart is true that of all the respondents who participated in the study, about 48.88% casted doubts on how the University prioritizes its funding and only 2.24% imagined that funding priority goes towards research and publications, then the University should revisit her priorities in line with the University's core functions as well as the strategic goals and objectives.

Similarly, most of the community members, some of whom are alumni of Gulu University and Heads of institutions who participated in the study, tied in opinion that the research capacity of the students are still low and needed to be revamped. The alumni went further to observe that the level of research supervision and research

capacity in the University is low and thus needed to be supported. They claimed that the number of students assigned to an individual lecturer for in-depth attention is high and coupled with other irregularities that impact on the academic pursuit in the course of the semester makes the learners get little attention from their supervisors. The management strategy that can be adopted to address massification in this regard would be to assign manageable numbers of students to each individual Lecturer for the latter's professional guidance and improvement of funding in the sub-sector.

On table 19 on page 126, the respondents' views on university community services were elicited. Notably, there were many areas of involvement enumerated by the respondents from within the University, as worthwhile University initiative, from which the community benefited:

In the department of Computer Science, the following were enumerated as initiatives that targeted ICT training in the community: The NUFFIC project helped in training up to 250 various category of women (Teachers, Police Officers, UPDF Officers and Local Councilors) in computer skills, the Invisible Children targeted improving ICT skills amongst secondary school teachers and others like the TULANE project and the Uganda Fund; all of which propagated empowering the community in ICT capacity building.

Table 19

Respondents' Opinion on University and Community Alliance

ITEMS	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	% Agreement
1. The University runs programmes and projects that focus on the community	15.56	48.89	8.44	14.67	12.44	64.44
2. The University engages the students into a number of apprentices and outreaches	7.11	37.33	9.78	27.56	18.22	44.44
3. Community response to all University programmes is positive	11.50	50.00	23.45	8.85	6.19	61.50
4. The University has developed a number of partnerships and collaborations	14.22	41.78	20.89	17.78	5.33	56.00
Average	12.10	44.50	15.64	17.21	10.55	56.60

Source: Primary data

From the Faculty of Agriculture; the Orange-Fresh Potatoes project, the GARI project, the resistant cassava project, food stuff preservation project and the tractor hire services were some of the projects mentioned. In the department of Human Anatomy, there was no ongoing community participation mentioned apart from the deployment of student doctors for clerkships in the health center IIIs & IVs, the male circumcision project by the department of surgery, the ENRECA project in Awach Sub-County and the intervention on the nodding disease.

A Chi-Square test was run to establish relationship between institutional financial management and community services. The Pearson Chi-Square value was found to be 164.374 with 25 degrees of freedom and an assumption significance of

0.000 which is less than 0.05. This means the assumption that there is no relationship between institutional financial management and outreach service is rejected.

Institutional financial management therefore has significance on outreach service at 0% level of significance. This supports Management's position expressed above that research, publications and community service are inadequately funded in Gulu University. See table below.

Table 20

Relationship between Institutional Financial Management and Community Outreach in the Science-based Departments at Gulu University

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	164.374 ^a	25	.000
Likelihood Ratio	54.781	25	.001
Linear-by-Linear Association	27.750	1	.000
N of Valid Cases	231		

a. 26 cells (72.2%) have expected count less than 5. The minimum expected count is .02.

The findings of research question five

What is the influence of quality institutional financial management on massification in the science-based faculties at Gulu University?

This research question addressed the following three key questions: Whether departments get involved in the University budget process, if the University funds

departmental requirements fully, and if budgetary expectations of the University are met annually. See table 21 below for detailed analysis.

Table 21

Respondents' Opinion on Institutional Financial Management in the Science-based Departments at Gulu University

ITEMS	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	% Agreement
1. Departments get involved in the University budget process	2.67	9.78	6.67	20.00	60.89	12.44
2. The University funds departmental needs/requirements fully	3.56	8.89	5.33	34.22	48.00	12.44
3. The budgetary expectation of the University is met annually	1.34	11.16	36.61	26.34	24.55	12.50
Average	2.52	9.94	16.20	26.85	44.48	12.46

Source: Primary Data

The opinions of the respondents as expressed in table 21 above indicate that the budgetary process at Gulu University is weird. This is supported by the fact that only 12.44% of the respondents agreed that the departments get involved in the budget process against 80.89% who dis-agreed and 6.67% who remained undecided. This is of course a very serious irregularity in financial management. When the students, lecturers, heads of departments and the corporate managers were asked about the financial management of the institution, these were the responses from each category:

Students

The Students observed that their representatives in the guild do participate in the budget process, but decried lack of implementation of the budget outcome. Responding to the question whether the University funds departmental needs fully, the students observed that most of their expectations were not met. The areas where they felt needed much attention include: improvement of classroom space, procurement of more lecture chairs, computers and accessories and other teaching-learning equipment, recruitment of more lecturers and improvement of internet accessibility. On whether the expectations of their departmental budgets are met annually, the students expressed ignorance, but observed that from their perspective, they don't see much intervention and have always heard complaints from their part-time lecturers on delayed or non-payments for the services they render to the University. They wondered why, in the presence of large numbers of privately sponsored students, the University is not able to implement the budget successfully and cater for their educational needs sufficiently. The table on page 130 represents a picture of how the science-based faculties derive their funding.

Table 22

Respondents' Opinion on Source of Funding for the Science-based Departments at Gulu University

ITEMS		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Government	49	21.2	21.8	21.8
	Students Fees	39	16.9	17.3	39.1
	Endowments	4	1.7	1.8	40.9
	Donors, Friends, Development partners	49	21.2	21.8	62.7
	Not sure	84	36.4	37.3	100.0
	Total	225	97.4	100.0	
Missing	No response	6	2.6		
Total		231	100.0		

Source: Primary Data

Lecturers

The lecturers during their face to face sessions reported that their participation in the budget process has turned lukewarm. They revealed that much of the money approved during the budget process is not reflected in the real needs of the departments to improve the teaching-learning process and facilities. A case in point, which drew my interest, was the scenario reported by lecturers in the department of computer science who observed that the department initiated a computer skills' training project as a self-help project to support in the sustenance and replenishment of computers at the department when they realized the facilities were getting

dilapidated and no interest from the centre was forthcoming to salvage the situation. To their dismay, they reported that when the project kicked-off and started attracting good response from the public and realizing good money, they expected the proceeds from such a venture would be directed towards the replenishment of the computers as was included in the departmental budget, but that was not the case. They claimed that such kinds of attitudes and many others from management is some kind of a de-motivation for positive involvement in the budget process.

The Lecturers' viewpoints corroborate quite well with the results from the questionnaires. In the Department of Human Anatomy only 4.05% agreed that they get involved, 91.89% dis-agreed and 4.05% were undecided. In the Bio-system Engineering 14.04% agreed while 84.21 disagreed and 1.75% were undecided. At Computer Science, 12.64% agreed, 74.71 dis-agreed and 12.64% were undecided. On whether the University funds their departmental budgets fully or meets the departments' expectation annually, the Lecturers had these to report: That there is inadequate support to academics by central administration, that most of their requisitions to improve teaching and learning are not given the priority they deserve, that they are not able to accomplish the programmes' expectations as planned which in their opinion is a great dis-service for the students because some of them pay colossal sums of money to attain quality education and yet what they is not commensurate and that the non prioritization of the academic unit by management is in contravention of the strategic plan, vision and mission statement of the University.

These views tallied very well with questionnaire responses from the departments. In the department of Human Anatomy, the levels of agreement on the two questions issued stood at 4.05% and 8.11%, while disagreement was 91.90% and 54.6% with levels of indecision standing at 4.05% and 37.84% respectively. In the department of Bio-system engineering levels of agreement were 28.07% and 17.54%, while the disagreements were 66.66% and 40.36% with levels of indecision recorded at 5.26% and 42.11% respectively. Records in the department of Computer Science followed the same trend with levels of agreement standing at 8.05% and 13.95%, while disagreement recorded at 85.05% and 51.16% with the level of indecision recorded at 6.90% and 34.88% respectively.

Heads of Departments

The Heads of departments agreed that they do get involved in the budget process. However, they also reported that their participation is not followed with good financial accountability and transparency. They for instance complained that their serious level of involvement is during the process of bringing money into the University's account, but once the money is secured, then their involvement ceases. They further revealed that a lot of money is collected into the University's accounts through the departments, but that remains how far the departments can go.

The Heads of departments further observed that the implementation of the budget is very poor at Gulu University. One Head of department was actually bold enough to remark that their involvement in the budget process is mere window

dressings and has no consequence in as far as influencing the centre to tailor the budget towards improvement of the department is concerned. The areas where he felt were most affected included: Inadequate lecture space; poor facilitation of the teaching-learning process; violation of the departments' budget plans; violation of the departments' procurement plans; the irregularities in paying salaries of part-time lecturers; and the non-recruitment of required academic staff to the extent that operations at the departments heavily lie in the hands of Teaching Assistants, and at times, outside the guidance from senior academicians. The Heads of departments further decried that due to poor attention to the needs of the academics, many senior staff are leaving the institution for better possibilities elsewhere. The figure on page 134 represents respondents' opinions on how they imagined budgetary implementations and prioritization are considered in the science-based faculties.

Prioritization of funding

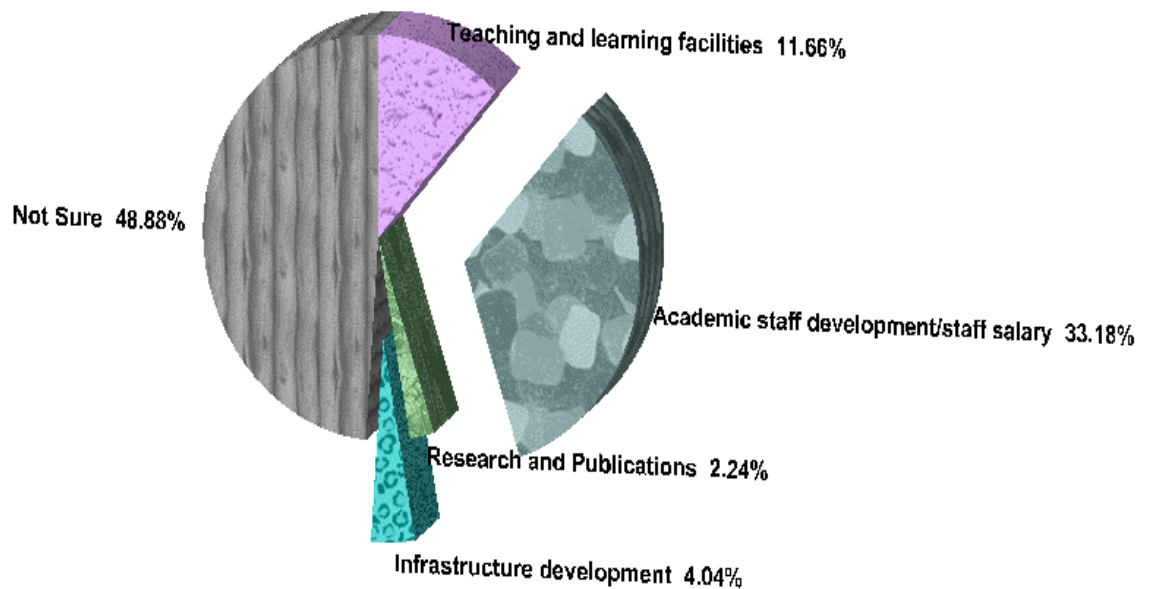


Figure 7. A pie-chart showing priority areas of funding in the Science-based faculties at Gulu University

Corporate Managers

The Corporate Managers accentuated that the budget process is still challenging in the University. They observe that a lot of awareness needs to be created in all the sectors of the University about the budget process and cycle. They revealed that their serious drawback in the budget process is mobilizing the stakeholders to participate in the budget process and observe the budget cycle. The researcher was informed that the Deputy Bursar in charge of budgets in the University, in accordance with the Budget Act, 2001, article (5) and the UAOTIA, 2003 with amended Act, 2006,

article 62 (1) and (2), tries to involve the University Community in the budget process every financial cycle, through memos and organizing budget review workshops, but sometimes his efforts are laid to waste. In the collective opinion of the Corporate Managers, the budget process is most slowed down at the departmental levels; a problem which they noted must be dealt with.

Chapter Five: Discussions, Conclusions and Recommendations

Introduction

This study was conducted to investigate the use of the National Council for Higher Education quality benchmarks in the management of massification in Science-based Faculties at Gulu University. Five objectives were aligned and achieved through responding to equal numbers of corresponding research questions. This chapter discusses the outcomes of the findings presented in chapter four in conjunction with information derived from the introductory chapter and the literature review in context of the objectives and research questions. Conclusions and recommendations were all drawn in line with the research objectives. In conclusion, areas for further research were suggested.

Discussion

Research question one

To what extent is massification experienced in Science-based Faculties at Gulu University?

Results to this question revealed that the Science-based Faculties at Gulu University are experiencing incidences of massification. The four key aspects which were highlighted by the respondents as indicators of massification were: Unplanned and rapid expansion in students' numbers which result into which result into congestion in the classrooms, rush for teaching-learning facilities by the learners, high students' to lecturer ratio, lecturers' fatigue, and delayed assessments of learners' work amongst others. It also results into inadequate educational infrastructure

(classroom space, library and laboratory space), inadequate education resources (textbooks, chairs, computers and other teaching-learning equipment) as well as the unplanned development of faculties, departments, programmes and the entire growth in the curriculum.

The underlying reasons for this explosion quoted in *The Economist's*, 2005 (cited in Mohamedbhai, 2008) are fourfold, namely: The democratization of education, the rise of the knowledge economy, the phenomenon of globalization which is turning higher education into an export industry, and the competition, for students, funds and research grants. These four underlying factors are vindicated in the report by all respondents that expansion in students' numbers especially in the departments of Computer Science and Human Anatomy are being experienced. Consequence to this, needless to mention, was the upshot of high equipment to student ratios as well as students to lecturers ratios. These situations greatly infringe on the teaching-learning process and especially in the management of practical sessions which culminate into class congestion and learners rush for the share of required facilities.

