WEBOMETRICS RANKING IN RELATION TO QUALITY EDUCATION AND RESEARCH IN ACADEMIC INSTITUTIONS IN KENYA: THE CASE OF UNIVERSITY OF NAIROBI

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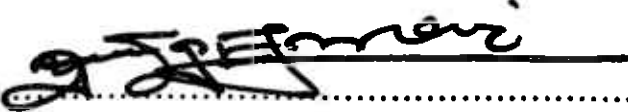
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DECLARATION

This is my original work and has not been presented to any other university or college for an award of a degree or certificate.

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This research project has been submitted for examination with our approval as university supervisors

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ii

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DEDICATION

I dedicate this work to my family members whom we pulled together even at the most difficult time in the period of my study.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS AND ACRONYMS

ARWU	Academic Ranking of World Universities
E-JOURNALS	Electronic Journals
E-RESOURCES	Electronic Resources
HEEACT	Higher Education Accreditation Council of Taiwan
HTML	Hypertext Mark-up Language
ICT	Information Communication Technology
IHEP	Institution of Higher Education Policy
KLISC	Kenya Library and Information Services Consortium
MBA	Master in Business Administration
MENA	Middle East and North Africa
QS	Quacquarelli Symonds
SPSS	Statistical Package for Social Sciences
UNESCO	United Nations Educational, Scientific and Cultural Organization
UON	University of Nairobi
URL	Uniform Resource Locator
WIF	Web Impact Factors
STATA	Statistics and Data
SCI	Science Citation Index
FTE	Full time equivalent
ESI	Essential Science Indicators

ABSTRACT

The study aimed to find out the relationship between webometrics ranking and the quality of education and research in academic institutions in Kenya with particular reference to the University of Nairobi. The objectives of the study were to; find out the relationship between webometrics ranking and the quality of research and education at the university of Nairobi, assess the perceptions and attitudes of staff and students in the select university, identify the strategies that enabled the selected university to be ranked highly in webometrics ranking of universities, establish major challenges faced in webometrics ranking process and suggest a framework of strategies for high webometrics ranking. This is a baseline study on webometrics ranking in Kenyan institutions of higher education that suggests solutions to strengthen academic excellence and competitiveness among institutions. The study poses the need for institutions to strive for quality hence uplifting the standards of education in Kenya in particular and Africa in general. Descriptive survey involving both quantitative and qualitative approaches was applied. Structured questionnaire and document reviews were used to gather data. Respondents from the selected university included staff and students. Quantitative data was analyzed with the aid of tables, pie charts and graphs to show different patterns of data categories. Qualitative data was analyzed by noting down the dominant themes and drawing conclusions from the respondent's feedback. The study established that webometrics ranking promote quality of education and research in academic institutions, strategies that lead to high performance in 2015 webometrics ranking include open access policy, scholarly research and publications, marketing and branding, collaborations and partnership, benchmarking, creation of user friendly websites and enrichment of institutional repositories. Absence of digital repositories and lack of information communication technology are the major risks faced in webometrics ranking of institutions of higher learning in Kenya. The study recommends enrichment of repositories content, provision of advanced modern facilities, use of sustainability strategies, education and training opportunities for staff and students and suggests a framework for strategies on webometrics ranking.

CHAPTER ONE
INTRODUCTION

1.0 Introduction

This chapter presents the background information to the study, describes the study problem, significance of the study and its aim and objectives, research questions, assumptions, scope and limitations. Terms and concepts used in the study are also discussed here.

1.1 Background to the Study

Webometrics ranking involves ranking system for the world's universities based on a composite indicator that takes into account both visibility and activity measures (Drussa 2014:1). Webometrics ranking system ranks universities based on how strong the universities' presence in the websites by its web domain, repositories and informal scholarly communication. The system not only focuses on research results, but also pays attention to web based practices such as; university activities, quality and research results which are reflected through web presence (Webometrics, 2011:1). In addition, Aguillo etal., (2008: 233) notes that scholars are turning to the internet to find scientific information and institutions of higher learning are devoting more and more resources to improving their presence in the web.

The practice of ranking universities in the United States of America (USA) and many other countries around the world has become common although the ranking of universities on regional or global level is much more recent phenomenon. Globalization has had a profound effect on the way companies and countries do business, so has it had the effect on the way colleges market themselves to students, and in the way students go about selecting own study destinations. In most countries, higher education has traditionally been viewed as the public good provided and guaranteed by the state. Students are crossing borders to attend universities and colleges outside countries of origin while universities and colleges are increasingly looking for ways to export

1

services to students in home countries. This "export" of university services is most often achieved by franchising degree programs, opening branch campuses, or by developing the means to offer programs remotely via the internet (World Education News and Services, 2015:4).

Research findings in London and China reveal that the provision of higher educational opportunities has become increasingly international and thus, the need for reliable means of institutional comparisons. Organizations compile and publish annual global university rankings, with the two most frequently cited being the Academic Ranking of World Universities, compiled by researchers from the Institute of Higher Education Shanghai Jiaotong University, and the Times Higher University World Rankings, complied by employees from the Times Higher Education Supplement, based in London. These two rankings currently represent the most comprehensive efforts to compare universities across borders, although it should be noted that in specific fields such as business administration, top schools have been ranked by a number of different publications for some time. Business Week started the trend in 1988, and the Economist, Forbes, The Wall Street Journal, and The Financial Times have all followed suit (World Education News and Services, 2015: 2).

Higher education institutions use rankings as marketing and promotion tools to determine educational, research or business excellence that many candidate students use as a guide to help make choices about the institutions to submit an application. Marketing based on rankings may facilitate increased options for funding and may assist the institution in attracting high quality scholars which in turn can further enhance the university's reputation. Institutions can also employ ranking criteria for strategic planning and quality improvement purposes as well as to stimulate the culture of quality (Sadlak, 2011: 3).

Institutions worldwide are relying on consortiums as a bid to enhance and strengthen associations among institutions for the purpose of improved and expanded economic collaboration to achieve mutually beneficial goals. Most recently, as information and communication technologies have increased the availability of resources for research and development purposes, universities have joined with corporations and government agencies to form national and international consortia (Education Encyclopedia, 2015:1). Kenya Library and Information Services Consortium (KLISC) was established in 2003 with the main objective of collective subscription to electronic resources to cope with the increasing cost of information resources. The consortium draws its membership from public/national libraries and research institutions with its secretariat based at the University of Nairobi library (Kenyatta University Library, 2014). KLISC has conducted several training workshops to enhance staff capacity as well as subscription to online resources which is crucial to an institution webometrics ranking performance (University of Nairobi Library, 2015:1).

The development of digital repositories by institutions of higher learning and education is fundamental in supporting research publication. Ezema (2013:10) argues that, since other channels of communicating research findings particularly the journals have been saddled with access barriers, the institution repository has come to provide an alternative channel of publishing scholarly research which is free to the entire scholarly community. Consequently, repositories increase the visibility of the authors and promotion of the global ranking of the universities; increase research impact of the authors, facilitating the dissemination of scholarly research, globalization of research findings and promotion of international collaboration among researchers.

1.1.1 Context of the Study

The study was carried out at the leading institution of higher learning in Kenya, The University of Nairobi. The University of Nairobi has a total population of 68,000 students as compared to 2011 where the student population was 61,912.The university has launched several policy frameworks and introduced module 2 and module 3 degrees to cope with the demand of higher education in Kenya. The vision of the university is world-class university committed to scholarly excellence whose mission is to provide quality university education and training and embody the aspirations of the Kenyan people and the global community through creation, preservation, integration, transmission and utilization of knowledge (University of Nairobi, 2010: 1). The university has rapidly evolved into world class institution, and was ranked number 1 of all public and private universities in Kenya , number 7 in Africa and ranked 855 worldwide by the webometrics ranking in 2015 (Webometrics Ranking of Universities, 2015: 1).

The University of Nairobi is committed to open and free access to information and takes responsibility for dissemination for research outputs. This commitment is rooted in the universities mission and undergirded by the core values of innovativeness, professionalism and cooperate social responsibility. The university through the library has established the digital repository that provides long term preservation and showcases scholarly outputs in relation to teaching, learning, research, community service and consultancy (University of Nairobi, 2015:4). Access to electronic resources is enhanced through expansion of computer laboratories and other access points throughout the university.

In addition, the university through the library has continuously shown mutual support to the open access concept by holding successful open day/open access week every year since 2011. The aim of the open day is to create awareness on library resources and promote access to free global information resources including the institutional repository (University of Nairobi Library, 2015: 8). The University of Nairobi webometrics ranking performance is the best result posted by any local university since the advent of web ranking in 2004. In the July 2014 ranking, the University of Nairobi was 1st in East Africa, 9th in Africa and 907 worldwide. The web ranking complement the government performance contracting ranking in which the university of Nairobi has consistently maintained position one ahead of other public universities and institutions (University of Nairobi, 2014:1).

1.2 Statement of the Problem

In the 21st Century higher education has become globalized and the focus has shifted to worldwide ranking with each system using different set of weighted indicators or metrics to measure higher education activity (Ranking Web of Universities, 2014:1). Indeed, Andrejs (2011:20) notes that rankings can inform the student's choice of institution or promote the culture of transparency, strengthen competition among institutions and often bring about policy change in universities, which strive to improve own standing in the league tables. Rankings are used as a basis for funding allocations to universities, as well as for developing national or regional higher education policies. In addition, key stakeholders use rankings to influence their decisions about accreditation, funding, sponsorship and employee recruitment.