Furthermore, vital to reiterate, a research carried out by the Federal Ministry of Education in Abuja, Nigeria (2005) on the status of education in that country, authenticates that overpopulated classrooms are considered to be un conducive for both teachers and students when it comes to the issue of continuous assessment marking and the ability to give individualized attention to students needing extra help and vice versa. In addition, Arikewuyo (2005) vied that the quality of education in an in-

stitution is determined by the institution's availability of education resources. The above stance is re-enforced by Onwo (1998) who asserted that class size is a big factor in determining the attainment of educational goals and objectives. Edge (1980) yet to accentuate this point reported that teaching writing skills in large classes without the provision of an opportunity for discussion or any kind of oral input to the written work is difficult. Powell (1969) appends that, large numbers of students in a class allow almost no opportunity for genuine exchange of opinions or arguments.

Musisi et al., (2003: 43) cited in the Uganda Vice Chancellor' Forum [UVCF] (2013), re-echoes the foregone statement in a report issued by the Makerere University Academic Staff Association which found that more than half the registered students in some courses did not attend lectures because of lack of seats and poor audibility in the lecture halls. Such insufficient facilities and high student-lecturer ratios compromised academic quality as the report noted.

Confirming the foregone, the NCHE (2011) interpolates thus:

"There is little money for educational inputs. Study areas (classrooms, laboratories and libraries) are overcrowded because of a mismatch between student numbers and facilities...there is little money for the maintenance of the infrastructure and few institutions have comprehensive internal quality assurance mechanism."

The study considers this scenario as being a total wipe out of the broad aims of

education enshrined in the Uganda Government Education White Paper (1992), which stipulated that promotion of scientific, technical and cultural knowledge, skills and attitudes are prerequisites needed for development. Contravention of such policies thus negates the fortitude to promote scientific and technological skills required for the modernization and industrialization of the economy. Cognizant of these challenges, the researcher in line with Prof. M. Craig (cited in B-HERT NEWS, 2003), suggests curative strategies that may be adopted to address the scenario of inadequate facilities against high students' numbers which include amongst others; creating learners' practice-shifts and adopt a more learner-centred approach in conducting lectures, assigning progressive tasks to the learners, whose achievements not only perfected learners' skills, but also improved their in-depth knowledge in the subject matter, and thirdly encouraged learners to study in multiple settings; in large lecture halls, in groups on collaborative exercises, in computer laboratories with two or three others in an online tutorial, or simply working at home alone applying the self directed learning strategy.

In the area of inadequate educational infrastructure the study exposed that the Science-based Faculties at Gulu University and indeed the whole University is experiencing a serious infrastructure problem; with very few of the infrastructure customized to suit the purpose for their current usage.

In support of this state of affairs, the Visitation Committee on Public University [VCPU] (2006) elucidates thus:

“The rapid expansion being experienced by universities has not been matched by a corresponding increase in physical and educational facilities or human and financial resources...to the detriment of quality education provision”. Similarly, the NCHE (2011) in their report accentuated that the increase in enrolment has created many problems; foremost among them is a drop in quality”.

The researcher thus wishes to interpolate that this is inexcusable because Science is a specialized discipline whose deliveries should be undertaken in well gazetted and designated areas using appropriate and relevant equipment if its core objectives have to be realized. Another drawback revealed in this research has been; the unplanned development of faculties, departments, programmes and the entire growth in the curriculum. Programmes are increasing, more departments created and the curriculum growing, but with little commensurate development of the infrastructure. Students’ numbers have more than doubled or tripled in certain instances, but facilities remained unimproved or makeshift structures developed.

Needless to mention, the Visitation Committee Report on Public Universities in Uganda (2006) noted with regret that the state of facilities in all our public universities are either broken down owing to lack of repairs and maintenance, short in supply, out-dated or the laboratories are too small to accommodate the ever increasing numbers. To underpin this point, the committee was emphatic that; for any modern university to deliver quality education, it must have adequate educational resources

including books, journals, scholastic materials, computers, including; internet access, lab/workshop, and opportunities for field work and industrial attachments.

To electrify further this argument, section 5 (1) of the University and Other Tertiary Institutions Act (2003) stipulates that all courses and programmes must be taught by sufficient and qualified staff using adequate education facilities in safe and accessible physical structures. Further attention to underscore the foregone statement stem from Statutory Instrument 2005 Nos. 80 and 85 of NCHE (2011) which drew special attention to; access to relevant and up-to-date text and other books as well as articles in journals; access to computer networks and the internet; access to general educational equipment, including power point projectors, slide projectors, overhead projectors, video, video cameras, flip charts, typewriters, television sets, public address systems, etc; access to sports and recreation facilities; and Students exchange programmes to enhance student experiences as trademarks of worthwhile educational system.

Mohamedbhai (2008) still reiterating on the effects of massification of higher education in Africa, revealed that there were very few innovations reported by African higher education on issues concerning optimal utilization of space, students' accommodation and the maintenance of physical facilities. Heinemann, Jamison and Montenegro (1984) highlighting on the issue of textbooks availability and other factors in students' learning in South-East Asia found that, such facilities impact on students' achievement. In their study, they found that provision of better textbooks and increase of ratio of textbooks to pupil can have significant improvement to student achievement. To

further augment the above postulation, the Education Policy Review Commission EPRC (1989) and the Ministry of Finance Planning and Economic Development MFPED (1994) identified instructional materials, particularly textbooks, as the most cost effective way to improving quality of education because they provide learners with information on various disciplines and thus enabling them to acquire new knowledge that is put into use in solving educational problems.

Nhundu (2008) while underpinning the same position subscribes that “rapid increase in higher education enrolments raise serious concerns over the quality of education, especially considering that diminishing sources of public funding have resulted to the neglect of key inputs to teaching and research and prompted private sector participation and commercialisation of higher education.

Before winding up the discussion on this research question it must be castigated that massification is real and complex and must be treated as a running challenge in higher education. The researcher also wishes to draw management interest to delve more into the extent of massification in higher education so that they do not only view it entirely as negative consequent, but also plough from its advantages. Massification must not only be comprehended and equated with increasing numbers at enrolment, but go a long way to address other salient issues like; what should drive programmes’ development in universities, how should universities balance the question of education resources with the continuous growing population, what methodologies should be used by lecturers to convey the content of their instructions and lectures to

large classes without getting stressed and the learners not complaining of shoddy work, what assessment formats should lecturers use without causing undue fatigue to themselves and also achieving the desired objectives.

Conversely, the advantages of massification which amongst others, increases revenue to the University's coffers as well as the pulling of various physical human talents to the University must help to improve the budgetary demands of the institution, improve the financial outflows and must make the University viably competitive in the socio-cultural arena.

Research question two

How has university autonomy and governance influenced management of massification in the Science-based Faculties at Gulu University?

Respondents' views to address this research question were solicited through table 13 in chapter four on page 88. In particular the state of Gulu University governance and autonomy were scrutinized.

Autonomy applied to universities, concerns itself with the relative ability of the institution to govern itself without outside control. Autonomy can be granted by law or through the financing system. According to Goedegbuure (1993), the power of the University or College to determine its own goals and programmes is Substantive Autonomy, while Procedural Autonomy is the power of the University or college to determine the means by which its goals and programmes will be pursued. The

researcher expounds that whether the former or the latter, autonomy and governance must target Total Quality Management (TQM) and the enhancement of Corporate Governance.

Important to report is the questionnaire results obtained from all the 231 respondents, who gave their opinion on question 1 of table 13, which sought to find out whether Council and Senate are properly instituted organs at Gulu University, at least 65.5% of the respondents shared common opinion that the organs of Council and Senate are properly instituted at Gulu University. This meant that the formation of Council and Senate conformed to article 38 (1) and 44 (1) of the Universities and Other Tertiary Institutions Act (UOTIA), 2003 as amended 2006 respectively.

Needless to explicate, council and senate are the two key organs on which management and administration of the University rest. Both Council and Senate discharge their mandates through their committees. Council committees include: Appointment's Board, Finance, Academics and Students' welfare, while Senate committees are: Admissions Board, Quality Assurance and Examinations, Academic Programmes, Awards and Research and Publications. The study findings pre-supposed that Management and Administrative functions of the University are handled in accordance with the Act, which is the hallmark of autonomy and governance in a University's setting. Respondents however castigated that at times the system's response to address issues does not conform to expectations of the stakeholders.

The underlying principle here is that; Universities and other institutions of higher learning are complex organisations which serve a multiplicity of purposes in form of goals and strategic objectives which also shape the direction how they are to be governed. Digging deeper into this statement, it measures up to Passi (1994) who postulated that the University, like many formal organizations, faces the common problem of delays in decision making. Karr (1987), states that, the authority pattern of a university lacks a well-defined chain of command. What exists explains a collegial partnership between the Vice Chancellor and faculty members. This is explained through the proper representation of the staff and students' union on both Council and Senate as vindicated through questions 2 and 3 of table 13 on page 88, where 68.5% and 77.7% respectively attested to the institution of collegiality in the University management. Tagg and Howell (2005) and Baldrige et al (1978), cited by Ssettumba, consolidates this position, which depicts universities as "organised anarchies and loosely coupled".

In the OECD countries for instance, University Autonomy and Governance are determined across eight areas:- Ownership of building and equipment, borrowing of funds, expenditure of budgets to achieve objectives, setting of academic structure/course content, employment and dismissal of staff, setting of salaries, deciding on students' enrolment and determining of tuition fees (OECD, 2003). In Uganda, this corporate responsibility has been highlighted in the Quality Assurance Framework for Uganda Universities and they emphasized the following themes: Admissions and dismissal of students, hire and fire of staff, design and

implementation of Curricula, setting and charging of fees, setting and marking examinations, award qualifications and proposing and implementing the University budget (NCHE, 2006 No. 7).

Governance in the context of University education, on the other hand, deals more with the crucial and critical role higher education plays today, not only in the promotion of democratic culture and institutions, but also in transforming the world into a global institution (OECD, 2003). Q4, through to Q12 on table 13 on page 88 prominently dealt with governance related matters. Q4, 5, 6 and 7 measured the execution of corporate responsibility on service delivery. Unfortunately the respondents' views indicated that corporate responsibilities of both council and senate need to be strengthened. 37.6%, 25.0% , 40.6% and 34.7% respectively were responses that lay bare Council's and Senate's performances at Gulu University.

These percentages of the responses are low and cast doubts on the merits of corporate governance. These responses when corroborated with responses of Q2 of the interview schedules also yielded similar results. According to Cooke and Slack (1991), taking part in decision-making builds a sense of ownership and consequent determination to put the decision into effect. On the other hand, Isoke (1997) cited by Ssettumba (Ibid) argued that involvement in decision making encourages employees to trust the organization more than the decisions made. In Uganda, the University and Other tertiary Institution Act is the legal framework on which governance of higher education hinge (NCHE, 2011).

Collis (2004), defined governance in higher education as “the structure and process of decision making” and “the establishment of policies to guide (the work of the institution) as opposed to the daily management and administration of the institution. The researcher agrees to Collis (2004) underpinning that governance is a complex and demanding mission which only does not involve manipulation of the legislative framework, the characteristics of the institutions and how they relate to the whole system, but also how money is allocated to institutions and how they are accountable for the way it is spent, as well as less formal structures and relationships which steer and influence behaviour.

Eurydice (2008) on a similar note accentuates that the governance structure of an institution tells us how stakeholders (including the Executive Head of the Institution, Staff, Students, Parents, Governments, Lay persons, etc.) communicate with each other; who is accountable to whom, how they are held accountable and for what. Eurydice’s opinion was subtly expressed in the responses gathered through the section of the questionnaires on quality Autonomy and Governance at Gulu University.

The NCHE (2006, p. 18) draws attention that well-governed Institutions of higher education have strong “institutionalism”, with functioning structures like University Council, Senate, Faculties, Departments and Unions whose powers, or limits of it, are well defined. A well-governed Institution does not only depend on the

charisma or the strength of the leaders. It depends, above all, on its own institutional strengths embedded in its structures, traditions, rules, achievements and viability (NCHE, 2006, p.19). In Gulu University, this notion was confirmed in the results of the study by majority of the respondents. This position underscores the fact that the traditional model which constitutes governance at higher education is broadly collegial and consultative.

In view of the foregone, therefore, universities around the world have tried to position themselves around their major themes and address development needs as well as market situations in their own regions and answer global expectations guided by regional quality standard or frameworks.

In the Commonwealth countries, for instance, most governments since the late 1970's have promoted a climate of critical self-assessment within their higher education sectors. This focus was extended to include the improvement of efficiency and effectiveness and an increased awareness of public accountability. This means therefore, that there is great need for our universities to appreciate self-assessment, general appraisal and evaluation within the universities.

The United Kingdom's and the European Union's perspective hinge so much on the Sorbonne and Bologna declarations (UNESCO,2004) which targets to ensure that European higher education is competitive internationally, with clear objectives aimed at increasing mobility and employability of European cultural diversity and therefore also

respecting the diversity of higher education. In South Africa, the work of the Higher Education Quality Committee (HEQC) of the Council on Higher Education (CHE) has to provide judgement for the efficient and effective management of quality in their Universities (Singh, 2004). In Uganda, the National Council for Higher Education (NCHE) was instituted in 2001 under the Ministry of Education and Sports (MoE&S), its mandates amongst others were; to provide regulatory measures, provide checks and balances and maintained standards (MoE&S, 2005). The council developed the Quality Assurance Framework for Uganda Universities (NCHE, 2006) with the main focus addressing the following related themes: Institutional Governance, Quality of Teaching and Learning, Quality of Academic Staff, Sufficiency of Educational Facilities, Research and Publications, the Quality of Inputs and Outputs and Institutional Financial Management.

The study has revealed that management framework and its structures are properly instituted at Gulu University in accordance with the Act. Conversely, the study also revealed that these framework and structures are at times miss-represented by the implementers to the detriment of the system's quality attainment.

According to Mulford (1998) and Chrispeels et al. (2000), it is only when leadership teams learn to work together and make and implement decisions that they begin to genuinely address students' matters. The challenge which remains to be addressed hinges around the intransigency of the managers at university levels to cope with appropriate corporate management dynamics, comply with institutional

frameworks and adopt participatory engagements of all stakeholders to respond to situational challenges especially the emerging threats of massification and cause changes that can satisfy the institutions' vision, mission and strategic goals and objectives.

Research question three

To what extent has efficient and effective teaching and learning influenced management of massification in Science-based Faculties at Gulu University?

RQ3 was answered by data drawn from table 14 and 17 on pages 94 and 103 in chapter four. The tables focused on the quality of content delivery and students' learning as well as evaluation of the lecturers.

Teaching, learning and assessment are processes through which educational objectives and goals are achieved. They serve the aims of education, which amongst others is acquisition of knowledge, skills, habits, values or attitude (World Book Inc, 1994), which should cause an enduring change. Teaching, learning and assessment form core facets of any education system.

According to the theory of Classical Conditioning by Skinner (1974), teaching and learning is a function that should cause a change in overt behavior. It further explains that changes in behavior are results of an individual's response to events (stimuli) that occurs in the environment and that a response must produce a

consequence that yields problem solving. However, the researcher notes that today, the quality management of teaching and learning appears a far-fetched reality in the state of higher education in Uganda due to the challenges posed by massification.

In table 14 the areas of weaknesses and strength in the quality of delivery, general learning situation and evaluation of lecturers in the science-based faculties stemmed out. The areas of weaknesses should draw attention to management that educational objectives and goals are not being achieved as stipulated. The areas of key concerns are: Non conformity to the semester schedule, Non observance of the NCHE standards that guide teaching and learning, Inadequate implementation of the curriculum, and lack of appraisal of lecturers by both students and heads of departments.

Pointless to reiterate, these omissions undermine the core of the curriculum and contradict Diana's (1994) conjecture that; "in higher education and in education generally, the quality of teaching and learning is paramount without which there is no legitimacy for any educational institution". To confirm these hold-ups, results obtained from the questionnaires and through the face to face interviews reported that lectures at the University do not start promptly at the start of the semester because both students and lecturers do not report promptly to the University. They reported that lectures always start either after two or three weeks from official opening of the semester. This therefore implies that the semester gets reduced to 14 or 15 weeks

instead of the expected 17 weeks. The serious implication of this is that the subject content for the period is not covered adequately or the lecturers have to rush through their schedules in order to cover their course outlines. This is of course very unfair to the learners, government and the entire society because the output from this kind of education practices will come out unbaked and unprepared for the economy's human resource expectations.

As if to confirm the preceding statements, Sunal, W. D et al's (2007) study reports revealed that; "traditional pedagogical approaches of Instructors in undergraduate introductory science courses do not work effectively with many of today's students..., helping students understand ideas is a complex task. Doing it well takes a significant amount of Instructors' knowledge and skills... Science Faculty have little, if any, professional training in teaching especially to handle large classes."

The foregoing states of affairs stand on the path of Shaeffer's (1992) assumptions that viewed quality in terms of proper organisation of a lesson/lecture, the correct use of texts and home work/assignment, the encouragement of child-centred learning, the absolute amount of time spent on tasks and so on. In the same vein, the researcher opines that customers of higher education who range from government, parents, sponsors, to employees will discredit the quality stance of the institution.

The second finding of this research question to which attention must be drawn is that the NCHE quality standards are not very familiar to the students, lecturers and administrators in the science-based faculties at Gulu University. The study revealed that these documents are not readily accessible in the offices at departmental levels. Some lecturers did reveal during their focus group discussions that they have not yet even seen what the pamphlet looks like, but sometimes hear about it during workshops organized by the Academic Registrar's office. It is therefore hereby propounded that the inaccessibility to these quality benchmarks by both the managers of higher education and academics, deny them the chance to acquaint themselves with standard operational procedures to the extent that detection of a negative development in the learning situation may be impaired.

Turning to the question of evaluation, the overall responses from all sections; the questionnaires, interviews and focus group discussions reveal that neither the students nor the Heads of Departments (HoDs) carry out evaluation at their respective levels. Questionnaire responses to management report presented in table 14 on page 94, with respect to evaluation by HoDs on lecturers, show that only 28.81% of Management agreed that HoDs carry out evaluation of their lecturers against 55.7% level of agreement and 15.70% level of indecision.

To interject on this point, the researcher advances Bigg's (2003) assumptions reviewed by Paulo and Bota's that; quality of teaching in higher education relies upon what students do both in and outside the classroom. He claimed that at last a shift has

occurred in the focus of teaching and learning from what teachers do to what students do in the classroom in higher education. He argued that this shifting is liberating so long as the quality of teaching can be enhanced by aligning objectives, teaching styles and continuous evaluation.

In B-HERT NEWS (2003) a renowned educationist had the following to comment about the importance of Teaching and Learning at University education.

Here are excerpts:

According to Professor M. Craig, Centre for the Study of Higher Education in the University of Melbourne, the importance of Teaching and Learning in Universities has shifted from routine and somewhat token acknowledgment in government policy to a central place in the higher education policy agenda. To him, Students are now more likely to study in multiple settings: in large lecture theatres, in groups on collaborative exercises, in computer laboratories with two or three others in an online tutorial, or simply working at home alone. The researcher believes that if Craig's assumptions were translated to actions, then there would have been no reason for the study because tendencies of massification would have been detected and controlled from escalating in the science-based departments at Gulu University.

Professor R. Dawkins of the University of Oxford, however, thinks that the Oxford Tutorial is better than any alternative offer, because it emphasises the virtues of individual attention, and the one-to-one focus on Learners. Mr Robin Lane Fox, Fellow in Ancient History new College, Oxford and admirer of the Socratic Method also thinks that

the Oxford Tutorial system is the best because it brings one or two learners into contact with a single teacher in their subject and provides them an opportunity to think together. The Oxford Tutorial system also received a positive applaud from the students, thus: "Tutorials continue to play a prominent part in the life of any student at Oxford and there is no doubt that they think about them a great deal, how they work (and sometimes do not work) as a way of learning and teaching." The learners further commented that there is a danger that with the decline of one-on-one teaching, the opportunity to offer the kind of detailed, in-depth advice to an individual that was always a distinctive feature of the traditional tutorial is lost. Again it is vindicated in the last statement of the forgone paragraph that massification draws away the principles and merits of good teacher to student interactions and subject them to jeopardy.

Professor Bain. K; Professor of History and Director, Centre for Teachings Excellence, New York University, on his part intervenes: "The best teachers conceived of teaching as anything they might do to foster sustained and substantial changes in the way students think, act, or feel without doing major harm...one can't teach well by the numbers anymore than one can expect to become a great artist by painting in that fashion. Excellence in teaching requires deep thoughts and often profound and subtle changes in the way we think about the nature of both teaching and learning." On the part of the Learners, many factors shape the quality of learning. These include the aptitude and motivation of individual students and their own approaches to learning (including to collaborative learning), the quality and diversity of the student body of

which they are part, the curriculum they study, the calibre and strategies of those who teach them, the size and nature of their classes, the ways in which learning is encouraged by the assessment processes and feedback, the learning resources available and used, the scope for learning in the classroom to be enriched by learning outside the classroom (including in residential and extra-curricular settings), and the wider Institutional and social context. Heedful of the dangers of massification, the above statement draws attention to workable strategies that may be used to offset the ills of massification.

To surmount the challenges addressed above therefore, Managers of education at University level should pull up their socks and draw operational strategies which will enable attainment of quality at any cause. The second important issue to address should be the operationalization of standard academic policies to yield expected results; the NCHE quality benchmarks, the semester credit system regulations and the programmes' guidelines. Thirdly, massification in education with its complexities must be addressed in terms of continuous innovation and education resource viability amongst others.

Turning to the subject of academic staff, what was prominently noted by all the respondents were that: The number of academic staff in science-based faculties at Gulu University are inadequate to marshal the expected tasks, There are very few staff members at Masters and PhD levels, The majority of the Lecturers in Gulu University science-based Faculties are Teaching Assistants, There exist very wide establishment

gaps to be filled in order to create the human resource stability in the Science-based Faculties at Gulu University. Corroborating then the foregone to the NCHE (2006) underpinning that the quality of academic staff is key to the quality of any University Education, it is easy to appreciate the fact that the level and quality of academic staff in the science-based faculties still remains insufficient and inadequate. The University and Other Tertiary Institution Act, Section 119 stipulates that “No University or Tertiary Institutions shall employ a Lecturer, Instructor or other person recruited for the purpose of teaching or giving instructions to Students whose qualifications do not conform to the standards set by the National Council regulations”. According to Prasad et al (1997), recruitment is the art of attracting applicants from whom the most suitable ones may be selected. At university level, staffing matters are handled by the Appointment’s Board committee, which is a sub-committee of the University Council. Different countries and Universities in the world have set up different terms and conditions to manage their Academics and other staff. Eurydice (2008) avails the following experiences:

In Denmark, Universities are free to determine the number of available positions for Academic Staff, but they must, however, respect a maximum limit for the number of Professors, which is established by the Ministry of Finance. The Ministry of Science, Technology and Innovation then distributes the chairs among the universities. Overall, the recruitment procedures are established by Ministerial order, with universities being responsible for the recruitment procedure as such. In Estonia and Latvia, Institutions are directly responsible for the appointment of staff (choice of the num-

ber and distribution of categories of staff among the different departments), whereas the official regulations state the general and specific recruitment criteria (profile, degree(s) required, previous professional experience, etc.) for each category of Teaching Staff. In Spain, Universities decide on the number of available positions (teaching and others), whereas the selection criteria and conditions for access to permanent positions are based on the official regulations in force at national level. Furthermore, Public Universities have wider scope for decision-making as regards the recruitment of Administrative and Non-Teaching Staff. In Malta, according to the Law on higher education, the University and the *Malta College of Arts, Science and Technology* (MCAST) is responsible for determining the number of posts required. MCAST has set its own recruitment criteria for different categories of staff. However, with regards to the composition, Academic Staff in the University sector is characterized by considerable gender differences (Jensen, 1997; Ståhle, 1998). In Science and Engineering the proportion of female staff is predictably small, but in areas such as the Humanities, Law and Medical Science, where the majority of Students are now women, men continue to dominate the Teaching Staff, especially at the tenured levels (UNESCO, 2004).

Yandila (1995), in furthering this point, observed that academic quality was deteriorating in African Universities and that staff recruitment was difficult particularly at senior levels. He thus recommended that the African Universities should be very creative in attracting staff for without them; they cannot play their role of human

resource development. To support the foregone argument, it was found that out of the 23 Gulu University lecturers who participated in the study, only one of them was female and just at the rank of a Teaching Assistant. It was also realized that the number of staff with master and PhDs were still few. This is a reality that the science-based faculties and indeed the entire University must try to overcome and address by supporting female based scholarships and affirmative recruitment drives as well as send more academics to attain higher degrees. The researcher further contends that drawing from these various university cultures around the globe, the science-based faculties can adopt a workable strategy of building up their staffing capacity at Gulu University more especially to target universities' challenge of the 21st Century, of which control and management of massification feature amongst the priorities.

The Romanian Agency for Quality Assurance in Higher Education (ARACIS), set up in 2006, postulated that the quality of education provided to the students relies on the quality of academic staff, as a result of the analysis of three components: students' assessment, peer assessment and institutional assessment of the teaching staff. It is therefore crucial for institutions to attract, recruit, develop and retain quality academic staff. With teaching assuming an increasingly important role, Mohamedbhai (2008) illuminates that several of the Universities worldwide have realized that it was important to train staff in pedagogical and other University skills, especially as they have to deal with large cohorts of students. In Kenyatta University for example, in 2004, a centre for University pedagogy was created to train teachers how to deal with large groups of students.

At the University Eduardo Mondlane all Mozambican lecturers are required to undergo training in teaching skills. The training was introduced in 1989 through a long-term collaborative project with a Dutch University, financed by the Dutch government. Apart from teaching methods, which is the 'core' course and includes techniques of handling large classes, other courses offered by that centre are: students' assessment, conducting laboratory sessions, curriculum development and materials development. Attending at least one of these courses, essentially the 'Teaching Methods' one, has been a compulsory prerequisite for the promotion of full-time Junior Lecturers.

Subscribing to the above enunciation by Mohamedbhai (2008) the researcher strongly advises managers of universities in Uganda and especially those of Gulu University to embrace good practices adopted by other universities in the region to improve content delivery in the face of massification so that the lecturers and the Learners may enjoy their class interactions and especially during the teaching of science practical. Whereas the above postulations may be true, the researcher is opined to suggest that in a young growing University like Gulu, with infant faculty history and lean on academics in all aspects, the University must emphasize progressive modelship, academic mentorship and pedagogical support training for the young academics as well as cautious growth and development so that the achievement of the University's core functions unfolds to the satisfaction of desired quality standards and

expectations; and the challenges posed by massification in the science-based faculties get correctly managed. Addressing the state of sufficiency or insufficiency of educational resources in the science based faculties at Gulu University, respondents' opinions were sought through eight parameters which included: library reading space, library texts, library chairs, classroom space, classroom chairs, laboratory space, laboratory chemicals and laboratory equipment. These parameters were identified because they form the core facilities required in a teaching-learning environment. To draw the expected data therefore, respondents' opinions were tapped using the following cues: Adequate to mean (Readily Available), Satisfactory to mean (Can be accessed), and Inadequate to mean (Difficult to access).

The analysis of questionnaire results from all the 231 respondents who participated in this study revealed that the science-based departments are in short supply of the required educational facilities. The average score on all the eight parameters under the key cues were as follows: adequate 13.98, satisfactory 25.47 and Inadequate 60.54 respectively. Results from the in-depth interviews with key informants; Deans, Heads of departments and Corporate Managers as well as from focus group discussions with students and lecturers all castigated the severe inadequacy of educational facilities the University is experiencing. They contended that the ever increasing numbers of Students without commensurate increase in physical facilities is the major cause of the poor state of affairs. The areas they considered hard hit include: lecture space, chairs, computers and accessories, equipment and specimen in the laboratories, library texts and internet connectivity. These findings corroborate

well with the position advanced by (Edqual, 2005) that in Sub-Saharan Africa, many governments are still unable or unwilling to make appropriate resource commitment at higher education institutions that is proportionate to student numbers. As a result, resources that are made available to support rapid growth in these institutions, including equipment, buildings, staffing and staff time and benefits, are not adequate to maintain the quality of programmes and Students' learning experiences. This is severely undermining the commitment demanded of higher education institutions to produce highly skilled, mobile, and globally competitive workforce that is able to adjust to a rapidly globalising world economy.