The advent of information communication (ICT) usage in Kenya and Africa region is not comparable to westernized countries such as Europe and United States of America. Comparing Africa to the world cannot occur in one day as in the west the practices of digital repositories has

5

been in place for a longer period of time. Institutions in the west have advanced digital repositories unlike in Africa where we are scaling up to their level with the need of developing digital repositories emanating in the recent years. The need to market and promote digital repositories is of importance in determining webometrics ranking as it ties with electronic resources and journals which additionally promotes visibility of institutions through usage statistics.

Studies by Obachi &Kachero (2011:1) indicate that one common challenge in Africa is access to local research content. The existing research output in developing countries is often not available even within their own borders. On the same note, Ezema (2013:5) points out that, Africa as a continent is rich with local content materials that are critical in propelling national development. The greatest challenge however, is the ability of information professionals to bring together abundant local information resources and make them accessible to the global scholarly community. In Kenya there are no known baseline studies targeting webometrics ranking in institutions of higher learning. The study therefore, focuses on appropriate strategies that enhance and harmonize the whole procedure of web-ranking and bring out equilibrium of benefit to the growth of all institutions in a country in addition to competition and quality of the education system.

1.3 Aim of the Study

The aim of the study was to examine the relationship between webometrics ranking and its role in promoting quality education and research in academic in institutions in Kenya with reference to University of Nairobi and suggest appropriate solutions to enhance the practice.

1.3.1 Objectives of the Study

The study was guided by the following objectives:

1. Find out how webometrics ranking promotes quality of research and education in academic institutions in Kenya.

2. Assess the perceptions of staff and students on webometrics ranking in institutions of higher learning in Kenya.

3. Examine the strategies used by the select academic institution to be rated highly in webometrics ranking of universities.

4. Establish challenges faced in relation to webometrics ranking of universities in institutions of higher learning in Kenya.

5. Suggest framework of strategies for high webometrics ranking in institutions of higher learning in Kenya.

1.4 Research Questions

The study was guided by the following research questions:

1. How does webometrics ranking promote the quality of research and education in academic institutions in Kenya?

2. What are the perceptions of staff and students towards webometrics ranking in institutions of higher learning?

3. What strategies are used by the selected academic institution to be rated highly in webometrics ranking of Universities?

4. What are the challenges faced in support of webometrics ranking in the selected institution of higher learning?

5. What strategy can be put in place to enable high webometrics ranking of institutions of high learning in Kenya?

1.5 Assumptions of the Study

The study assumed that institutions of higher learning in Kenya have put across appropriate strategies to enable them being ranked highly, access and use of internet communication technologies in institutions of higher learning promotes webometrics ranking and lack of awareness or knowledge on factors that enhance webometrics ranking will lead to low rankings.

1.6 Scope of the Study

The study was carried out at the University of Nairobi where it focused on the latest Webometrics ranking of universities. The study involved collecting data from staff and students of university of Nairobi and available literature on Webometrics ranking.

1.7 Limitations of the Study

Findings of the study may not necessarily reflect the true situations in other institutions of higher learning in other parts of the country due to diversity in terms of disciplines, courses offered and the year of commencement of institutions.

Collection of data was a challenge to the researcher as it was collected in August when students who formed part of the targeted population of research were on holiday.

Strathmore University which formed Part of the study area failed to grant the researcher permission to collect data from the institution hence prompting the researcher to conduct research only at the University of Nairobi

1.8 Significance of the Study

The study findings are expected to enhance and support web ranking initiatives in the country and beyond emphasizing more on specified web ranking strategies and procedures in a bid to improve on quality of education. The study shall be of benefit to the commission of higher education as it will act as a baseline study on Webometrics ranking in Kenya institutions of higher learning and suggest a way forward to strengthening academic excellence and competitiveness among institutions. The above will pose the need for institutions to strive for quality hence uplifting the quality of education in Kenya as a whole for development as a country.

The study intends to make significant contribution of adding knowledge to web ranking practices as it is expected to enhance visibility of institutions of higher learning through making popular the strategies that are to be put in place. This will market institutions of higher learning and showcase richness of content that is offered by institutions, foster collaborations, funding and even increase student enrollment. The study endeavors to enrich existing literature linked to Webometrics ranking in research and partnerships. This will enhance quality output of scholars through consortia and even cut on funds.

1.9 Operational Terms and Concepts

Webometrics Ranking

The aspect of assigning positions to institutions of higher learning resulting from their performance based on measured parameters.

Web Presence

The term is used in reference to an institution's ability to appear on the internet.

Performance Indicators

Key aspects taken into account when evaluating an institution's performance on the web in terms of research, publications, student staff ratio and the disciplines offered.

Institutions of Higher Learning

Private or public university, college, campus or any other institution that offers a level of academic education and professional training that leads to full academic and or professional qualifications and proficiency.

Sustainability Strategies

Measures put in place to ensure that an institution maintains its performance in a bid to withstanding the test of time.

Research Institutions

Centres/Institutions designed specifically to carry out/give high priority to research.

Academic Institutions

Institutions of higher education and research, that offers degrees at the end of the program.

University of Nairobi

The leading public institution of education and learning in Kenya,located in Nairobi.

Web Impact factor

Measure of the influence of a site across the entire web calculated according to the number of links from other sites.

1.10 Chapter Summary

The chapter discussed the introduction and background of the study, statement of the problem, aim of the study, highlighted the objectives, research questions to be used in the study, significance, assumptions and scope of the study. The chapter wrapped up with the definition of concepts and terms used in the study.

CHAPTER TWO
LITERATURE REVIEW

2.0 Introduction

This chapter will provide systematic review of literature on Webometrics ranking based on the already available literature. The review is based on answering the specific research questions of the study highlighting various issues of Webometrics ranking.

2.1 Development of Webometrics Ranking

Webometrics was coined in 1997 by Tomas Almind and Peter Ingwersen (1997: 404), in recognition that informetric analyses could be applied to the web. Webometrics refers to the quantitative analysis of activity on the World Wide Web like downloads, which draws on informetric methods (Kousha etal., 2010). The introduction of the web impact factor (WIF) metric to assess the impact of the website or other area of the web based upon the number of hyperlinks relied on webometrics (Ingwersen 1998: 236). Web impact factors seemed to make sense because more useful or important areas of the web would presumably attract more hyperlinks than average. The logic of the metric was derived from the importance of citations in journal impact factors, but WIFs had the advantage of easily being calculated using the new advanced search queries introduced by AltaVista, a leading commercial search engine at that period. Webometrics subsequently rose to become the large coherent field within information science, from the bibliometric perspective (Zhao & Strotmann 2008: 916), encompassing link analysis, web citation analysis and range of other web-based quantitative techniques.

Webometrics ranking became useful in various applied contexts, such as to construct the world webometrics ranking of universities (Thelwall 2010: 4) and for scientometric evaluations or investigations of bodies of research or research areas (Aguillo etal., 2006 : 1297).The central hypothesis behind webometrics ranking is that; web presence is a reliable indicator of the global

performance and prestige of the universities and as such, is an indirect way to measure all the university missions (teaching, research, transfer). The web is universally recognized as one of the most relevant tools for scholarly communication, although rarely these indicators are used for the evaluation of the scientific research and the academic performance of universities. Webometrics indicators are provided to show the commitment of the institutions to web publication.

Web presence measures the activity and visibility of the institutions and it is a good indicator of impact and prestige of Universities. Cyber metrics lab is devoted to the quantitative analysis of the internet and Web contents especially those related to the processes of generation and scholarly communication of scientific knowledge. This is the new emerging discipline that has been called Webometrics. Webometrics ranking intend to motivate both institutions and scholars to have a web presence that reflect accurately their activities. If the web performance of the institution is below the expected position according to the academic excellence, university authorities should reconsider the web policy, promoting substantial increases of the volume and quality of their electronic publications (Webometrics Ranking of Universities, 2015: 2)

Webometrics ranking measures the size and 'visibility' of university web pages (Aguillo et al., 2008: 48). Size is characterized by the number of pages on the website of the university, as well as by the number of publications and of 'rich files' (pdf, .ppt, .doc and .ps). The 'visibility' of the university is measured by the number of inward links to the university website. Webometrics recognizes that the Internet is the repository for the vast number of documents and the powerful vehicle for knowledge dissemination and access. Ranking involves measuring the volume, visibility, and impact of web pages published by universities, with special emphasis on scientific output (refereed papers, conference contributions, preprints, monographs, theses, and reports),

but also examines other materials (courseware, seminars or workshop documentations, digital libraries, databases, multimedia, and personal pages and blogs) and the general information on the institution, the departments, research groups or supporting services, and people working or attending courses.

Ranking can be undertaken using a number of approaches that include in particular, link analysis, web citation analysis, search engine evaluation and purely descriptive studies of the web (Thelwall, 2007:4).Webometrics team uses commercial search engines to collect data as the websites can be trawled directly using specially designed robots that collect basic information through hyper textual navigation or the statistics can be extracted from previously trawled databases obtained from commercial search engines. Despite coverage biases or other shortcomings, if the webpage is not indexed by the engine, then that page does not exist for any purpose (Aguillo etal., 2009:242). Webometrics Ranking is updated every six months; data is collected in January and July and published one month later. Data collection is automatic, but the final positions of universities in the league table are calculated manually and comparisons with previous years are made.

2.2 Global Status of Webometrics

The emergence of ranking systems can be traced back in 1865 to European studies that aimed to define whether environment or heredity was the determining factor in producing man of genius. It was attempted to assess the quality of institutions and affiliated scholars in science and medicine. The results influenced the thinking of educators regarding quality assessment. During twentieth century several evaluation and ranking systems for educational institutions appeared from time to time. Present form of ranking educational institutions was originally introduced by

US News and World Report over two decades ago in order to publish transparent comparative data about the institutions. With the passage of time, more and more systems of ranking kept emerging with different aims and objectives. Rankings are subjectively perceived as indicative of quality of the institutions based on some combination of the empirical data or opinion derived from different surveys of scholars, academics, alumni, present and prospective students, employers of the institutional graduates, research publications and their citations etc. Ranking lists are prepared for the institutions, departments, programs, specific subjects or fields (Ismail, 2008: 1).

The first ranking of North American University dates from 1983, and owes its originality to studies in 1870, when bodies with connections to the university system of that country began to evaluate institutions of higher learning. The first international ranking of institutes of higher education was carried out by the Shanghai Jiao Tong University, located in Shanghai, China and was known as "the academic ranking of world universities" (ARWU), whose publication caused quiet amount of disquiet, especially in Europe, because institutions in the United States and the United Kingdom were dominant in the listing for both the 20 and 100 best universities. In 2004 there was the creation of the European response to the ARWU in the form of the Times Higher Education Supplement World University Ranking, the Times Higher Education (Scielo, 2013:1)

Currently, the three most well-known ranking systems are the performance rankings of scientific papers for world university directed by Higher Education Evaluation and Accreditation Council of Taiwan (the HEEACT Ranking, 2007–present), the Academic Rankings of World universities by Shanghai Jiao Tung University (ARWU 2003–present) and QS World University Rankings by Times Higher Education, (QS ranking, 2004–9), which split into two independent ranking programs in 2010 (QS World University Rankings and World University Rankings). The three

programs vary in methodologies, although all of them heavily rely on the research production of universities, and above all, scientific papers indexed in the ISI citation index databases (Huang, 2011:1).

There are also rankings that deal with professional schools and programmes. Internationally, the most popular are those of business schools and MBA programmes from publications such as the Financial Times, The Economist, the Wall Street Journal and Business Week. As such, these rankings are perceived as important supplements, relevant to professional accreditation because of the attention given to rankings by various professional bodies (Hazelkorn, 2009).The latest global Webometrics ranking by Times higher education (2014-15) indicate that, the United States had 15 slots among the top 20 universities, United Kingdom with 3, while Switzerland and Canada each with 1 position. African universities did not feature among the top 100 institutions. The best performing African university was the University of Cape Town in South Africa which was ranked position 124 with overall score of 52.6 per cent. This compares dismally with California Institute of Technology (USA) that clinched the top position with overall score of 94.3 per cent (World University Ranking, 2015: 1).

2.3 Webometrics Ranking in Kenyan Higher Education

Since the 1960's ranking of universities in Africa has been speculative rather than empirical. Two indicators have typically featured. These are the age of the institution and employers perception of the quality of graduates. Taiwo (1981:1) in his article "in the mind of Kenyans", opines that, the University of Nairobi (established 1956) should be better in quality of training than Kenyatta University (established 1965). The same order of ranking emerges when employers rank these universities on assumptions that graduates of University of Nairobi should be better than graduates of other universities in Kenya (Okebukola, 2013: 142).

Studies by Taiwo (1981), further states that while there are complex variables implicated in the perceived high ranking of these institutions such as the quality of facilities and staff, strict compliance with standards to match top-rate universities in Europe, quality of leadership as well as, quality and quantity of students, the rankings were not based on verifiable data. From early 2000, speculative ranking began to yield for the empirical. Global rankings provided a template for more transparent and objective data collection, analysis and reporting and also provided a menu of indicators that could be adopted for local context. The first Times higher education ranking in 2004, which showed the big names in the higher education system in Africa by the conjectural ranking not listed in the Times league tables, jolted stakeholders, governments, university managers, students and parents, reacted angrily which was an awakening goal to improve quality.

In 2009 global Webometrics rankings, no Kenyan university featured in the top 500. In 2012 the University of Nairobi (UoN) was confirmed as the top ranked University locally according to Webometrics Ranking of World universities. UoN was ranked 2nd in East Africa, 17th in Africa and 1,367 worldwide, a massive improvement from previous rankings and the best position ever attained by a local university. It is second to Makerere University while University of Cape Town leads the rankings in Africa. The top position in the world was dominated by universities from the United States which scooped 394 positions among the top 1000, and was followed by Canada and Western Europe countries. In Africa, only University of Cape Town was ranked among the top 500 at position 366. Eight of the top ranked universities in Africa were from South Africa while two were from Egypt. Other Kenyan universities ranked in Africa included Strathmore (54), Egerton (60) and Kenyatta University (6) (University of Nairobi, 2012:1).

2.4 Webometrics Ranking and Quality of Research and Education

The aim of Ranking is to promote Web publication, support open access initiatives, electronic access to scientific publications and other academic materials/publications. However, web indicators are very useful for ranking purposes too as they are not based on number of visits or page design but on the global performance and visibility of the universities. As other rankings focused only on a few relevant aspects, specially research results, web indicators based ranking reflects better the whole picture, as many other activities of professors and researchers are showed by their web presence (Ranking web of universities, 2014:2). Moreover, universities that rank top, presumably, are those that have integrated the web into their research, teaching and learning culture. They tend to have more resources in the web, and also tend to have more links to and from other sites. They are therefore perceived to be more globalized. This increases their perceived impact, improves their visibility and makes stakeholders perception about them positive. On the contrary, if the university is ranked low in Webometrics; setbacks encountered may be lowering of the esteem of the university in the eyes of stakeholders, especially potential students and funding agencies; and few/no academic exchange forums with reputable universities from other parts of the world for teaching (Utulu, 2007: 2).

Webometrics ranking is significant in promoting quality of research and education in a variety of ways as proposed by Sadlak (2011: 3); Webometrics ranking provides the public with information (whatever the specifics of the ranking format) on the standing of higher education institutions for individual or group decision-making (potential students, parents, politicians, foundations, funding agencies, research councils, employers, international organizations); foster's healthy competition among higher education institutions; provides additional evidence about performance of particular higher education institutions and/or study programmes; stimulates the evolution of centres of excellence; and provides additional rationale for allocation of funds.

The Institution of Higher Education Policy (IHEP) study, further suggested that rankings foster collaboration, such as research partnerships, student and faculty exchange programmes, and alliances. More specifically (IHEP, 2009:2) states that: "rankings can be important starting points to identify institutions with which to collaborate and partner. Webometrics ranking of institutions of higher learning has enabled institutions to support open access initiatives and electronic access to scientific publications and other academic material, aid in creation of knowledge through call for scholarly publications and aid in dissemination and sharing of knowledge through digital repositories hence supporting preservation of local content. Rankings also help by encouraging the collection and publication of reliable national data on higher education (Rauhvargers, 2011: 11), as well as more informed policy making. All higher education institutions are also increasingly called on to use data for decision-making purposes and to document student and institutional success (IHEP, 2009: 2).

From an international standpoint, rankings encourage the search for common definitions of those elements on which data is collected. The results of global rankings can stimulate national debate and focused analysis of the key factors determining success in rankings, which in turn may lead to positive policy changes at system level (Rauhvargers, 2011:48). It has also been argued that rankings may also promote discussion on how to measure institutional success and improve institutional practices (IHEP, 2009); prove to be a useful starting point for the internal analysis of university strengths and weaknesses (van etal., 2012:76); and may also help to convince the general public of the need for university reform (Hazelkorn, 2011: 3).

However, there is also a strong risk that in trying to improve their position in the rankings, universities are tempted to enhance their performance only in those areas that can be measured by ranking indicators (Rauhvargers, 2011: 48). Some indicators reflect the overall output of universities (in terms of their Nobel laureates, articles and citations); others reflect greater selectivity with a strong emphasis on research and individual reputation rather than on teaching and learning. Most rankings focus disproportionately on research, either directly by measuring research output or indirectly by measuring the characteristics of research-intensive universities (such as low student/staff ratios or peer reputation).

Rankings have a strong impact on the management of higher education institutions. There are various examples of cases in which the salary or positions of top university officials have been linked to their institution's showing in rankings or where improved performance in the rankings is used to justify claims on resources (Espeland etal., 2007 : 13; Hazelkorn, 2011: 10). It is also easier for highly ranked universities to attract foreign students. In this way global rankings tend to favour the development or reinforcement of stratified systems revolving around "world-class universities" thus also encouraging a "reputation race" in the higher education sector (van, 2008: 157).