The VCPU (2006) noted with regrets that the state of facilities in all our Public Universities are either broken down owing to lack of repairs and maintenance, short in supply, out-dated or the Laboratories are too small to accommodate the ever increasing numbers. It further noted that the increase in students' numbers has not been matched by a corresponding increase in physical and educational facilities or human and financial resources...to the detriment of quality education provision. The Committee was emphatic to observe that for any modern University to deliver quality education, it must have adequate educational resources including books, journals, scholastic materials, computers, including internet access, lab/workshop, and opportunities for field work and industrial attachments. To address the shortage of facilities especially in the department of Computer Science, Learners are being encouraged to acquire their own laptops, adopt on-line studies and possibly possess kindle E-book readers.

According to Kulazikulabe (1978), education institutions in Uganda sometimes lack even the minimum of required educational materials of all types. Where they exist, they are insufficient or even sub-standard. Shaeffer (1992), on the other hand advances that quality in education is explained in terms of inputs, outputs and processes. Inputs including materials: class building, desk, chalkboard, textbooks, and laboratory equipment as well as Teachers and students whose quality is often measured in terms of qualification of teachers, text books relevance and students' intellectual and nutritional status. The VCPU (2006) upholds that Key components to teaching and learning are quality of the educational resources and academic staff.

Heinemann, Jamison and Montenegro (1984) while discussing textbooks availability and other factors in Students' learning in South-East Asia found that, such facilities impact on Students' achievement. In their study, they found that provision of better textbooks and increase of ratio of textbooks to pupil can have significant improvement to Students' achievement. These studies indicate that learning and reading materials are extremely important in knowledge dissemination. To augment the foregone postulation, the Education Policy Review Commission EPRC (1989) and the Ministry of Finance Planning and Economic Development MFPED (1994) identified instructional materials particularly textbooks as the most cost effective way to improving quality of education because they provide Learners with information on various disciplines and thus enabling them to acquire new knowledge that is put into use in solving educational problems.

Section 5 (1) of the Uganda's University and Other Tertiary Institutions Act (2003) stipulates that all Courses and Programmes must be taught by sufficient and qualified staff using adequate education facilities in safe and accessible physical structures. The NCHE requirements set out in Statutory Instrument 2005 Nos. 80 and 85, drew special attention to: Access to relevant and up-to-date text and other books as well as articles in journals, access to computer networks and the internet, access to general educational equipment, including power point projectors, slide projectors, overhead projectors, video, video cameras, flip charts, typewriters, television sets, public address systems, e.t.c, access to sports and recreation facilities, and Students' Exchange programmes to enhance student experiences. In view of the fact that there is inadequate supply of education resources especially text-books across the academic divide, and especially in the science-based faculties at Gulu University, the researcher proposes probable measures the University should plan and propagate for. These include: Being strict on the operationalization of the fees structure, so that money voted for specific items like; development, text-books, computers, etc, really go towards satisfying what they are meant for, there may be need for the University to introduce the students to the use of kindle readers to supplement other reading resources, and enrolment of students should be guided by availability of facilities cautiously guided by the standard dictates in the NCHE standard benchmarks so that massification is successfully managed.

Talking about required ratio the researcher ends discussion on RQ3. Oxford

Advanced Learner's Dictionary defines ratio as the relationship between two groups of people or things that is represented by two numbers showing how much larger one group is than the other. In a teaching-learning environment, the ratio of learners to teacher is paramount and crucial. According to UN (1973) report, it is accentuated that a teacher gives maximum attention to the Learners when the pupils-teacher ratio is low. When the Teacher pays little attention to the pupils, the level of performance is greatly affected. Thus, as the pupils' enrolment increases, there is need to increase teachers' recruitment as well. UNESCO (2000) recommends that Students' population in a single classroom should not exceed 1:30, or at most 1:35 in order to foster provision of quality teaching and learning. However, due to increased enrolment at all levels of education, this numbers are too few to call.

Whereas the discourse advanced by UNESCO (2000) in the foregone paragraph, is an earlier research position, it is important to draw caution that enrolment in the science-based disciplines at University level must not just be guided by such ratio principles or justification, but rather implemented based on adequacy of educational resources and facilities. Onwo (1998) contends that the class size is a big factor in determining the attainment of educational goals and objectives. While Edge (1980) in his study reported that in large classes, the provision of an opportunity for discussion or any kind of oral input to the written work is difficult. Similarly, Powell (1969) observed that, large numbers of students in a class allow almost no opportunity for genuine exchange or arguments and opinions.

In Uganda, the NCHE has developed general checklist of quality and capacity indicators for assessment of Universities and Programmes (NCHE, 2011 pg 32, 33). In this framework, parameters for assessment have been identified under five descriptive headings: **Ideal; Good; Acceptable; Can be improved** and **Unacceptable**. According to the NCHE (2005), the lecturer/student ratios are among the indicators of quality education in any modern university. In the developed countries, the Lecturer/Student ratios in higher education institutions range from 1:12 in Japan to 1:18 in the United Kingdom (OECD, 2003). In Uganda, the NCHE has set the general Lecturer/Student ratio at 1:15 (Statutory Instrument 80 of NCHE, 2005). Important to note is that Mbarara University of Science and Technology (MUST) and Gulu University had the best Lecturer/Student ratios at 1:8 and 1:12 respectively (VCPU, 2006), which in the terminology of the NCHE is rated good and arguably would imply that quality standards should be higher in MUST and in Gulu other than in any of the Public Universities, taking all factors constant.

Notwithstanding the above conjecture by the NCHE, it is worthwhile stating that this ratio debate must not stand in isolation of other factors; classroom, laboratory and library space specification as well as laboratory equipment and library text and other educational resources. Ratios for various subject discipline areas in practice at international level were indicated as here stated: Human and Veterinary Medicine 1:8; Science/Technology 1:10; Arts/Humanities 1:15. The ISURA (2012) revealed that in one of the systems practiced in the United States of America (USA), the ratio of cadaver to students stands at 1:2 maximum 1:3. Furthermore the University of Medicine and

Health Sciences UMHS, Saint Kitts and Nevis (2012), puts the ratio at 1:5. The NCHE has sometimes used students' enrolment versus the number of books at public universities in Uganda to explain deviation from the expected. The most recent statistics was developed using the 2005/06 enrolment figures, where Gulu University book/student ratio was quoted at 1:3 (NCHE, 2006). However, with the ever increasing numbers of students at enrolment and the continued ceiling on staff recruitment, coupled with inadequate facilities, the researcher Propounds that Lecturers should adopt new skills of conveniently reaching their Learners, these amongst others include: Splitting the class into small learning and study units, setting clear and specific teaching- learning objectives, continuous assignment of study tasks followed by concurrent evaluation, continuous assessment of learnt tasks, and above all being a Lecturer who loves his work and the achievement of his learners.

Research question four

To what extent has research, publications and community service influence the management of massification in the science-based faculties at Gulu University.

Respondents' views on the research question were summarized on table 17 on page 103 in chapter four as well as well as tapped through the responses elicited to Q4 of the interview schedule. Five key aspects were investigated, namely: The University research agenda or policy, research and publications, students involvement in research, funding for research, and the University's outreach with the community.

First and foremost the study established the ongoing researches conducted in the science-based faculties studied which included: Supervised postgraduate research as part of training for the award of Masters and PhD degrees, Donor-funded and a few driven Academic Staff Research; and Finance-driven Consultancy Research. According to the NCHE (2006), universities are supposed to be centres of research, excellence, scholarship, knowledge generation and publications. However for this to happen, universities must develop a very robust research philosophy and or agenda. At Gulu University, the study unfortunately established that there is yet no clear research agenda or portfolio in use. 22.37% against 56.58% were the levels of agreement and disagreements recorded from the questionnaire respondents respectively, while responses to Q4 on the interview schedule seeking views of students, lecturers and management all on the same concern unanimously pointed to the fact that research undertakings at the university is still developing and not yet very prominent. In the absence of a research policy, research functions or undertakings become personalized and based on the ingenuity of an individual academics; therefore, policies or structures to handle emerging trends like massification and the entry of market forces in higher education may need to be articulated. Nonetheless, with the launch of the Gulu University journal, various initiatives and interests have emerged from amongst a few Professors and the young academics getting involved in research.

Seemingly to support the foregone, Tikly and Barret (2007) in their paper, *'Educational Quality-Research Priorities and Approaches in the Global Era,'* advance that there is need for critical reflections on structures and processes of programme

management including the empowerment of researchers and research institutions. They further asserted that research and publications functions are one of the most central and integral part of a university's core functions. All over the world, Universities are held in high regards because of a strong research base. On the promotion of lecturers to higher ranks, this research found out that the few promotions got were based more or less on the attainment of higher degrees other than purely as a result of scientific research-based outcomes. When the lecturers' view points on the subject matter were sought, they revealed that their greatest drawbacks in the area of promotion stem from the fact that their involvement in scientific research is lacking. When they were asked to substantiate, they attributed their lack of participation in research to the volume of work created due to the demand on timetable for lectures, tutorials, practical and coursework assessment which, when coupled with the high numbers of students and their thinness on the ground, give them very inadequate time to do research, write papers for publications, as well as concentrate on the internal research projects of their Students. They further revealed that even the few research concepts they have written have drawn little attention by management or have been selectively sponsored. In fact, scanning through the lists of papers and articles published in the Gulu University Journal, 2010, it was easy to confirm that very few of the articles are attributed to the science-based departments studied.

The VCPU (ibid, p 50) pointed with emphasis that one of the primary functions of a university is to create and produce knowledge through research and to

disseminate knowledge through publications (in Peer Reviewed Books and Articles in Scholarly Journals). The second major function of a reputable university is to teach undergraduate and post graduate programmes through research. Thirdly, public universities are expected to set, spearhead and regularly review the national research agenda. It further asserted that a university that does not do research is indistinguishable from a high school and is condemned to intellectual and academic obscurity. Larzillière (cited in Mouton and Waast, 2009: 159) recounting experiences in higher education in Jordan, accentuates that, in Jordan; a faculty member in a university is defined first as an Instructor whose main job is to teach and whose work hours are teaching hours. In spite of that, job promotions in universities are entirely dependent upon research activities and record.

Responses attributed to the lecturers and heads of departments of the science-based faculties at Gulu University agreed that the establishment of the Institute of Research and graduate studies (IR&GS) was a positive move towards strengthening the research portfolio. They further revealed that the IR&GS is putting a great deal of effort to strengthen research and publication capacities in the University. They recounted initiatives like; calling for abstracts of papers for the annual conference, organization of annual conferences and departmental workshops targeting research and publications as some of the milestones being covered in the area which, when used properly, will further their academic pursuit. To emphasize this point, Mohamedbhai (ibid), while addressing himself to research in his paper: “the effects of massification on higher education in Africa”, noted that; research is an important

activity of any university and most of the institutions are making a concerted attempt to keep research active in an environment grossly dominated by teaching. He further recounted that at the University of Ghana, the creation of the Annual Faculty Colloquium which gives teaching staff, post-graduate and final year students an opportunity to present their research results to the scientific community has stimulated research in the faculty and the publication of the proceedings of Faculty Colloquium contributes in some ways to the promotion of publications in the Faculty.

Amidst such a school of thought, it is considered important that Gulu University should study such initiatives in practice in other established and renowned universities and copy what can be applied in their situation towards the improvement of research and publication and especially in how research and innovations can be applied towards the management of massification. Responses owing to the students revealed that their lecturers encourage them to do research and publish within the course of their studies. Their slogan is; “publish or perish”. However, they also expressed disappointment in the way their internal research projects are being supervised. The students in the department of computer science in particular felt that because the number of students is high, the lecturer-student ratio is high resulting into shoddy assessment of their project work. They further observed that the lecturers do more of administrative supervision to have them complete their project work other than the academic one which is more detailed, critical and analytical. They however, contended that they have participated in many researches outside the University at the level of Research Assistants,

Translators/Interpreters or when the university deploys students in the community to conduct some studies.

In a related argument, Belal and Springuel (2006: 10), postulated with respect to Egypt that:

“Gaps in education exists at all undergraduate and postgraduate levels for teaching how to perform research and to write up results. Students are not trained to do research, nor taught how to write scientific papers. This essential part of education is completely neglected in both undergraduate and even postgraduate studies”.

Commenting on foregone paragraph, the study findings however interpolated that at Gulu University research and publications functions is developing on firm grounds; it forms part of the curriculum at both undergraduate and graduate levels, emphasizing innovation and intellectual originality of the staff and students and subject to the assessment of institutional auditors. This totally dispels Belal and Springue (2006) who contend that the research topics for post-graduate students are proposed by supervisors who have instructed the Students and do not encourage the personal student’s thinking...students are used as tools for doing practical or field work but not for research. Thus the notion with respect to Egyptian University graduates that they are capable only of waiting for orders and executing them; no thinking, no arguing, no questioning, no objecting and not even dialoguing does not in any way apply to the

research training at Gulu University science-based faculties so to speak. Turning to members of Corporate Management study results revealed that they are aware that research capacity at the University is low. However, they hastened to add that the biggest challenge experienced in building research, publication and community service capacity is the inadequacy of funding from government. Their revelation was that only about 60% of their budget expectations are funded yearly. This according to them leaves a huge gap which disables satisfactory allocation of funds to priority areas leading to poor performance of set targets. Results of the interviews and focus group discussions on Q4 on the interview schedule also deprecated underfunding as the obstacle hindering development of research capacity in science-based faculties at Gulu University.

Needless to emphasize, the findings corroborate well with Mohamedbhai (ibid) accentuation that a couple of universities have always mentioned lack of funds as a serious constraint in enhancing research agenda at university level. He further revealed that at the University of Ouagadougou, in order to encourage research, a financial incentive is given to each academic staff that can show, in an annual report submitted to management, that s/he has been undertaking research activities during the year. Furthering this discourse, Meek et al. (2009) propounded that research is not only expensive, but often carries many hidden financial burdens for individual higher education Institutions. One of the big debates in many countries is the extent to which Research should be fully funded, covering not only direct costs, but also contributing to

overheads and infrastructure. On a similar note, Sörlin (cited in Meek Lynn and Davis Dianne 2009:49), observed that the funds that go to universities and research institutes, have for a long time stagnated in most countries...so the fact of the matter is that those institutions that carry out the higher education work and do research have to do more and more work for less funding 'per unit', regardless of whether the unit is a student trained for three years or a scientific paper researched, written and published.