2.5 Performance Indicators in Webometrics Ranking

Webometrics Ranking measures volume, visibility and impact of university WebPages with special emphasis on scientific output. Creators of webometrics believe that strong web presence provides information on a wide variety of factors that can clearly be correlated with the global quality of the university in question: "widespread availability of computer resources, global internet literacy, policies promoting democracy and freedom of speech, competition for

international visibility or support of open access initiatives" (Aguillo etal., 2008: 235). Parameters measured include: number of external links, number of sub-domains and number of visits to the website although only four indicators are included in the ranking. Descriptions and weights of the four indicators are provided in Table 2.1 below.

Table 2.1: Indicators of Webometrics World University Ranking

INDICATORS	PERFORMANCE INDICATOR	WEIGHT
Impact/Visibility	External in-links	50%
Presence	Number of (all) web pages from Google	20%
Openness	Number of papers from Google Scholar (2007-11) *pdf, doc, docx,ppt*	15%
Excellence	Number of papers belonging to the top 10% of cited papers from the SCImago database (2003-10)	15%

Source: Andrejs (2013:52)

Data sources for the size of the university's website are taken from Google, Yahoo, Live Search and Exalead. The highest and lowest results are excluded. Numbers of rich files are obtained using Google, since it provides the technical possibility to retrieve the numbers of different kinds of rich files separately. Commercial search engines are used because they already have well-designed and tested robots; frequently update the databases and have automatic tools that can be customized with powerful operators for data extraction (Aguillo et al., 2008: 235). The indicator value for the university is its position in the league table for that particular indicator. The final rank is calculated using the weights provided in Table 2.1. The global league table is arranged according to overall rank. Each university's rank for each of the four indicators is also provided. Besides the main league table, rankings by continent and country are also provided.

Webometrics also carry out rankings of non-university research centres, business schools, hospitals and repositories (Andrejs, 2011: 58).

2.6 World University Ranking Systems

University rankings differ immensely from one another with each ranking system having different weights of measures in determining performance in the rank. The Berlin meeting of the International Ranking Expert Group (IREG. 2006 :4) founded by the UNESCO European Centre for Higher Education in Bucharest and the Institute for Higher Education Policy in Washington DC, established guidelines for university rankings known as the 'Berlin Principles'. Their aim was to support continuous improvement and refinement of the methodologies used to conduct these rankings. The Berlin Principles address the purpose and goals of rankings, the design and weighting of indicators, the collection and processing of data and the presentation of ranking results. The types of ranking include; Shanghai ranking, QS-ranking system, the times higher education, Higher education accreditation council of Taiwan and Webometrics ranking which forms the basis of this study.

2.6.1 The Shanghai Ranking

The Shanghai Ranking (also known as the Academic Ranking of World Universities) was first published in June 2003 by Shanghai Jiao Tong University and is updated on an annual basis. It uses objective indicators to rank over 1,000 world universities and publishes the top 500 online. Universities are ranked by several indicators of academic or research performance, including alumni and staff winning Nobel Prizes and Fields Medals, highly cited researchers, papers published in the journals 'Nature' and 'Science', papers indexed in major citation indices, and the per capita academic performance of an institution. For each indicator, the highest scoring institution is assigned a score of 100, and other institutions are calculated as a percentage of the top score. Scores for each indicator are weighted to produce an overall score for each university

ranked. The indicators for shanghai and weights for shanghai rankings are six, namely: (ARWU, 2013: 3)

- Alumni of an institution winning World Nobel Prizes and Field Medals (10%)

- Staff of an institution winning Nobel prizes and Field Medals (20%)

- Highly cited researchers in 21 broad subject categories (20%)

- Papers Published in Nature and Science (20%)

- Paper Indexed in Science Citation Index-expanded and Social Science Citation Index (20%)

- Per capita academic performance of an institution (10%)

2.6.2 Quacquarelli Symonds (QS) Ranking System

Quacquarelli Symonds(QS) World University Ranking was designed to present a versatile view of the strengths of world's leading universities, thereby confirming that ranking considers the world's elite universities only (QS, 2009: 1). It is therefore hardly surprising that the methodology singles out only around "600 universities altogether and 300 in each of five broad faculty areas" The four areas covered by the indicators are as follows: two indicators – Peer review and Citations per Faculty are used to characterize research. The Employer review is used to characterize graduate employability. The only proxy used to judge the quality of teaching is the much criticized faculty/student ratio. Two proxies are used to characterise the international outlook of universities: the proportion of international staff and the proportion of international students. The indicators are as discussed below, (Andrejs, 2011:26):

Peer review indicator; 'Peer review' in this case is not the expert visit to a university, which is what is understood by 'peer review' in quality assurance procedures. In this case, peer review is

an internet survey in which peers are asked to select up to 30 universities from a pre-selected list. In 2004, when the rankings first appeared, academic peer review accounted for half of the university's possible score. In 2005, its share was cut to 40 per cent because of the introduction of the recruiter review. Faculty student ratio, indicator accounts for 20% of a university's possible score in the rankings. This is a classic measure used in various ranking systems as a surrogate for teaching commitment, but QS has admitted that it is less than satisfactory.

Citations per faculty of published research are among the most widely used inputs to national and global university rankings. The QS World University Rankings used citations data from Thomson (now Thomson Reuters) from 2004 to 2007, and since then uses data from Scopus, part of Elsevier. The total number of citations for a five-year period is divided by the number of academicians in a university to yield the score for this measure, which accounts for 20% of a university's possible score in the Rankings. Issues still linger about the use of citations in ranking systems, especially the fact that the arts and humanities generate comparatively few citations.

Recruiter review is obtained by a similar method to the academic peer review, except that it samples recruiters who hire graduates on a global or significant national scale. The numbers are smaller – 16,875 responses from over 130 countries in the 2011 Rankings – and are used to produce 10% of any university's possible score. International orientation is derived from measures intended to capture internationalism: 5% from the percentage of international students, and another 5% from the percentage of international staff. This is of interest partly because it shows whether a university is putting effort into being global and shows the reputation of the university worldwide.

2.6.3 The Times Higher Education

The Times Higher Education World University Rankings was first published in 2004 which in a way was an 'answer' to the Shanghai ARWU ranking that was first published in 2003.Times higher education chose to co-operate with Thomson Reuters and more recently Elsevier, and created a new ranking system. The publication now comprises the world's overall, subject and reputation rankings, alongside two regional league tables, Asia & Emerging Economies. Times Higher Education World University Rankings is considered as one of the most widely observed university measures (Altbach, 2010:1). It is praised for having a new improved methodology but undermining non-English-instructing institutions and being commercialized are the major criticism.

Times higher education uses five criteria for its rankings, they include (Times Higher Education, 2013:2):

- Teaching: the learning environment (worth 30% of the overall ranking score)

- Research: volume, income and reputation (30%)

- Citations: research influence (30%)

- International outlook: staff, students and research (worth 7.5 per cent).

- Industry income: innovation (2.5%)

Teaching carries a weight of 30%, which is worthy since all global rankings are known to be heavily research biased. The dominant performance indicator (representing 15% of the overall ranking score) used for teaching results from a survey of worldwide experienced scholars' (about 16,600) perception of the prestige of a particular university in teaching. The reputation of these scholars worldwide seems to be mainly through research work and hardly through teaching. In

this case it is clear that these scholars perceive the universities not from the teaching angle but from the research perspectives. To qualify teaching, it requires pedagogical knowledge as well. The other indicators are faculty-student ratio that represents4.5%, which gives simple indication of the quality of teaching; the proportion of doctoral degrees awarded as a proportion of bachelor's degrees and as a proportion of faculty, together counting for 8.25%, but it is questionable whether these are indicators of good teaching and learning; and finally, the institutional income per faculty (2.25%), adjusted for purchasing-power parity, aiming to give an indication of the institution's infrastructure and facilities(Times Higher Education, 2013:2). Research is the second criterion used and it accounts for 30% of the overall ranking score whereby 16,000 scholars perception outweigh the performance indicator (18%) on the university's reputation for research excellence. This means that, the total ranking score of a university is based on the subjective Opinion of scholars and the research dominated perception. The other indicators are the institutional research income per faculty (6%) and the number of papers published in quality, peer-reviewed journals per faculty (6%). Universities that publish less than 200 such papers annually are excluded from the Times higher education Rankings competition, of which this has implications for African universities and many other newly established universities (Mohammed, 2012:7).

The third criterion is Citations, or knowledge transfer that accounts for30%of the total ranking score of a university's publications by scholars. The fourth criterion is International Outlook represented by the proportion of international students (2.5%) and international faculty (2.5%), and the proportion of the university's research journal publications that have at least one international co-author (2.5%).The last criterion weights 2.5% and is based on the proportion of income from industry per faculty that the number of students the university is able to attract.

2.6.4 Higher Education Accreditation Council of Taiwan

The Taiwan Higher Education Accreditation and Evaluation Council Ranking (referred to as HEEACT Ranking) is an annual world university ranking that has been produced since 2007. The HEEACT Ranking evaluates and ranks performance in terms of the publication of scientific papers for the top 500 universities worldwide, using data drawn from the science citation index (SCI). The ranking providers place emphasis on research performance which distinguishes the HEEACT Ranking from the Times higher education Ranking "that focuses on university ranking, and ARWU focusing on academic ranking" (Huang, 2011:37). The ranking has eight indicators in three main categories: Research productivity (20% of the overall weight), Research impact (30%) and Research excellence (50%).

The HEEACT Ranking also takes account of university mergers and specialised university institutes or different campuses in a university system and therefore also includes publications by a given university's affiliated bodies, such as research centres and university hospitals. The selection of universities is based on the number of journal articles and citations. To produce a Top 500 list, 700 institutions are first selected out of the 4000 research institutions listed in Essential Science Indicators (ESI). Institutions that are not universities are then removed, and the remaining institutions are compared with THE, ARWU and US News and World Report ranking lists which results in 725 universities.

The Research productivity category has two indicators, namely: Number of articles published in peer-reviewed academic journals in the past 11 years per staff full time equivalent (FTE) and the number of articles published in the previous year per staff FTE. The overall weight of the productivity category is relatively low at 20%.The Research impact section has three indicators

and its overall weight is 30%, namely: Number of citations in the last 11 years is the total number of citations of the articles of the university in question over the last 11 years, divided by the number of staff FTE; Number of citations in the last 2 years is the total number of citations drawn from SCI per staff FTE; and average number of citations in the last 11 years is the total number of citations of a university over the last 11 years, divided by the total number of publications of the university over the last 11 years.

The Research excellence section has three indicators, which constitute 50% of the final score, namely-index of the last two years, in which the value is the number of articles published by a university in the last two years, which are cited not less than h times. This indicator constitutes 20% of the total score; number of Highly Cited Papers is the absolute number of papers of the university in question that belong to the 1% most cited papers in ESI published in the last eleven years and number of articles in high impact journals published the last year is the absolute number of publications of the university in question published over the last year in one of the top 5%.The distinction of world's university rankings with Webometrics ranking is as shown Table 2.2 pg29.

Table 2.2: Comparison of Ranking Criteria/Indicators used in World UniversityRankings

CRITERIA	ARWU-SHANGHAI JIAO TONG UNIVERSITY,CHINA	QS-QUACQUARELLI SYMONDS,UK	THE-TIMES HIGHER EDUCATION,UK	WEBOMETRICS-CSIC,SPAIN	HEEACT-HIGHER EDU. ACCRED. COUNCIL OF TAIWAN
Teaching Quality and Learning Environment	Alumni Nobel Prizes/Field medals (10%)	Faculty/Student Ratio (20%)	- PhD awards per Academic (6%) -Undergraduate admitted per academic (4.5%) - Income per academic (2.25%) - PhD awards/Bachelor's Awards (2.25%)		
Research Output, Quality and Impact	Nature and Science Publications(20%) Science citation Index/Social Science citation index (20%) Highly cited researchers in 21 broad categories (20%)	Total citation count (20%)	-Research Income (5.25%) - Papers per Academic/Research Staff (4.25%) - Public Research Income/Total Research income .(75%) -Normalized Average Citations per paper (32.5%) -Research Income from Industry per Academic Staff (2.5%)	-Google Scholar (15%) - Rich files –Academ and Publication activities – (15%)	- Number of articles of the last id 1 years (10%) - Number of articles of the current year-(10%) -Number of citations of the last 11 years (10%) -Number of citations of the last 2 years (10%) -Average number of citations of the last 11 years -H-index of the last 2 years (20%) - Number of highly cited papers-15% -Number of articles of the current year in high-impact journals (15%)
Internationalization		% of international students and faculty (10%)	-Ratio of international to Domestic staff – 3%) - Ratio of international to Domestic staff (2%)		
Web Impact/Visibility				-External in–links to website (50%) -Web pages (20%)	
Prestige/peer review	-Faculty Nobel Prizes/Field medals (20%)	-Academic Reputation Index Survey (40%) Employer/Recruiter review Survey (10%)	-Reputational Survey, teaching (15%) -Reputational Survey, research (19.5%)		

Source: University of West Indies office of Planning and Development (2011: 10)

2.7 Webometrics Index and Ranking Process

Sources of data and information for the conduct of rankings include: surveys that allow the receipt of opinions from various stakeholders in order to obtain a set of comparable data on quality and prestige for different institutions, study programmes and/or other activities; available (public domain) data and information collected by government agencies and other various agencies involved in higher education and research; data and information collected by institutions of higher education , which can be of two types—data on governance and management that is usually collected by institutions, and/or data and information exclusively requested and provided to those drawing up the rankings; and bibliometric/scientometric databases, such as those run by Thomson Reuters (ISI Web of Knowledge) and Elsevier (Scopus) which facilitate a multi-disciplinary and research performance assessment (Sadlak, 2011: 4).

The selection of universities in the ranking process depends on the institutional domain, whereby only institutions and research centres with independent web domain are considered. If the institution has more than one main domain, two or more entries are used with the different addresses. About 5-10% of the institutions have no independent web presence, most of them located in developing countries. Institutions include not only universities but also other higher education institutions following the recommendations of UNESCO. Names and addresses are collected from both national and international sources whereby a total of 12,000 Universities are ranked. Top universities are also ranked by the following regions – USA and Canada, Latin America, Europe, Asia, Arab World, Oceania and Africa.

Webometrics uses an "a-priori" scientific model for building the composite indicator. Other rankings choose arbitrary weights for strongly dependent variables and even combine raw values with ratios. None of them follow a logical ratio between activity related and impact related variables, like each group representing 50% of the total weighting. Referring to the individual variables, some of them have values larger than zero for only a few universities and others segregate universities according to differences so small that they are even lower than their error rates. Prior to combination the values should be normalized, but the practice of using percentages is mostly incorrect due to the power law distribution of the data. Webometrics log-normalize the variables before combining according to a ratio 1:1 between activity/presence and visibility/impact groups of indicators. The current composite indicator is now built as follows (Ranking Web of Universities, 2014:1).

2.7.1 Visibility

Visibility Accounts for 50% of the ranking process which bases its outlook on evaluating the content deposited in a webpage. Impact of the quality of the contents is evaluated through a "virtual referendum", counting all the external in links that the institution web domain receives from third parties. Links are used in recognizing the institutional prestige, the academic performance, the value of the information, and the usefulness of the services as introduced in the WebPages according to the criteria of millions of web editors from all over the world. The link visibility data is collected from the two most important providers of this information: Majestic SEO and ahrefs. Both use their own crawlers, generating different databases that should be applied jointly for filling gaps or correcting mistakes. The indicator is the product of square root of the number of back links and the number of domains originating those back links, so the link popularity is not only important, but even the link diversity.

31

2.7.2 Activity

Activity accounts for 50% and it includes the aspect of presence, openness and excellence. Presence covering (1/3) entails the total number of web pages hosted in the main web domain (including all the sub domains and directories) of the institution as indexed by the largest commercial search engine (Google). The search engine counts every webpage, including all the formats recognized individually by Google, both static and dynamic pages and other rich files. The contribution of everyone in the organization is mandatory as the top contenders are already able to publish millions of WebPages. Having additional domains or alternative central ones for foreign languages or marketing purposes penalizes in this indicator and it is also very confusing for external users.

Openness covering (1/3) entails the global effort to set up institutional research repositories that take into account the number of rich files (pdf, doc, docx, ppt) published in dedicated websites according to the academic search engine Google Scholar. The total files total records and those with correctly formed file names are considered (for example, the Adobe Acrobat files should end with the suffix .pdf).

Excellence accounts for (1/3) where the academic papers published in high impact international journals are playing a very important role in the ranking of Universities. Using the total number of papers can be misleading; the indicator is restricted to excellent publications like the university scientific output being part of the 10% cited papers in respective scientific fields. This is a measure of high quality output of research institutions, although the data provider Scimago group supplied non-zero values for more than 5200 universities.

2.8 Webometrics Ranking and Electronic Branding of Institutions

The internet is currently one of the most promising and innovative approaches in education. The World Wide Web has rapidly become global machinery for the propagation of academic findings as well as a very reliable tool for communication among scholars. It has changed the features of major academic disciplines and the way they report their research findings. Effectiveness of internet branding as a marketing tool explains how information can be accessed and disseminated via the Web. Analysis of current usage patterns has indicated that; institutions that adopted internet branding had the competitive edge. Today institutions are competing to brand themselves in several ways to reach and gain a wider variety of students. Prospective students, like prospective customers, have a vast array of choices: private or public school, large or small, domestic or international, liberal arts or technical. Like businesses competing for talented workers, institutions compete vigorously for talented students and calculate ways to improve the conversion rate from accepted to enrolled students (Kim, 2014: 23). Webometrics ranking of Institutions of higher learning can be measured through web related activities, research quality, graduate employability and recognition, teaching commitment, students, resources, quality of management system, program recognition and international commitment.

A website is a communication medium that conveys image. In order to take advantage of the inherent strengths of the website as a two-way communication, websites of Institutions of higher learning must provide content and function that support own brand image. In multi-channel marketing campaigns, sites also need elements like language, imagery, typography and layout to be consistent with both the intent of the positioning and the style of advertisements in other media. Furthermore, the delivery channel should enable action to be followed up. Website branding must supply the content and function that a potential student needs in order to achieve

its goals. For example, potential students looking for an affordable Institution that offers business, technology and arts and design courses need content that must include course fees and a website function that allows them to apply online immediately. Websites also need navigation that makes it easy for users to find the content they need and makes it easy for them to understand the content (Kim, 2014:34).