Turning to the point on outreach and community service, it was found out that the University is engaged with the community at various levels. The main activities discovered by this study included the following: Promotion of IT skills through training of community leaders, research conducted by senior academics in the community, students from the Faculty of Medicine posted to the health centres for their practice, and students from the Faculty of Agriculture helping farmers in the community in creating new varieties of crops. According to NCHE (ibid), modern Universities are supposed to be leaders in the social and economic development of their communities and nations. In the words of Harkavy (2000); "To make the case for university-community partnership is easy to do. The hard thing is to figure out how to do it. The hardest thing of all, of course, is to actually get it done." In this regard Gulu University has lived to the expectations of its motto: "For community transformation." The hardest thing they have experienced is that their community engagements have not been able to comb the community to their expectations because of inadequacy of funding from government and other collaborative partners.

AUCEA (ibid) expounds that community engagement is a specific method for academic research and teaching that necessarily involves external communities; business, industry, schools, governments, non-governmental organisations, associations, indigenous and ethnic communities, and the general public in collaborative activities that address community needs and opportunities while also enriching the teaching, learning and research objectives of the University. It further explains that community engagement is a form of academic endeavour where external sources of expertise and wisdom are seen as essential to advancing knowledge and understanding. It is not a separate or distinct activity within a university but is a shared enterprise between universities and their community partners that involves an exchange of knowledge and expertise that produces mutual benefit. It further propounded that universities benefit from effective engagement with their communities for instance; student learning outcomes are enhanced through learning experiences and make knowledge relevant to community issues and priorities.

To the Australian Universities, engagements are believed to broaden the concept of knowledge transfer to reveal that knowledge generation has many possible applications of value to society in addition to commercialisation. They therefore consider engagement as a core activity of a university's research and teaching agenda, and should not be considered a separate undertaking. University engagement is a scholarly activity and it recognises the community as knowledge-rich partner, where; the university's research capacity becomes more accessible as a resource to address community problems or aspirations. Communities gain a wide range of benefits through their

productive interactions with Universities. In this way, communities are recognised for their intellectual assets and empowered to contribute to knowledge generation that directly increases community capacity for action and problem-solving. Engagement makes the knowledge resources of Universities accessible to Communities in ways that can benefit social, economic, environmental and cultural capacity and conditions. It summarizes that community engagements should be a key component in a University's Staff recruitment, induction, promotion, and performance review policies.

While agreeing with the above postulations, it is fundamental to note that university-community alliance whose success heavily relies on good planning and funding can experience great difficulties in a cash-trap university like Gulu. A concerted effort to remedy this shortfall would be the introduction of learning-research camps or demonstration units within the university from where the university experts can demonstrate their skills to motivated community members, other than for the university personnel to traverse the country sides. This training of trainers approach will help to reduce cost to certain extents and also perfect supervision of the research camps. This approach will further enlighten the community and put them into a better perspective to interact with their environment at a more beneficial level.

Research question Five

What is the influence of quality institutional financial management on the management of massification in science-based faculties at Gulu University? This

research question was answered by addressing three key questions: The University's budget process, the University's funding strategy and University's annual management of the budget.

In the first instance, there were mixed reactions from the different cadres of respondents on the budget process at Gulu University. The students claimed non-participation, while the lecturers admitted involvement, but discredited the process because of non implementation of the budget to prioritize improvement of teaching, learning, assessment and research. Dinca (2002), while speaking of financial management in universities in the United States (US), propounded that there are three fundamental aspects that should take centre stage, namely: Efficient use of budgeted funds, capacity of universities to generate their own incomes and ability to design a clear and realistic perspectives of the development for a university strategic plan. In Uganda, public universities have three key sources of funding: Government subventions, grants and students' fees and other internally generated funds; Appropriation in Aid (AIA). In the guideline from the National Council for Higher Education [NCHE] (2011), which is the regulatory authority for Ugandan universities, the areas which are critical to consider in Institutional Financial Management include: the budgeting process, sources of funding, percentage distribution of the budget to priority areas, and the aspect of accountability.

Responses of the Heads of Departments in the science-based faculties revealed that whereas the Heads of Departments get fully involved in the budget process, the

implementation of the budget is normally centralized and rarely seeks their inputs. One head of department castigated that they are merely a conduit for financial inflows to the extent that those areas they prioritize in their budgeting are always not given the attention they deserve during the implementation stages. This comment agrees in part with Parmley et al (2009) avowal while expounding on higher education budgeting practices in the United States which revealed that in the US, the budget processes are diverse, complex, and dynamic and although states may share similarities, there is no standard budgeting practice. Turning to the Corporate Managers, the study findings revealed that standard practices guide the realization of the budget. It was however observed that in many instances, challenges are met especially in mobilizing the University's units to participate in the budget process. In Uganda, the Budget Act (2001, 4 (5) 1, 2) stipulates that;

“(1). The Head of Government Department, Self Accounting Department, Institution, Organisation or Commission shall submit to the President preliminary estimates of revenue and expenditure of that department, Institution, Organization or Commission for the following financial year, by the 15th of February in each year. (2). Estimates prepared and submitted under subsection (1) shall be laid before Parliament by the President under sections ..., but estimates by bodies established under the constitution shall be laid without amendments however they may have recommendations made by Government.”

Drawing from experience of many years in higher education management and

administration, the researcher avers that university budgeting, starts at the user department level. This is then forwarded to the Management level where they are reviewed and synchronised before it is presented to the University Council for approval and thereafter to the sector Ministry's budget for approval at the country's Parliament. However, the study findings deprecate that the inadequacy of budgetary funding by government to universities and especially to Gulu University, has challenged capacity building in the science-based faculties in the face of rising massification against stagnant improvement of the educational facilities and resources. Eurydice (2008) recounts that in Greece; the budgeting process focuses five headings: staff, operational expenses, student catering, temporary staff and public investments.

In Bulgaria there are also five headings: study costs; research; scholarships; costs for publishing textbooks, research results, etc.; and costs for capital investment. In Latvia on the other hand, higher education Institutions are required to request permission from the *state treasury* to make transfers between amounts established for salaries, expenditure on immovable and other common costs. In France, institutions must submit the budget proposal to the supervisory authority before implementing it. In certain cases, the budget may be submitted for approval or refused by the authorities (for example, in the case of non-compliance with the budget balance or allocation of public funding). In Hungary, institutions have to send an annual draft budget proposal to the maintainers prior to any spending. These postulations compare favourably with the experience practice at Gulu university. However, what remains derivative is the challenge met by the departments in championing the core functions of their vision and mission statements; Knowledge generation, research and

community service, which remain seriously constraint by irregular and inadequate funding of the budget by government to the extent that a lot of cuts are to be applied in many areas, thus affecting the core needs of the departments.

Cooke and Slack (1991) postulation that taking part in decision-making builds a sense of ownership and consequent determination to put the decision into effect, brings to bare the merits of the foregone statement. Decisions imposed on people from outside do not create this ownership so to speak. Finally, Isoke (1997) cited by Seettumba (Ibid) argued that involvement in decision-making encourages employees to trust the organization more and the decisions made. He further contended that this often reduces resistance to change and contribute to more enthusiastic programmes' implementation. Conflicts have been seen to decline in conditions of collaborative decision-making, thereby promoting effective problem solving and enhanced job satisfaction. In spite of the strength in the foregone argument, what however, needs to be done, in order to improve the efficient and effective management of the institution's finances in the short, medium and long term hinges so much on the effective decentralization of management and the implementation of corporate governance strategy! The departments must be made functionally viable and self-accounting and guided by the principles of procedural efficiency, transparency and accountability, and supported to improve in their planning at both the collegial and structural levels and remain responsive to both formative and summative evaluation from the centre for the purpose of improved service delivery and especially to marshal the complexities of massification.

Conclusions

Based on the findings of this study and the subsequent discussions, the following conclusions were reached:

Massification though a recent phenomenon, is a real and complex subject in higher education today and more especially at university education to which keen attention must be focused.

The power of Institutional Autonomy and Governance enshrined in the UOTIA which constitute the hallmark and foundation of management at university level is not yet being adequately utilized at Gulu University to cause management and administrative interventions to mitigate the ills of massification.

At Gulu University the operationalization of NCHE quality benchmarks are not popular in use in the academic as well as the administrative units thereby affecting management and implementation of the university's core functions; teaching, research and community service.

Gulu University has few top-notch Professors and highly trained academics with Masters and PhDs. These as a result have affected the capacity of knowledge generation, research, and community outreach as well as the entire knowledge dissemination platform through publications. The absence of a comprehensive

research agenda or portfolio to guide research, publications and community alliances undertakings has also compromised the quality and procedural efficiencies of these core functions in the University.

Government funding at Gulu University is inadequate. Coupled with this, there is also inadequate institutional financial management, transparency and accountability.

Recommendations

In light of the findings, the following recommendations are made in an attempt to address the challenges of massification in Science-based Faculties at Gulu University for the overall purpose of preserving quality enhancement of education:

Public Universities in Uganda and more especially Gulu University must quickly come to a realization that massification in Higher education is real and is taking an irreversible trend in this country. University Management must therefore not increase enrolment without commensurate improvement in the educational resources, facilities and infrastructure.

Gulu University must continuously implement the NCHE quality benchmarks to enable them address salient recommendations which steer quality management and sustainability in pedagogy, andragogy and synagogy. Gulu University must develop viable IT capabilities in all the units so that management becomes more flexible, efficient and effective. It should also plan towards promoting the virtual learning environment by use of such learning frameworks like the modules or other IT

platforms. This will enable the university to maintain the numbers and still afford a teaching-learning environment which is conducive.

Gulu University Management should embark on recruiting high caliber Academics with Masters and PhDs and train them with skills in pedagogy, andragogy and synagogy and more especially with the skills of handling large numbers of students in a teaching-learning situation and at the same time work towards improving the teaching-learning facilities. In the same vein, the University should equip the academics with the required tools for research and inject more funding towards that direction.

Gulu University should encourage the Corporate Governance approach in all its Management and Administrative units with a view of promoting bottom-up planning so that stakeholders' participation take centre stage at each planning levels for the realization of anticipated unit objectives and the promotion of required procedural efficiency in order to yield desired outputs and targeted outcomes.

Gulu University should adopt a more participatory financial management approaches so that at the planning hub, more stakeholders get involved for better realization of unit objectives. The operations of the financial department should gradually shift from manual based operations to a more advanced computer based systems. This will improve efficiency and effectiveness as well as enhanced better accountability and transparency for the overall attainment of the Universities' core functions.

Suggested areas for further research

Having studied massification and its management in the science-based faculties at Gulu University, it is hereby contended that massification is a recent phenomenon in higher education whose perception and perspectives should be well comprehended and understood to surmount its drawbacks. Further research therefore, needs to be done in other institutions of higher learning, both public and private, to determine how the challenges posed by massification can be turned into an opportunity for a developing nation like Uganda without laying waste.

Furthermore, massification should be studied from the perspective of Corporate Management especially with regards to infrastructural planning, educational resource allocation and funding.

Replication is also necessary, not only for the case of repetition or counter-checking the findings of this study, but also as a means or an opportunity towards bringing to perspective the regulatory vigilance of the NCHE in all institutions of higher learning so that improvement in the management of massification of education at University level and indeed in the overall realm of higher education is realized.

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APPENDICES

APPENDIX 1:

QUESTIONNAIRE FOR STUDENTS

Dear Respondent,

This questionnaire is for a study being conducted at Gulu University for a PhD. Specifically the study is intended to find out the quality of management of massification (rapid expansion and development) in the science-based faculties at Gulu University. The information required from you is meant for academic purposes only and will be treated with utmost confidentiality. The questionnaire and interview guides are based on the National Council for Higher Education Quality Assurance framework for Uganda Universities 2006. Please kindly respond to all items in the instruments.

BACKGROUND INFORMATION (Tick where appropriate)

1. Gender:

- Male ()
- Female ()

2. Faculty:

- Medicine ()
- Agriculture ()
- Science ()

3. Programme:

- MBchB ()
- Bio-System Engineering ()
- Information Technology ()

4. Year of Study:

- One ()
- Two ()

5. Semester of study:

- One ()
- Two ()

6. Score at 'A' level:

- 4 principal passes ()
- 3 principals passes ()

- 2 principals passes ()
- Others (specify).....