2.9 Strengths and Criticisms of Webometrics Ranking

2.9.1 Strengths

Webometrics rankings motivate researchers to publish more and better scientific information on the web for use by other people. The system aims at convincing academic and political communities the importance of web publications in disseminating academic knowledge (the contents) and measuring scientific activities, performance and impact. Web ranking reflects performance of an institution as activities of professors and researchers are showed by web presence. Webometrics rankings scan the database of over 15000universities and more than 5000 research centers. Main (global) list includes 4000 top universities of the world, while many more are covered in regional lists. Regional lists help institutions from the developing countries to know their position at regional / national level (Ranking web of universities, 2014:1).

The web covers not only formal (e-journals, repositories) but also informal scholarly communication. Web publications are cheaper, maintaining the high standards of quality of peer review processes. It could also reach much larger potential audiences, offering access to scientific knowledge to researchers and institutions located in developing countries and also to third parties (economic, industrial, political or cultural stakeholders) in own communities. Webometrics ranking has a larger coverage than other similar rankings. It requires that if the web

performance of an institution is below the expected position according to academic excellence, university authorities should reconsider stated web policy, promoting substantial increases of the volume and quality of electronic publications (Ranking web of universities, 2014:3).

2.9.2 Criticisms

Webometrics ranking of world universities is highly dependent on search engines algorithm. The prevalent challenge of using search engines as a tool to measure institute visibility rank is that; it is not known how the search engine operates. The process of knowing the search algorithm and how websites are being indexed or crawled is basically a trade secret. The level of web developer's knowledge also determines the success of web visibility and presence, for instance, a page may not be indexed even though it contains useful information. Poorly written headers, titles or meta-tag (the keywords), incorrect syntax and missing tags are the common problems faced in search engine algorithm of which such neglect can seriously compromise web ranking. Moreover, universities that uses dynamic website–pages that are generated automatically by web server using variables defined by users such as language, geographical location and search terms; may not be indexed well because of heavy use of scripts. Additionally, deceitful use of scripts to create pages can trap crawlers and in turn leads the search engine to conclude that the page is used for spamming (Nissom etal., 2012: 2).

Institutions with larger websites may have low visibility rank than its smaller counterpart due to limited time that crawlers can spend on a particular website. Bigger website means getting smaller visibility and vice versa (Wouters et.al, 2009: 42).The success of ranking algorithm relies on searchers experience. Most searchers always prefer to click the top few results and because of this, search engines generally tuned their algorithm to satisfy this experience –the most popular

35

results will always be at top ranking and least favorite results get less exposure. (Introna etal., 2010 : 14).

Webometrics ranking system is also biased towards country with high income. Based on the observation on the Webometrics ranking table, majority of top 50 universities are from US. Most of these websites receive lots of popular links due to their marketing expenditures and prominence. Most top universities are also originated from country with highest gross domestic product (Rajesh etal., 2008: 7).Even though this ranking system adheres to the Berlin Principle (Webometrics, 2011), web indicator is not always the best indicator. Ranking based on digital criteria sometimes provide false representation of the actual ranking therefore, market acceptance of the programmes provided by that institution should be considered (Rajesh etal., 2008: 7).

Ismail (2008: 11) further denotes that webometrics ranking draws criticism on two counts. First, its traditional linguistic bias as more than half of the internet users are English- speaking people. Second new disciplinary bias since the technology gets more coverage in the web-world as compared to biomedical and some other disciplines. Although webometrics ranking correlates well with quality of education provided and academic prestige, other non-academic variables need to be taken into account. Other criticisms highlighted by University of West Indies Office of Planning and Development (2011:32) include:

- Universities of high academic quality may be ranked lower than expected if they have a restrained web publication policy.
- Measures quantity without sufficient qualitative checks and balances.

2.10 Strategies for Sustainable Webometrics Ranking Performance

Webometrics ranking has special demands (Aguilo, 2008: 2010). Isidro Aguilo head of webometrics laboratory offers the following tips which can be useful among Kenyan institutions for high visibility ranking:

URL naming: Each institution should choose a unique institutional domain that can be used by all the websites of the institution. It is very important to avoid changing the institutional domain as it can generate confusion and has a devastating effect on visibility values. Alternative or mirror domains should be disregarded even when they redirect to the preferred ones. Use of well known acronym is appropriate, but the institution should consider including descriptive words, like the name of the city in the domain name.

Creation of contents: A large website is made possible only with the effort of a large group of authors. The best way to ensure this is to allow a large proportion of staff, researches or graduate students to be potential authors. A distributed system of authoring can operate at several levels:

- Central organization can be responsible for the design guidelines and institutional information.

- Libraries, documentation centres and similar services can be responsible for large databases, including bibliographic ones but also large repositories (thesis, pre-prints and reports).

- Individual persons or teams should maintain their own websites, enriching them with self-archiving practices.

- Hosting external sources can be interesting for third parties and increase visibility: conference website, software repositories, scientific societies and their publications, especially electronic journals.

Conversion of contents: Important resources available in non-electronic formats can be easily converted to web-pages. Most universities have a long record of activities that can be published in historical websites. Other resources include past activities reports or picture collections.

Interlinking: The web is a hyper textual corpus with links connecting pages. Contents of a university website that are not known (bad design, limited information or minority languages) and the size is scarce or of low quality, presume that the site probably will receive few links from other sites. Measuring and classifying the links from other sites can be insightful such as links from partner institutions locally or regionally, web directories from similar organizations, and portal covering similar topics. An institution web page should make an impact using the common language of the communities.

Language: Web audience is truly global and therefore language versions especially in English are mandatory not only for the main pages, but also for selected sections and especially for scientific documents.

Rich and media files: Hypertext markup language is the standard format for web pages, although sometime it is advisable to use rich file formats like adobe acrobat pdf or Microsoft word document, as they allow a better distribution of documents. Postscript is a popular format in certain areas (physics, engineering and mathematics) but it can be difficult to open hence, an alternative version should be provided in pdf. Bandwidth is growing exponentially so it is a good investment to archive all media materials produced in web repositories. Collections of videos, interviews, presentations, animated graphs, and even digital pictures could be very useful in the long term.

Interactive search engine: Institutions web designers should avoid cumbersome navigation menus based on flash, java or JavaScript that can block robot access. Deep nested directories or complex interlinking can block robots too. Databases and even highly dynamic pages can be invisible to some search engines therefore directories or static pages should be used preferably.

Popularity and statistics: Number of visits is important, but it is just as important to monitor origin, distribution and reason for reaching the website (s). Most current log analyzers offer a great diversity of tables and graphs showing relevant demographic and geographic data ensuring there is an option to show referrers-the webpage from which the visitors arrive- or the search term or phrase used if the visit came from a search engine.

Archiving and persistence: Maintaining an old copy of outdated material in the site is mandatory as sometimes relevant information is lost when the webpage is redesigned or updated and there is no easy way to retrieve/ recover the vanished documents.

Standards for enriching sites: The use of meaningful titles and descriptive metatags can increase the visibility of the pages. Standards like Dublin Core can be used to add authoring info, keywords and other data about the web sites.

Supporting open access initiatives and electronic access to scientific publications and other academic material are regarded as crucial strategies towards webometrics ranking. The stated will promote web publication and improve the presence of academic and research institutions on the web hence increasing the visibility of the University. (Stellenbosch University, 2013: 6). University of West Indies office of planning and development (2011: 15) suggests the following strategies that will aid universities to perform highly in the rank and also improve in the quality of research:

Institutions must improve on the; quality and output of research, strive vigorously to enhance quality teaching and learning environment in order to produce high quality graduates who are capable of winning international recognition and develop world class departments in order for institutions of higher learning to maintain position and improve in the world rankings.

Research conducted by scholars should impact on policy formulation, economic development, solutions to problems and challenges. Research capacity should also be expanded and deepened with intensification of focus on selected areas and involving international collaboration in a handful of strategically chosen areas. Interdisciplinary and collaborative scholarship must be improved (increase publications in internationally recognized journals that are included in the ranking's assessment) to aid in research and publication productivity of faculty and Institutes. Focus should be geared on relevant research of high quality by establishing sustainable clusters especially in the sciences and in social sciences as the impact of the output of publications in terms of citations is important in the whole ranking exercise. Fostering an innovative culture and reward excellence in research and innovation within the university system will encourage students to venture in publishing.

Enhancing international reputation of universities through their international connections is another effective strategy that institutions should look at. For instance, an increase of quality foreign students can be instrumental in upgrading the academic level of the student population and enriching the quality of the learning experience through the multicultural dimension especially in the case of graduate students. Additionally, attracting leading scholars from the Diaspora is another internationalization strategy which can be used effectively. Expanding international collaboration and partnerships can be achieved through research collaboration with world class universities in specific areas that can help institutions strengthen competence, build capacity, increase impact and strengthen a collaborative network.

Improving on an institutions visibility, presence and image both regionally and internationally by developing effective marketing and branding strategies that are linked to strategic objectives and rooted in an institutions strengths and forward thinking initiatives will aid in the whole idea of international branding. Research gains need to be highlighted in a strategic and effectively communicated manner whereas teaching and learning highlights need to be emphasized in order for an institutions scholarly output to be visible.