7. Year of Admission

QUALITY OF INSTITUTIONAL AUTONOMY AND GOVERNANCE

(Tick where applicable)

1. Council and Senate are properly instituted organs in Gulu University.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

2. The students' guild is a properly instituted organ in Gulu University.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

3. The students are represented on Gulu University Senate & Council.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

4. Gulu University Council respects and encourages students' views in Council.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

5. Gulu University Council implements students' academic/welfare concerns promptly.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

6. Gulu University Senate respects and encourages students' views in Senate.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

7. Gulu University Senate implements students' academic/welfare concerns promptly.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

8. The mandate (vision and mission) of Gulu University are clear.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

9. The mandate (vision and mission) cater for students academic welfare.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

10. The strategic plan of Gulu University embraces students' academic needs adequately.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

11. Students in the University are recruited according to the guidelines set by NCHE.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

12. Students in the University are disciplined according to guidelines prescribed in the ACT.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

QUALITY OF TEACHING, LEARNING AND EVALUATION

1. Students and lecturers of your department report to the University promptly at the start of the Semester.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

2. Teaching and Learning start promptly every semester.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

3. My departments have the Uganda NCHE (National Council for Higher Education) quality standards/check lists to guide teaching and learning.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

4. Lecturers avail students with course outlines in my department.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

5. How many students are enrolled in your department?

Below 50 () 50-100 () 101-200 ()

201-300 ()

Above 301 ()

6. What is the percentage of students sponsored by government in your department?

Below 20% () 20-40% () 40-60% ()

60-80% ()

7. Comment on the class enrolment over the years?

High **(45 above)** () Satisfactory **(35-45)** ()

Moderate **(25-35)** () Low **(15-25)** ()

8. This enrolment, given the level of teaching/learning facilities is low?

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

9. Comment on Lecturers' commitment to their work.

Very committed () Committed ()

Uncommitted () Carefree ()

Undecided ()

10. The syllabus coverage in all my course units is appropriate.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

11. What assessment methods do your lecturers employ to evaluate you?

- 1 Course work and end of semester exams only ()
- 2 Course works, 2 unit test and end of semester exams ()
- 1 unit test and end of semester exams only ()
- End of semester exams only ()

12. Assessment feedbacks are provided timely by the Lecturers.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

13. The department organizes practical work for the learners as stipulated in the course outline.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

14. Attendance records for Lecturers and Students are available?

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

15. Complaints are recorded by students on Lecturers?

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

16. Students' records show that the Lecturers are committed in their work.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

17. Complaints are recorded from Lecturers on Students?

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

18. Lecturers complain that students are not very committed in their work.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

19. There are complaints from the Dean of Faculty on the teaching-learning process?

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

20. The Dean complains that the teaching and learning process in the department is poor.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

21. Students get involve in evaluating their Lecturers?

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

22. Does the Head of Department carry-out regular observations of lectures?

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

23. The Lecturers:

i. Clearly explain the objectives of the Course and have good sense of

Instructions:

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

ii. Have very good grasp of the Subject matter:

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

iii. Are familiar with inquiry methods of instruction:

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

iv. Are sensitive to individual differences and encourage personal opinion:

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

v. Provide immediate and meaningful feedback to students' efforts:

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

vi. Are effective and efficient instructors:

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

vii. Complete assigned task in time (Course Units):

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

viii. Use all the available time assigned on the time table correctly:

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

ix. Freely discuss with students during lectures:

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

x. Mark students' course work and test in time:

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

xi. Organize tutorial Classes:

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

xii. Are happy with class enrolment:

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

SUFFICIENCY AND QUALITY OF EDUCATIONAL FACILITIES

1. Comment on State of Educational Facilities:

Adequate = Readily Available;

Satisfactory = **Can be accessed;**

Inadequate = Difficult to access.

Adequate Satisfactory Inadequate

i. Library Reading Space.....

ii. Library Text.....

iii. Library Chairs.....

iv. Classroom Space

v. Classroom Chairs

vi. Laboratory Space

vii. Laboratory Chemicals.....

viii. Laboratory Equipments

COMMENT ON REQUIRED RATIOS AS (Ideal; Good; Acceptable; Can be improved; Unacceptable)

	Ideal	Good	Acceptable	Can be improved	Unacceptable
i). Ratio of relevant text to students:	1:5	1:10	1:20	1:30	1:40
ii). Laboratory equipment to Students' ratio:	1:1	1:2	1:4	1:5	1:8
iii). Computers to Students ratio:	1:1	1:5	1:10	1:20	1:25
iv). Access to internet per Student hour:	1:3	1:5	1:10	1:20	None

QUALITY OF RESEARCH AND PUBLICATIONS

1. The University has a clear research agenda/portfolio that students are aware of.

Strongly agree Agree Undecided Disagree Strongly dis-agree
 () () () () ()

2. Lecturers are promoted because they do research and publish.

Strongly agree Agree Undecided Disagree Strongly dis-agree
 () () () () ()

3. Lecturers present papers in seminars.

Strongly agree Agree Undecided Disagree Strongly dis-agree
 () () () () ()

4. Lecturers encourage student to do research.

Strongly agree Agree Undecided Disagree Strongly dis-agree
 () () () () ()

5. Lecturers have published many academic papers.

Strongly agree Agree Undecided Disagree Strongly dis-agree
 () () () () ()

6. There are articles from my department that have been published in local and international journals.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

7. Students are involved in a number of research projects won in the department.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

8. There are books with ISBN/ISSN published by staff in my department.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

9. Some percentage of our departmental budget is allocated to research and publications.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

10. Some percentage of the departmental budget is allocated to students for research and publications.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

QUALITY OF INSTITUTIONAL FINANCIAL MANAGEMENT

1. Students get involved in the departmental budget process.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

2. My department funds our course needs/requirements fully.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

3. From where does your department get most of its funding?

Government () Students Fees ()

Endowments () Donors, Friends, Development partners ()

Not sure ()

4. In which area do you think your department prioritizes its funding?

Teaching and learning facilities ()

Academic staff development/staff salary ()

Research and Publications ()

Infrastructure development ()

Not sure ()

5. The budgetary expectation of our department is met annually.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

THE UNIVERSITY AND THE COMMUNITY

1. Your department runs programs and projects that focus on the community.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

2. Your department engages the students into a number of apprentices and outreaches.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

3. Community response to the university's programmes is positive.

Strongly agree Agree Undecided Disagree Strongly dis -agree

() () () () ()

4. Your department has developed a number of partnerships and collaborations.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

THANK YOU FOR PARTICIPATION IN THIS RESEARCH UNDERTAKING

APPENDIX 2:
QUESTIONNAIRE FOR LECTURERS

Dear Respondent,

This questionnaire is for a study being conducted at Gulu University for a PhD.

Specifically the study is intended to find out the quality of management of massification (rapid expansion and development) in the science-based faculties at Gulu University. The information required from you is meant for academic purposes only and will be treated with utmost confidentiality. The questionnaire and interview guides are based on the National Council for Higher Education Quality Assurance framework for Uganda Universities 2006. Please kindly respond to all items in the instruments.

BACKGROUND INFORMATION (Tick where applicable)

1. Gender:

- Male ()
- Female ()

2. Academic Qualifications:

- Bachelor's degree ()
- Master's degree ()
- PhD ()
- Post Doctoral degree ()
- Others (Specify).....

3. Professional Rank:

- Teaching Assistant ()
- Lecturer ()
- Senior Lecturer ()
- Associate professor ()
- Professor ()

4. Department:

- Human Anatomy ()
- Bio-system Engineering ()
- Computer Science ()

5. Number of years as lecturer in Gulu University:

- 1-2 years ()
- 3-5 years ()
- 5 years above ()

QUALITY OF INSTITUTIONAL AUTONOMY AND GOVERNANCE

(Tick where applicable)

- | | | | | | |
|--|------------------------------|---------------------|-------------------------|------------------------|----------------------------------|
| 1. Council and Senate are properly instituted organs in Gulu University. | Strongly agree
() | Agree
() | Undecided
() | Disagree
() | Strongly dis-agree
() |
| 2. The staff's union is a properly instituted organ in Gulu University. | Strongly agree
() | Agree
() | Undecided
() | Disagree
() | Strongly dis-agree
() |
| 3. The staff is represented on Gulu University Senate & Council. | Strongly agree
() | Agree
() | Undecided
() | Disagree
() | Strongly dis-agree
() |
| 4. Gulu University Council respects and encourages staff's views in Council. | Strongly agree
() | Agree
() | Undecided
() | Disagree
() | Strongly dis-agree
() |
| 5. Gulu University Council implements staff's welfare concerns promptly. | Strongly agree
() | Agree
() | Undecided
() | Disagree
() | Strongly dis-agree
() |
| 6. Gulu University Senate respects and encourages staff's views in Senate. | Strongly agree
() | Agree
() | Undecided
() | Disagree
() | Strongly dis-agree
() |
| 7. Gulu University Senate implements staff's related concerns promptly. | Strongly agree
() | Agree
() | Undecided
() | Disagree
() | Strongly dis-agree
() |
| 8. The mandate (vision and mission) of Gulu University are clear. | Strongly agree
() | Agree
() | Undecided
() | Disagree
() | Strongly dis-agree
() |
| 9. The mandate (vision and mission) cater for staff's academic welfare. | Strongly agree
() | Agree
() | Undecided
() | Disagree
() | Strongly dis-agree
() |
| 10. The strategic plan of Gulu University embraces staff needs adequately. | Strongly agree
() | Agree
() | Undecided
() | Disagree
() | Strongly dis-agree
() |

11. Staff in the University are recruited according to the guidelines set by NCHE.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

12. Staff in the University are disciplined according to guidelines prescribed in the ACT.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

QUALITY OF TEACHING, LEARNING AND EVALUATION

1. Students and lecturers of your department report to the University promptly At the start of the Semester.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

2. Teaching and Learning start promptly every semester.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

3. My departments have the Uganda NCHE (National Council for Higher Education) quality standards/check lists to guide teaching and learning.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

4. Lecturers avail students with course outlines in my departments.

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

5. How many students are enrolled in your department?

Below 50 () 50-100 () 101-200 ()

201-300 ()

Above 301 ()

6. What is the percentage of students sponsored by government in your department?

Below 20% () 20-40% () 40-60% ()

60-80% ()

7. Comment on the class enrolment over the years?

High **(45 above)** () Satisfactory **(35-45)** ()

Moderate **(25-35)** () Low **(15-25)** ()

8. This enrolment, given the level of teaching/learning facilities is low?

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

9. Comment on Lecturers' commitment to their work.

Very committed () Committed ()
 Uncommitted () Carefree () Undecided ()

10. The syllabus coverage in all my course units is appropriate.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

11. What assessment criteria do you employ to evaluate your students during the semester?

- 1 Course work and end of semester exams only ()
- 2 Course works, 2 unit test and end of semester exams ()
- 1 unit test and end of semester exams only ()
- End of semester exams only ()

12. Assessment feedbacks are sent timely to the students.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

13. The department organizes practical work for the learners as stipulated in the course outline.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

14. Attendance records for Lecturers and Students are available?

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

15. Complaints are recorded by students on Lecturers?

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

16. Students' records show that the Lecturers are committed in their work.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

17. Complaints are recorded from Lecturers on Students?

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

18. Lecturers complain that students are not very committed in their work.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

19. There are complaints from the Dean of Faculty on the teaching-learning process?

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

20. The Dean complains that the teaching and learning process in the department is poor.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

21. Students get involve in evaluating their Lecturers?

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

22. Does the Head of Department carry-out regular observations of lectures?

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

23. The Lecturers:

- i. Clearly explain the objectives of the Course and have good sense of Instructions:

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

- ii. Have very good grasp of the Subject matter:

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

- iii. Are familiar with inquiry methods of instruction:

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

- iv. Are sensitive to individual differences and encourage personal opinion:

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

- v. Provide immediate and meaningful feedback to students' efforts:

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

- vi. Are effective and efficient instructors:

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

- vii. Complete assigned task in time (Course Units):

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

- viii. Use all the available time assigned on the time table correctly:

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

- ix. Freely discuss with students during lectures:

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**

() () () () ()

x. Mark students' course work and test in time:

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

xi. Organize tutorial Classes:

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

xii. Are happy with class enrolment:

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

SUFFICIENCY AND QUALITY OF EDUCATIONAL FACILITIES

1. Comment on State of Educational Facilities:

Adequate	=	Readily Available;
Satisfactory	=	Can be accessed;
Inadequate	=	Difficult to access.

	Adequate	Satisfactory	Inadequate
i. Library Reading Space.....			
ii. Library Text			
iii. Library Chairs			
iv. Classroom Space.....			
v. Classroom Chairs.....			
vi. Laboratory Space			
vii. Laboratory Chemicals.....			
viii. Laboratory Equipments			

COMMENT ON REQUIRED RATIOS AS (Ideal; Good; Acceptable; Can be improved; Unacceptable)

		Ideal	Good	Accept - able	Can be improve	Unaccept able
i.	Ratio of relevant Text to students	1:5	1:10	1:20	1:30	1:40
ii.	Laboratory equipment to Students' ratio	1:1	1:2	1:4	1:5	1:8
iii.	computers to Students ratio	1:1	1:5	1:10	1:20	1:25
iv.	Access to internet per Student hour	1:3	1:5	1:10	1:20	None

QUALITY OF RESEARCH AND PUBLICATIONS

1. The University has a clear research agenda/portfolio that students are aware of.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
() () () () ()

2. Lecturers are promoted largely because they do research and publish.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
() () () () ()

3. Lecturers present papers in seminars.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
() () () () ()

4. Lecturers encourage student to do research.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
() () () () ()

5. Lecturers have published many academic papers.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
() () () () ()

6. There are articles from my department that have been published in local and international journals.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
() () () () ()

7. Students are involved in a number of research projects won in the department.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

8. There are books with ISBN/ISSN published by staff in my department.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

9. Some percentage of our departmental budget is allocated to research and publications.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

10. Some percentage of the departmental budget is allocated to staff for research and publications.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

INSTITUTIONAL FINANCIAL MANAGEMENT

1. Lecturers get involved in the departmental budget process.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

2. My department funds my course needs/requirements fully.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

3. From where does your department get most of its funding?

Government () Students Fees ()
 Endowments ()
 Donors, Friends, Development partners ()
 Not sure ()

4. In which area do you think your department prioritizes its funding?

Teaching and learning facilities ()
 Academic staff development/staff salary ()
 Research and Publications ()
 Infrastructure development ()
 Not sure ()

5. The budgetary expectation of my department is met annually.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

THE UNIVERSITY AND THE COMMUNITY

1. Your department runs programmes and projects that focus on the community.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()

2. Your department engages the students into a number of apprentices and outreaches.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()

3. Community response to the university's programmes is positive.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	() ()		()

4. Your department has developed a number of partnerships and collaborations.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	() ()		()

THANK YOU FOR PARTICIPATION IN THIS RESEARCH UNDERTAKING

APPENDIX 3
QUESTIONNAIRE FOR HEADS OF DEPARTMENT

Dear Respondent,

This questionnaire is for a study being conducted at Gulu University for a PhD. Specifically the study is intended to find out the quality of management of massification (rapid expansion and development) in the science-based faculties at Gulu University. The information required from you is meant for academic purposes only and will be treated with utmost confidentiality. The questionnaire and interview guides are based on the National Council for Higher Education Quality Assurance framework for Uganda Universities 2006. Please kindly respond to all items in the instruments.