Institutions should further establish a benchmarking system that would include peer institutions and top universities worldwide. Monitoring systems and outcome indicators must be put in place to measure success, create a comprehensive database of research publications in internationally recognized journals which can be easily accessed in one place, create comprehensive database of citations of scholars, benchmark and share data with peer institutions and other top universities and subscribe to publications that provide data on research publications in internationally recognized journals, citations by subject area, papers, authors, universities and countries.

2.11 Empirical and Intellectual Studies

Research by Hazelkorn (2008:196) demonstrates that the new body of comparative information, especially institutional rankings and research output metrics, has rapidly become installed in the performance measurement systems and objectives of both national, government and higher education institution. The outcome of ranking is incorporated into the funding decision of corporations, philanthropists and donors. Hazelkorn points out that almost universally; respondents testified that rankings are a critical factor behind institution reputation, affecting applications especially from international students, university partnerships, government funding and the employer valuation of graduates (Hazelkorn, 2008: 197).

Gunn and Hill (2003:273) further finds out that in early period after the introduction of league table in the united kingdom, the higher the league table position the faster the growth in student application though the effect was mainly felt in newer and lesser status university rather than the better known ones. The association subsequently weakened, but the lesser status institutions remained vulnerable to large swings in student applications. If rankings have larger effects in less well known institutions this draws attention to their potential in the global market for students where they are likely to be more important than in national markets due to heightened information asymmetries. Likewise market research in Australia suggests that global rankings provide an important source of data for potential cross border students, especially in relation to institutions and nations other than the US research sector and the leading British university.

2.12 Knowledge Gap

As evidenced in the empirical and intellectual studies above, the impact of webometrics ranking is of great influence to institutions of higher learning in the country .Studies on the role of webometrics ranking have mostly been conducted in Asia, US and Europe leaving Africa to a doom space. Few known baseline studies have been conducted on webometrics ranking in Africa such as the influence of internalization on the character and behavior of higher education institutions in Nigeria (Okah, 2014: 1), web structure and influence of the Arab universities of the MENA zone (Middle East and North Africa): visualization and analysis (Vagas et.al 2013: 1), study on comparative analysis of factors influencing decision to study abroad (Mpinganjira, 2009:1). This baseline study forms the basis for assessing the impact of Webometrics ranking in institutions of higher learning in Kenya; and showcase whether performance indicators of web ranking favour or side-line institutions.

2.13 Conceptual Framework

Conceptual model to be used for the study helped in showing the relationships between the variables, which the study identified as being of importance to the research problem. Developing such a conceptual framework helped to suggest and test certain relationships thus improving the understanding of the dynamics of the situation. The conceptual framework as illustrated in Figure 2.1 pg 45 was based on the independent variable (Quality of education and research) and dependent variables (performance indicators of webometrics ranking, possible implications of web ranking to institutions, training and awareness of web ranking and sustainability strategies on web ranking performance).

Independent Variable	Dependent Variables	Outcome Variables
Quality of Education and Research	• Indicators of Webometrics Ranking. • Implications of web Ranking in Institutions. • Training and Awareness on Web Ranking. • Sustainability Strategies on Web Ranking Performance.	Webometrics Ranking Index; • Visibility • Openness • Excellence • Presence
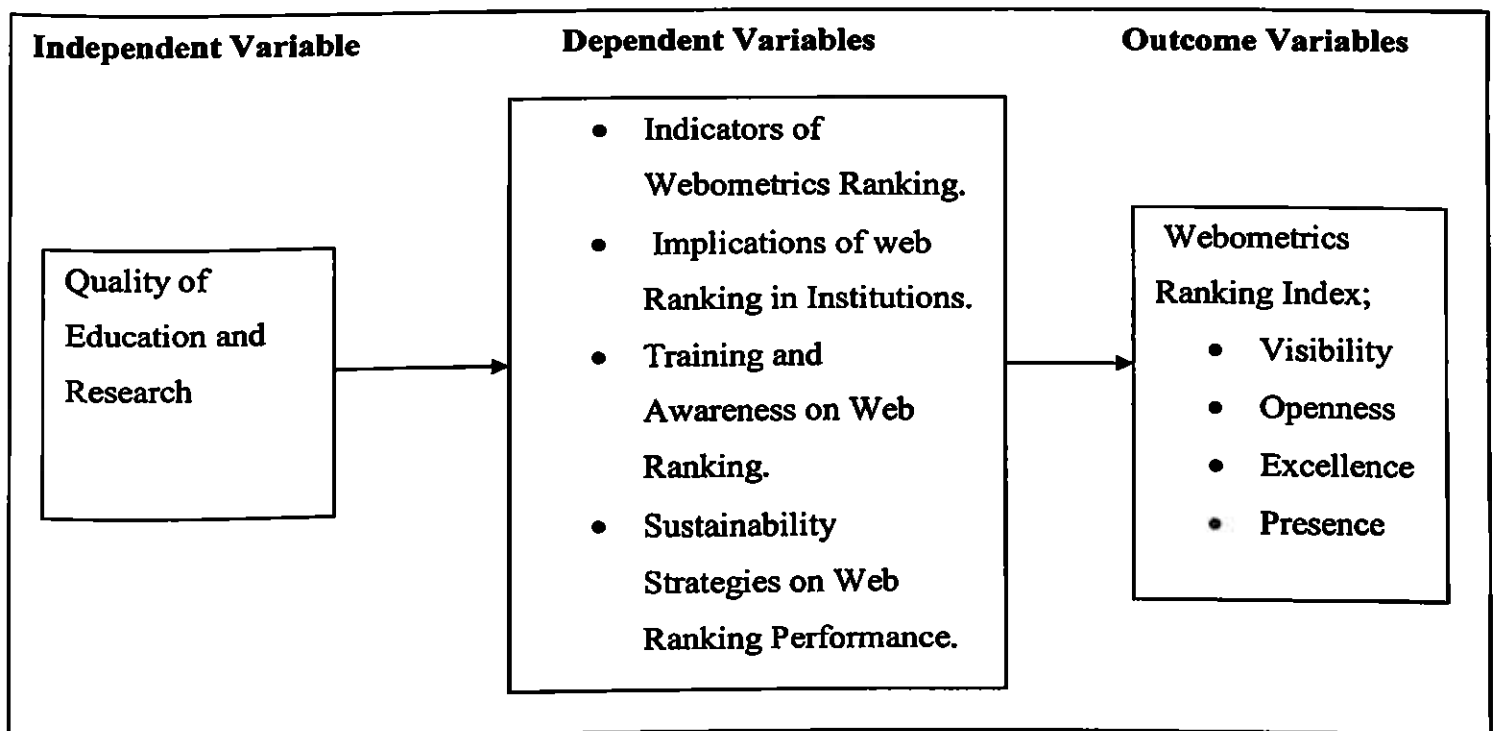
Figure 2.1: Conceptual Framework (Researcher, 2015)

Working on the dependent variables such as by improving performance indicators that are used in Webometrics ranking such as increase research publications, improving visibility through use of institutional repository and availing range of disciplines of study will uplift an institutions performance in the web rank. Additionally, training and awareness on the need and importance of web ranking and how to achieve high score and maintaining high performance will aid in sustaining an institutions ability to excel in all its aspects regarding to web ranking.

2.14 Chapter Summary

This chapter has discussed Webometrics ranking in its totality. It began by discussing the development of Webometrics, Global status of webometrics in higher education, webometrics ranking in Kenyan institutions of higher learning, webometrics ranking and quality of research and education, performance indicators used in webometrics ranking, ranking process, Strength and criticisms of webometrics ranking, strategies to enhance webometrics ranking performance, detailed the empirical and intellectual basis of the study, discussed the knowledge gap and wrapped up by discussing the conceptual framework.

CHAPTER THREE
RESEARCH METHODOLOGY

3.0 Introduction

This chapter specifically looks at research design, area under study, target population, sample size and sampling techniques, data collection methods, research instruments, procedures to be used in data analysis and ethical considerations.

3.1 Research Design

Research design entails choosing subjects to participate in the study and the techniques, approaches and procedures for collecting data from the subjects. Descriptive survey of the University of Nairobi was used to collect data on webometrics ranking indicators and how it has enabled the select university in both to be placed high in the latest Webometrics ranking. Descriptive survey provides a snapshot of the population at the certain time allowing conclusions to be drawn about phenomena across a wide population (Shuttleworth, 2010: 1). Qualitative and quantitative research designs will also be used in the study so as to explore and understand people's beliefs, experiences, attitudes, behavior and interactions (qualitative) and to give systematic empirical investigation of social phenomena via statistical, mathematical or numerical data or computational techniques (quantitative). The advantage of combining both qualitative and quantitative methods include: Research development, increased validity, complementary information and creating new lines of thinking by the emergence of fresh perspectives and contradictions (Flick, 2009: 27).

3.2 Area of Study

The study was conducted at the University of Nairobi main campus due to the exemplary performance of the university as rated by webometrics ranking of 2015. In addition the

university is also the public leading University in Kenya with campuses spread all over Kenya, has diverse academic programs, receives funds from government agencies to support its initiatives and large and resourceful library with internet connectivity within the library and environs in each campus to support learning activities.

3.3 Target Population

Population is any group of individuals who have one or more characteristics in common that are of interest to the researcher. The target population of this study comprised of respondents from the universities staff and students of the select university. The staff included the universities information and communication technology department, web champions and electronic resources librarian. Postgraduates' students from the select university were chosen to give views and opinions on webometrics ranking. University of Nairobi postgraduate's students from the department of library and information science were selected to participate in the study as they are knowledgeable about webometrics ranking.