BACKGROUND INFORMATION(Tick where appropriate)

1. Gender
Male ☐ Female ☐
2. Professional Rank:
Lecturer ☐ Senior Lecturer ☐
Associate professor ☐
Professor ☐
3. Academic Qualification:
Bachelor's Degree ☐ Master Degree ☐
PhD ☐
Others (Specify).....
4. Department:
Human Anatomy ☐ Bio-systems Eng. ☐
Computer Science ☐
5. How many Years spent in Gulu University
1-3 years ☐ 3-5 year ☐
5 years above ☐
6. For how long have you served as a Head of Department in Gulu University?
1-2 years ☐ 2-3 years ☐
3-5 years ☐

7. What is the highest professionally ranked staff in your department?
 Lecturer () Senior Lecturer ()
 Associate professor ()
 Professor ()
8. What is the highest Academically Ranked Staff in your department?
 Post Doctoral () PhD () Master Degree ()
 Bachelor's Degree ()
9. All establishments in the department are filled.
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

QUALITY OF INSTITUTIONAL AUTONOMY AND GOVERNANCE (Tick where applicable)

1. Council and Senate are properly instituted organs in Gulu University.
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
2. The staff union and students' guild are properly instituted organs in Gulu University.
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
3. The staff and students are represented on Gulu University Senate & Council.
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
4. Gulu University Council respects and encourages staff and students' views in Council.
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
5. Gulu University Council implements staff and students' welfare concerns promptly.
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
6. Gulu University Senate respects and encourages staff and students' views in Senate.
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
7. Gulu University Senate implements staff and students related concerns promptly.
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
8. The mandate (vision and mission) of Gulu University are clear.
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

9. The mandate (vision and mission) cater for departmental needs as expected.
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
10. The strategic plan of Gulu University embraces departmental plans appropriately.
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
11. Staff in the University are recruited according to the guidelines set by NCHE.
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
12. Staff in the University are disciplined according to guidelines prescribed in the ACT.
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

QUALITY OF TEACHING, LEARNING AND EVALUATION

1. Students and lecturers of your department report to the University promptly at the start of the Semester.
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
2. Teaching and Learning start promptly every semester.
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
3. My departments have the Uganda NCHE (National Council for Higher Education) quality standards/check lists to guide teaching and learning.
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
4. Lecturers avail students with course outlines in my departments.
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
5. How many students are enrolled in your department?
 Below 50 () 50-100 () 101-200 ()
 201-300 ()
 Above 301 ()
6. What is the percentage of students sponsored by government in your department?
 Below 20% () 20-40% () 40-60% ()
 60-80% ()
7. Comment on the average class enrolment over the years?
 High (**45 above**) () Satisfactory (**35-45**) ()
 Moderate (**25-35**) () Low (**15-25**) ()
8. This enrolment, given the level of teaching/learning facilities in the

department is low.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

9. Comment on Lecturers' commitment to their work.

Very committed () Committed ()
 Uncommitted ()
 Carefree () Undecided ()

10. The syllabus coverage in all course units in the department is appropriate.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

11. What assessment criteria do Lecturers employ to evaluate students in the department in a semester?

- 1 Course work and end of semester exams only ()
- 2 Course works, 2 unit test and end of semester exams only ()
- 1 unit test and end of semester exams only ()
- End of semester exams only ()

12. Assessment feedbacks are sent timely to the students.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

13. The department organizes practical work for the learners as stipulated in the course outline.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

14. Attendance records for Lecturers and Students are available?

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

15. Complaints are recorded by students on Lecturers?

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

16. Students' records show that the Lecturers are committed in their work.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

17. Complaints are recorded from Lecturers on Students?

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

18. Lecturers complain that students are not very committed in their work.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

19. There are complaints from the Dean of Faculty on the teaching-learning process?

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

20. The Dean complains that the teaching and learning process in the department is poor.
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
21. Students get involve in evaluating their Lecturers?
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
22. The Head of Department carry-out regular observations of lectures?
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
23. The Lecturers:
- i. Clearly explain the objectives of the Course and have good sense of Instructions:
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
 - ii. Have very good grasp of the Subject matter:
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
 - iii. Are familiar with inquiry methods of instruction:
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
 - iv. Are sensitive to individual differences and encourage personal opinion:
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
 - v. Provide immediate and meaningful feedback to students' efforts:
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
 - vi. Are effective and efficient instructors:
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
 - vii. Complete assigned task in time (Course Units):
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
 - viii. Use all the available time assigned on the time table correctly:
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
 - ix. Freely discuss with students during lectures:
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
 - x. Mark students' course work and test in time:
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()
 - xi. Organize tutorial Classes:
Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

xii. Are happy with class enrolment:

Strongly agree Agree Undecided Disagree Strongly dis-agree
() () () () ()

SUFFICIENCY AND QUALITY OF EDUCATIONAL FACILITIES

1. Comment on State of Educational Facilities:

Adequate	=	Readily Available;
Satisfactory	=	Can be accessed;
Inadequate	=	Difficult to access.

	Adequate	Satisfactory	Inadequate
i. Library Reading Space.....			
ii. Library Text			
iii. Library Chairs			
iv. Classroom Space			
v. Classroom Chairs			
vi. Laboratory Space			
vii. Laboratory Chemicals			
viii. Laboratory Equipments			

COMMENT ON REQUIRED RATIOS AS (Ideal; Good; Acceptable; Can be improved; Un-acceptable)

	Ideal	Good	Accept - able	Can be improved	Unaccept-able
i. Ratio of relevant Text to students	1:5	1:10	1:20	1:30	1:40
ii. Laboratory equipment to Students' ratio	1:1	1:2	1:4	1:5	1:8
iii. computers to Students ratio	1:1	1:5	1:10	1:20	1:25
iv. Access to internet per Student hour	1:3	1:5	1:10	1:20	None

QUALITY OF RESEARCH AND PUBLICATIONS

1. The University has a clear research agenda/portfolio that students are aware of.

Strongly agree Agree Undecided Disagree Strongly dis-agree
() () () () ()

2. Lecturers in the department are promoted largely because they do research and publish.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

3. Lecturers in the department present papers in seminars.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

4. Lecturers in the department encourage student to do research.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

5. Lecturers in the department have published many academic papers.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

6. There are articles from the department that have been published in local and international journals.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

7. Students are involved in a number of research projects won in the department.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

8. There are books with ISBN/ISSN published by staff in the department.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

9. Some percentage of our departmental budget is allocated to research and publications.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

10. Some percentage of the departmental budget is allocated to staff and students for research and publications.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

INSTITUTIONAL FINANCIAL MANAGEMENT

1. Lecturers get involved in the departmental budget process.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

2. The department funds course needs/requirements fully.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

3. From where does your department get most of its funding?

Government	()	Students Fees	()
Endowments	()	Donors, Friends, Development partners	()
Not sure	()		

4. In which area do you think your department prioritizes its funding?

Teaching and learning facilities	()
Academic staff development/staff salary	()
Research and Publications	()
Infrastructure development	()
Not sure	()

5. The budgetary expectation of my department is met annually.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()

THE UNIVERSITY AND THE COMMUNITY

1. The department runs programmes and projects that focus on the community.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()

2. The department engages the students into a number of apprentices and outreaches.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()

3. Community response to departmental programmes is positive.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()

3. The department has developed a number of partnerships and collaborations.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()

THANK YOU FOR PARTICIPATION IN THIS RESEARCH UNDERTAKING

APPENDIX 4

QUESTIONNAIRE FOR CORPORATE MANAGERS

Dear Respondent,

This questionnaire is for a study being conducted at Gulu University for a PhD. Specifically the study is intended to find out the quality of management of massification (rapid expansion and development) in the science-based faculties at Gulu University. The information required from you is meant for academic purposes only and will be treated with utmost confidentiality. The questionnaire and interview guides are based on the National Council for Higher Education Quality Assurance framework for Uganda Universities 2006. Please kindly respond to all items in the instruments.

BACKGROUND INFORMATION (Tick where in the empty brackets and answer as appropriate)

Title.....

1. Gender

- Male ()
- Female ()

2. Academic Qualification (degree):

- Bachelor's Degree ()
- Master ()
- PhD ()
- Others

.....

3. Number of years spent in Gulu University

- 1-2 years ()
- 3-5 years ()
- 5 years and above ()
- Others (Specify).....

4. Professional Rank:

- Lecturer ()
- Senior Lecturer ()
- Associate professor ()

- Professor ()
- Others (Specify).....

QUALITY OF INSTITUTIONAL AUTONOMY AND GOVERNANCE (Tick where applicable)

1. Council and Senate are properly instituted organs in Gulu University.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()
2. The staff union and students' guild are properly instituted organs in Gulu University.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()
3. The staff and students are represented on Gulu University Senate & Council.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()
4. Gulu University Council respects and encourages staff and students' views in Council.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()
5. Gulu University Council implements staff and students' welfare concerns promptly.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()
6. Gulu University Senate respects and encourages staff and students' views in Senate.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()
7. Gulu University Senate implements staff and students related concerns promptly.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()
8. The mandate (vision and mission) of Gulu University are clear.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()
9. The mandate (vision and mission) cater for all the key areas in the University.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()

10. The strategic plan of the University caters for all university's plans appropriately.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

11. Staff in the University are recruited according to the guidelines set by NCHE.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

12. Staff in the University are disciplined according to guidelines prescribed in the ACT.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

QUALITY OF TEACHING, LEARNING AND EVALUATION

1. Students and lecturers report to the University promptly at the start of the Semester.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

2. Teaching and Learning start promptly every semester.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

3. The University follows the Uganda NCHE (National Council for Higher Education) quality standards/check lists to guide teaching and learning.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

4. Management reports indicate that Lecturers avail students with course outlines in their departments.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

5. Comment on students' enrollment versus the education resources in the University?

High () Satisfactory () Moderate () Low ()

6. What is the percentage of students sponsored by government in the University?

Below 20% () 20-40% () 40-60% ()

60-80% ()

7. Comment on the average class enrolment over the years?

High **(45 above)** () Satisfactory **(35-45)** ()
 Moderate **(25-35)** () Low **(15-25)** ()

8. This enrolment, given the level of teaching/learning facilities in the departments is low.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()

9. Comment on Lecturers' commitment to their work.

Very committed	()	Committed	()
Uncommitted	()		
Carefree	()	Undecided	()

10. Reports on syllabus coverage in all programmes are satisfactory.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()

11. What assessment criteria do Lecturers employ to evaluate students in their departments within a semester?

- 1 Course work and end of semester exams only ()
- 2 Course works, 2 unit test and end of semester exams only ()
- 1 unit test and end of semester exams only ()
- End of semester exams only ()
- Information not available to me ()

12. Management reports indicate that assessment feedbacks are sent timely to the students.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()

13. Management reports indicate that the departments organize practical work for the learners as stipulated in the course outline.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()

13. Management reports indicate that attendance records for Lecturers and Students are available?

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()

15. Management reports indicate that complaints are recorded by students on Lecturers?

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()

16. Management reports indicate that students complain that the Lecturers are not committed in their work.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()

17. Management reports indicate that complaints are recorded from Lecturers on Students?

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

18. Management reports indicate that Lecturers complain that students are not committed in their work.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

19. Management reports indicate that there are complaints from the Deans of Faculties on the teaching-learning process?

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

20. Management reports indicate that Deans complain that the teaching and learning process in the departments is poor.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

21. Management reports indicate that students get involve in evaluating their Lecturers?

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

22. Management reports indicate that Heads of Departments carry-out regular observations of lectures?

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

23. Report on Lecturers reveal that the Lecturers:

- i. Clearly explain the objectives of the Course and have good sense of Instructions:

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

- ii. Have very good grasp of the Subject matter:

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

- iii. Are familiar with inquiry methods of instruction:

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

- Are sensitive to individual differences and encourage personal opinion:

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

- iv. Provide immediate and meaningful feedback to students' efforts:

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

- v. Are effective and efficient instructors:

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

- vi. Complete assigned task in time (Course Units):

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

- vii. Use all the available time assigned on the time table correctly:

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

- viii. Freely discuss with students during lectures:

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

- ix. Mark students' course work and test in time:

Strongly agree Agree Undecided Disagree Strongly dis-agree
() () () () ()

- x. Organize tutorial Classes:

Strongly agree Agree Undecided Disagree Strongly dis-agree

() () () () ()

Are happy with class enrolment:

Strongly agree Agree Undecided; Disagree Strongly dis-agree
() () () () ()

SUFFICIENCY AND QUALITY OF EDUCATIONAL FACILITIES

1. Comment on State of Educational Facilities:

Adequate = Readily Available;

Satisfactory = **Can be accessed;**

Inadequate = **Difficult to access.**

		Adequate	Satisfactory	Inadequate
i.	Library Reading Space	.....	.....	.....
ii.	Library Text	.....	.....	.....
iii.	Library Chairs	.....	.....	.....
iv.	Classroom Space	.....	.....	.....
v.	Classroom Chairs	.....	.....	.....
vi.	Laboratory Space	.....	.....	.....
vii.	Laboratory Chemicals	.....	.....	.....

viii. Laboratory Equipments

COMMENT ON REQUIRED RATIOS AS (Ideal; Good; Acceptable; Can be improved; Unacceptable)

		Ideal	Good	Accept - able	Can be improved	Unacce- ptable
i	Ratio of relevant Text to students	1:5	1:10	1:20	1:30	1:40
ii.	Laboratory equipment to Students' ratio	1:1	1:2	1:4	1:5	1:8
iii.	computers to Students ratio	1:1	1:5	1:10	1:20	1:25
iv.	Access to internet per Student hour	1:3	1:5	1:10	1:20	None

QUALITY OF RESEARCH AND PUBLICATIONS

1. The University has a clear research agenda/portfolio that students are aware of.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
() () () () ()

2. Lecturers in the University are promoted largely because they do research and publish.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
() () () () ()

3. Lecturers in the University present papers in seminars.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
() () () () ()

4. Lecturers in the University encourage student to do research.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
() () () () ()

Lecturers in the University have published many academic papers.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
() () () () ()

5. There are articles from the department that have been published in local and international journals.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
() () () () ()

6. Students are involved in a number of research projects won in the

University.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()

7. There are books with ISBN/ISSN published by staff in the University.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()

8. Some percentage of University budget is allocated to research and publications.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()

9. Some percentage of the University budget is allocated to staff and students for research and publications.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()

INSTITUTIONAL FINANCIAL MANAGEMENT

1. Departments get involved in the University budget process.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()	()	()	()	()

2. The University funds departmental needs/requirements fully.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agr
()	()	()	()	()

3. From where does the University get most of its funding?

Government	()	Students Fees	()
Endowments	()		
Donors, Friends, Development partners			()
Not sure	()		

4. In which area do you think the University prioritizes its funding?

Teaching and learning facilities	()
Academic staff development/staff salary	()
Research and Publications	()
Infrastructure development	()
Not sure	()

5. The budgetary expectation of the University is met annually.

Strongly agree	Agree	Undecided	Disagree	Strongly dis-agree
()		()	()	()

THE UNIVERSITY AND THE COMMUNITY

1. The University runs programmes and projects that focus on the community.

Strongly agree **Agree** **Undecided** **Disagree;** **Strongly dis-agree**
 () () () () ()

2. The University engages the students into a number of apprentices and outreaches.

Strongly agree **Agree** **Undecided** **Disagree;** **Strongly dis-agree**
 () () () () ()

3. Community response to all University programmes is positive.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

4. The University has developed a number of partnerships and collaborations.

Strongly agree **Agree** **Undecided** **Disagree** **Strongly dis-agree**
 () () () () ()

THANK YOU FOR PARTICIPATION IN THIS RESEARCH UNDERTAKING

APPENDIX 5
INTERVIEW GUIDES/FOCUS GROUP DISCUSSION GUIDES
STUDENTS, LECTURERS, HEADS OF DEPARTMENTS AND CORPORATE MANAGERS

1. To establish whether massification is experienced in science-based faculties at Gulu University:
 - i. Is the term massification clear to you? (High enrolment, rapid development of programmes, etc)
 - ii. Based on explanation given, do you think your department is experiencing massification?
 - iii. What reasons do you have to give to confirm that your department is experiencing massification?
2. To find out the influence of university autonomy and governance on management of massification in science-based faculties at Gulu University:
 - i. Are corporate decisions taken based on prescribed guidelines from the University and Other Tertiary Institutions Act (Elaborate);
 - ii. Are the operations of Senate and Council based on prescriptions from the University and Other Tertiary Institutions Act (Elaborate);
 - iii. Do Senate and Council address their mandates to the satisfaction of the university stakeholders (Justify your answer).
3. To establish the influence of efficient and effective teaching and learning on management of massification in science-based faculties at Gulu University:
 - i. What quality benchmarks, are used in your department to guide teaching and learning and academic development as a whole?
 - ii. Have Lecturers in the department discussed and are they conversant with the details of the quality benchmarks?
 - iii. In which operational areas of the department do you use the quality benchmarks most?
 - iv. Is the management of teaching and learning satisfactory to both Students and Lecturers?

- v. Does the University observe the semester schedule promptly?(Give reasons).
4. To analyse the contribution of research and publications on management of massification in science-based faculties at Gulu University:
- i. How has the University made research and publication one of it's a core functions (Give details of researches and publications carried in your department).
 - ii. What challenges does the University face in the area of research and publications?
5. To determine the influence of good institutional financial management on management of massification in science-based faculties at Gulu University:
- i. Heads of Departments, Lecturers and Students get involved in the university's budget process;
 - ii. The budget process at Gulu University is managed in line with the Public Finance Regulation Act;
 - iii. Funds budgeted for research, publications and other educational resources are sufficient and well managed (Justify your answer).
6. To investigate the impact of quality recruitment of academic staff on management of massification in science based faculties at Gulu University:
- i. Does the University have adequate, committed and quality academic staff (Justify)?
7. To assess the efficient and effective utilization of education resources on management of massification in science-based faculties in Gulu University:
- i. Does University Library address the development of academics demands adequately?

- ii. Comment on the management of practical disciplines in the University.
- 8. To find out the extent to which university and community collaboration has influenced management of massification in science-based faculties in Gulu University:
 - i. Mention a few successful projects managed by the University in the community.
 - ii. Mention a few partnerships and collaborations that have been developed.

THANK YOU FOR PARTICIPATING IN THIS RESEARCH

APPENDIX 6

INTERVIEW GUIDES FOR HEADS OF INSTITUTION

1. Name of Institution.....
2. Does your institution relate with Gulu University in any way?
 Yes () No ()
3. State at least three areas of relationship:
 -
 -
 -
4. Do you have staff trained from Gulu University in your institution?
 Yes () No ()
5. Comment on the performances of staff trained from Gulu University working in your institution compared to those trained from other universities:
 -
 -
 -
6. Mention at least two positive consequences that your organization attributes to Gulu University?
 -
 -
7. On the other hand what negative experiences does your organization draw on Gulu University?
 -
 -
8. Are there issues based on interactions with your staff trained from Gulu University that you consider needed improvement.
 -

NB: USE BACK OF SHEET FOR FURTHER COMMENTS

APPENDIX 7
INTERVIEW GUIDES FOR THE PUBLIC

1. Gender:
.....
2. Do you consider yourself a stakeholder with Gulu University in any way?
Yes () No ()
3. State at least three areas of relationship:
 -
 -
 -
4. Comment on the performance of Gulu University over the years in promotion of quality education:
 -
 -
 -
5. Mention at least three areas that your community has benefitted in from Gulu University?
 -
 -
 -
6. Are there areas that you consider needed improvement in Gulu University in her quest to deliver quality education?
 -
 -
 -

THANKS FOR YOUR PARTICIPATION IN THIS RESEARCH

APPENDIX 8

OBSERVATION CHECKLIST

Administration

1. Enrolment records;
2. Graduation records;
3. List of staff and their qualifications.

Teaching and Learning

1. Classroom condition:- Size, seating arrangement, chairs, aeration, timetable, etc
2. Teachers' and learners' disciplines;
3. Time management;
4. Availability of teaching/learning aid;
5. Teacher-learner interaction;
6. Teacher-Learner motivation;
7. Language of communication;
8. Course outline;
9. Course work and unit test results;
10. Semester regulations and others.

Research and Publications

1. Wall displays;
2. Brochures on research information;
3. Published journal articles, etc

Educational Facilities

1. Text books;
2. T/Learning equipment, apparatus, specimen, modules, etc ;
3. E-learning resources;
4. Internet connectivity;
5. Computers;
6. Projectors;
7. Chalk board and soft boards;
8. Departmental Library;
9. Lecturers space (Offices and or study space);
10. Faculty Library;
11. Faculty water and sanitation.

APPENDIX 9
Estimating Content Validity of Instruments
APPENDIX 9A
Calculation of CVI for Background Information

Item No. (Total No. of Experts: 5) CVI

Corporate Management

	Valid	Invalid	E-(N/2)/ (N/2)
1	5	0	1
2	5	0	1
3	5	0	1
4	5	0	1

$$\begin{aligned}
 \text{CVI} &= \frac{\text{No. of items rated as valid}}{\text{Total number of items}} \\
 &= \frac{4}{4} \\
 &= 1
 \end{aligned}$$

Heads of Department

	Valid	Invalid	E-(N/2)/ (N/2)
1	5	0	1
2	5	0	1
3	5	0	1
4	5	0	1
5	5	0	1
6	5	0	1
7	5	0	1
8	5	0	1
9	5	0	1

$$\begin{aligned}
 \text{CVI} &= \frac{\text{No. of items rated as valid}}{\text{Total number of items}} \\
 &= \frac{9}{9} \\
 &= 1
 \end{aligned}$$

Lecturer

	Valid	Invalid	E-(N/2)/ (N/2)
1	5	0	1
2	5	0	1
3	5	0	1
4	5	5	1
5	5	0	1

$$\begin{aligned}
 \text{CVI} &= \frac{\text{No. of items rated as valid}}{\text{Total number of items}} \\
 &= \frac{5}{5} \\
 &= 1
 \end{aligned}$$

Students

	Valid	Invalid	E-(N/2)/ (N/2)
1	5	0	1
2	5	0	1
3	5	0	1
4	5	0	1
5	5	0	1
6	5	0	1
7	5	0	1

$$\begin{aligned}
 \text{CVI} &= \frac{\text{No. of items rated as valid}}{\text{Total number of items}} \\
 &= \frac{7}{7} \\
 &= 1
 \end{aligned}$$

APPENDIX 9BCalculation of CVI for Quality of Institutional Autonomy and Governance

Item No.	(Total No. of Experts: 5)		CVI
	Valid	Invalid	E-(N/2)/ (N/2)
1	5	0	1
2	5	1	0.6
3	5	0	1
4	5	1	0.6
5	5	1	0
6	5	0	1
7	5	0	1
8	5	1	0.6
9	5	0	1
10	5	2	0.2
11	5	0	1
12	5	0	1

$$\begin{aligned}
 \text{CVI} &= \frac{\text{No. of items rated as valid}}{\text{Total number of items}} \\
 &= \frac{55}{60} \\
 &= 0.92
 \end{aligned}$$

APPENDIX 9 CCalculating CVI for quality of teaching, learning and evaluation

Item No.	(Total No. of Experts: 5)		CVI
	Valid	Invalid	E-(N/2)/ (N/2)
1	5	0	1
2	5	0	1
3	5	0	1
4	5	0	1
5	5	2	0.2
6	5	1	0.6

7	5	1	0.6
8	5	0	1
9	5	0	1
10	5	0	1
11	5	0	1
12	5	0	1
13	5	0	1
14	5	0	1
15	5	0	1
16	5	0	1
17	5	1	0.6
18	5	0	1
19	5	0	1
20	5	2	0.2
21	5	0	1
22	5	0	1
23	0	0	0
i	5	0	1
ii	5	0	1
iii	5	0	1
iv	5	2	0.2
v	5	0	1
vi	5	0	1
viii	5	0	1
ix	5	0	1
x	5	0	1
xi	5	0	1
xii	5	0	1

$$\begin{aligned}
 \text{CVI} &= \text{No. of items rated as valid/Total number of items} \\
 &= 156/165 \\
 &= 0.96
 \end{aligned}$$

APPENDIX 9 D

Calculating CVI for Sufficiency and quality of Educational Facilities

Item No.	(Total No. of Experts: 5)		CVI E-(N/2)/ (N/2)
	Valid	Invalid	
i	5	1	0.6
ii	5	0	1
iii	5	2	0.2
iv	5	0	1
v	5	0	1
vi	5	1	0.6
vii	5	0	1
viii	5	1	0.6

$$\begin{aligned}
 \text{CVI} &= \text{CVI} = \text{No. of items rated as valid/Total number of items} \\
 &= 35/40 \\
 &= 0.86
 \end{aligned}$$

APPENDIX 9 E

Calculating CVI for Comments on required ratios

Item No.	(Total No. of Experts: 5)		CVI
	Valid	Invalid	E-(N/2)/ (N/2)
i	5	1	0.6
ii	5	2	0.2
iii	5	0	1
iv	5	0	1

$$\begin{aligned}
 \text{CVI} &= \text{No. of items rated as valid/Total number of items} \\
 &= 17/20 \\
 &= 0.85
 \end{aligned}$$

APPENDIX 9 F

Calculation of CVI for Quality of Research and Publications

Item No.	(Total No. of Experts: 5)		CVI
	Valid	Invalid	E-(N/2)/ (N/2)
1	5	0	1
2	5	1	0.6
3	5	0	1
4	5	2	0.2
5	5	1	0.6
6	5	2	0.2
7	5	1	0.6
8	5	0	1
9	5	0	1
10	5	1	0.6

$$\begin{aligned}
 \text{CVI} &= \frac{\text{No. of items rated as valid}}{\text{Total number of items}} \\
 &= 42/50 \\
 &= 0.84
 \end{aligned}$$

APPENDIX 9 GCalculating CVI for Institutional Financial Management

Item No.	(Total No. of Experts: 5)		CVI E-(N/2)/ (N/2)
	Valid	Invalid	
1	5	0	1
2	5	0	1
3	5	1	0.6
4	5	0	1
5	5	0	1

$$\begin{aligned}
 \text{CVI} &= \text{CVI} = \text{No. of items rated as valid/Total number of items} \\
 &= 24/25 \\
 &= 0.96
 \end{aligned}$$

APPENDIX 9 HCalculating CVI for University and the Community

i	5	1	0.6
ii	5	1	0.6
iii	5	2	0.2
iv	5	1	0.6

$$\begin{aligned}
 \text{CVI} &= \text{No. of items rated as valid/Total number of items} \\
 &= 15/20 \\
 &= 0.8
 \end{aligned}$$

APPENDIX ICalculation of CVI for Interview and Focus Group Discussion Guides

Item No.	(Total No. of Experts: 5)		CVI E-(N/2)/ (N/2)
	Valid	Invalid	
1			
i.	5	1	0.6
ii.	5	2	0.2
iii.	5	1	0.6
2			
i.	5	2	0.2
ii.	5	1	0.6
iii.	5	0	1
3			
i.	5	1	0.6
ii.	5	1	0.6
iii.	5	2	0.2
iv.	5	1	0.6
v.	5	2	0.2
4			

i.	5	0	1
ii.	5	2	0.2
5			
i.	5	0	1
ii.	5	1	0.6
iii.	5	2	0.2
6			
i.	5	1	0.6
7			
i.	5	1	0.6
ii.	5	2	0.2
8			
i.	5	3	-0.2
ii.	5	1	0.6
CVI	= $\frac{\text{No. of items rated as valid}}{\text{Total number of items}}$		
	= $78/105 = 0.74$		

APPENDIX 9 J

Calculation of CVI for Interview Guides for Heads of Institution

Item No.	(Total No. of Experts: 5)		CVI
	Valid	Invalid	$E-(N/2)/(N/2)$
1	5	0	1
2	5	1	0.6
3	5	1	0.6
4	5	0	1
5	5	1	0.6
6	5	0	1
7	5	2	0.2
8	5	0	1
CVI	= $\frac{\text{No. of items rated as valid}}{\text{Total number of items}}$		
	= $35/40$		
	= 0.93		

APPENDIX 9 K

Calculation of CVI for Interview Guides for the Public

Item No.	(Total No. of Experts: 5)		CVI
	Valid	Invalid	$E-(N/2)/(N/2)$
1	5	0	1
2	5	1	0.6
3	5	0	1
4	5	2	0.2
5	5	0	1
CVI	= $\frac{\text{No. of items rated as valid}}{\text{Total number of items}}$		

Total number of items
=
22/25
=
0.88