3.4 Sample and Sampling Techniques

3.4.1 Sample Size

Sample size entails the number of participants chosen from the whole population to participate in a research or study (Ngoako, 2011:10). Purposive sampling was used in the study so as to focus on particular characteristics of a population that are of interest. The primary consideration in purposive sampling is to draw on who can provide the best information to achieve the objectives of the study (Kumar, 2005:179). This method was ideal for the study because of the small size of the target population and therefore enabled the study to get in-depth information rather than generalized broad understanding of the research questions. The sample size for the research was based on the total membership of staff of information and communication technology, digital

content, electronic resources, and web champions as they deal with tasks geared towards webometrics ranking. Postgraduate students of Library and information science were chosen purposively as a representative of the student population as they are familiar with webometrics ranking practices. Stratified purposive sampling technique was adopted to illustrate characteristics of particular subgroups of interest and facilitate comparisons in order to get information from the various strata's. Questionnaires were administered to all staff and students in the targeted sections as tabulated from the university of Nairobi student and staff records in the areas identified in the study. In summary, the sample size involved in the study is as shown in Table 3.1 below.

Table 3.1: Sample Size

NO.	RESPONDENTS	POPULATION SIZE	SAMPLE SIZE
1	Web champions	15	15
2	ICT Staff	20	20
3	Digital content staff	30	30
4	E-resources staff	05	05
5.	Postgraduate students	30	30
TOTAL		100	100

Source: (Researcher own tabulation from Uon Records, 2015)

3.4.2 Sampling Techniques

Sampling is the procedure a researcher uses to gather people, places or things to study. It is a process of selecting a number of individuals or objects from a population such that the selected group contains elements representative of the characteristics found in the entire group (Mikkelsen, 2009 : 72). The population was stratified into five homogenous groups which are

Web champions, Information communication and technology staff, Digital content staff, electronic resources staff and postgraduate students. This method was used to reduce the degree of error in the sample and getting a more representative sample of the population (Babbie, 2010: 102). The population was grouped into these categories hence forming five groups each having homogenous characteristics. The researcher administered questionnaires to all the respondents in the sample size as they were purposively selected for the study to enable the researcher acquire in-depth information on the research topic. The stated being the cases, all the respondents in the sample size were eligible to take part in the study.

3.5. Data Collection Methods

Data collection is the process of gathering and measuring information related to study variables in an established and systematic fashion that helps in answering research questions, aid in testing hypotheses and evaluating outcomes (Konar, 2009: 47).The research tools designed to aid in the study are for the purpose of suiting the study population and meeting the set objectives. The study employed the use of questionnaires and document reviews to gain data and information on the study as discussed. Table 3.2 illustrates how data will be collected using the specified methods.

3.5.1 Questionnaires

To ensure that appropriate information for the study was captured, two different questionnaires were developed, one for administrative staff and another one for students. Each of the questionnaires had brief instructions on how the respondents were to respond to the questions. The questionnaire was divided into two sections, the first sought to gather demographic

information of the respondents and the other sections aided in responding to the research questions of the study. The Questionnaires were self-administered to the respondents so as to collect information relevant to the study. Open ended and closed ended questions were used for both staff and students. Questionnaires were preferred for this study because they produced quick results and were completed at the respondents 'convenience.

3.5.2 Document Reviews

Document reviews is a form of qualitative research in which documents are interpreted by the researcher to give voice and meaning around an assessment topic (Mikkelsen, 2009: 33). The Study incorporated the use of internet tools such as Google scholar, Yahoo, databases and scholarly peer-reviewed journals as the nature of the study requires the researcher to carry out document analysis of literature and content written on webometrics and compare with the current trends in terms of performance of universities worldwide in order to give a global view on the research topic.

3.6 Research Instruments

3.6.1 Pilot Study

The researcher carried out a pilot study at College of Health and Veterinary Sciences Upper Kabete to pretest the validity and reliability of data collected using the questionnaire. The researcher selected a pilot group of 5 individuals from a different group rather than the target sample to test the validity and reliability of the research instrument. The pilot study was allowed for pre-testing of the research instrument. The testing included variables, methods, language, content and technique of the study instruments. The pilot study enabled the correction of inconsistencies arising from the instruments, which ensured that they measured what was intended.

3.6.2 Validity

Validity of the study was tested through administering the questionnaires to a small group of respondents who do not form part of the study to help validate the information collected. The questionnaire was keenly crafted to ensure that it covers all research objectives in order to address all underlying issues under investigation. The researcher also deliberately sought evidence from the literature information on Webometrics ranking in relation to quality of education and research. Through this, comparisons were made with statements of respondents in the current study. The researcher also compared responses from the staff and students in drawing conclusions about the study. Information from secondary sources like books, journal articles and related research findings were used in interpreting the findings.

3.6.3 Reliability

The reliability of the tools of data collection was conducted during the pilot study to determine whether the results produced are reproducible and consistent. This helped to determine whether the questionnaire was capable of yielding similar results even when administered to same people but in different occasions. Moreover, a different set of respondents were chosen and administered the same questionnaire but in different occasions to determine whether the answers are consistent.

3.7 Data Collection Procedures

The researcher collected primary data for the purpose of assessing webometrics ranking in relation to quality of education and research in institutions of higher learning in Kenya. Primary data was collected using questionnaires. The questionnaire designed in this study comprised of two sections. The first part determined fundamental issues including the demographic

characteristics of the respondent, while the second part consisted of questions where the variables of the study were focused on. Questionnaire were designed in line with the objectives of the study and structured questions were used in an effort to conserve time and money as well as to facilitate an easier analysis as they are in immediate usable form; while the unstructured questions were used so as to encourage the respondents to give an in-depth and felt response without feeling held back in revealing of any information.

3.8 Data Analysis

Descriptive statistics was used to analyze the data. Tables of frequency distribution were used to show different patterns of data categories. The frequencies were then translated into percentages since percentages are extremely important especially if there is a need to compare groups that differ in size. After data collection, the data was edited to check for completeness, accuracy and uniformity and subjected to series of manual checks for cleaning purposes. The data was then coded using excel computer code sheets to aid in computer data entry while Statistical Package for Social Sciences (SPSS) was used to manage, analyze and display data keenly addressing the aim, objectives and research questions of the study. This software aided in faster data analysis since items such as graphs, pie charts were generated automatically given information on the variables. Statistics and data (STATA) was used in calculating arithmetic mean and standard deviation.

Qualitative data was analyzed through checking out the patterns/themes that emerge and comparisons and variables drawn from the collected data. The analysis was close to raw data, which was in the words of the respondents and context based. In this case, qualitative data was quantified by converting into numerical codes and the n using statistical analysis with the data. This typically involved some form of counting or numerical representation whereby words and

themes were converted into numbers and percentages and frequencies of each response calculated.

3.9Ethical Considerations

A letter of introduction and authorization from the University was provided as a request for permission to conduct the study. Respondents participated in the research activity out of their own will and no bribery and coercion was done. The study also protected the respondent's confidentiality by not capturing names and other means of personal identification. Intellectual honesty was ensured and no any forms of plagiarism were practiced by the researcher. Moreover, the purpose of the study was fully explained to the respondents prior to the actual data collection.

3.10 Chapter Summary

The chapter described the research methodology of the study, explained the sample selection, described the procedures used in designing the instrument and collecting the data, and provided an explanation of the statistical procedures used to analyze the data. The chapter also sought the validity and reliability of the study. The area of pilot study was indicated, ethical issues were considered, confidentiality of information adhered to and data analysis and presentation in relation to research questions and objectives stated

CHAPTER FOUR
DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.0 Introduction

This chapter outlines the data presentation, data analysis, results and discussions of the study as per the objectives. The study used questionnaires and document reviews to obtain data and information. The study used Likert scale in collecting and analyzing the data whereby the scale of 5 points was used in computing the means and standard deviations. The results were then presented in frequencies tables, graphs and charts as appropriate with explanations being given in prose.

4.1 Response Rate of Respondents

The study targeted a total population of 100 respondents of whom 30 were students and 70 staff members in the designated categories. From the total population, the study used 100 respondents of which 77 questionnaires were responded to and returned. 23 questionnaires that remained were not responded to by the respondents. The overall response rate was 77% which was adequate for analysis. The response rate is demonstrated in Table 4.1 below.

Table 4.1 Response Rate of Respondents

RESPONDENTS	DISTRIBUTED	RETURNED	PERCENT
Staff	70	54	77.14
Students	30	23	76.67
TOTAL	100	77	77.00

4.2 Background Information of Respondents

The study sought to inquire information on various aspects of the respondents' background, in terms of age, gender and academic qualifications. The focus on demographic characteristics is to provide a basis for a clear understanding of the respondents included in the study and analysis of other results that shall follow based on the research objectives. This information therefore, aimed at testing the appropriateness of the respondent in answering the questions regarding webometrics ranking in relation to quality of education in Kenya.

4.2.1 Gender Distribution

Majority of the respondents in the study were female. From the total number of respondents, male respondents were 38% while female respondents were 62%. This illustrates that most of the respondents who participate in Webometrics related activities at the University of Nairobi are female as shown in Figure 4.1 below.
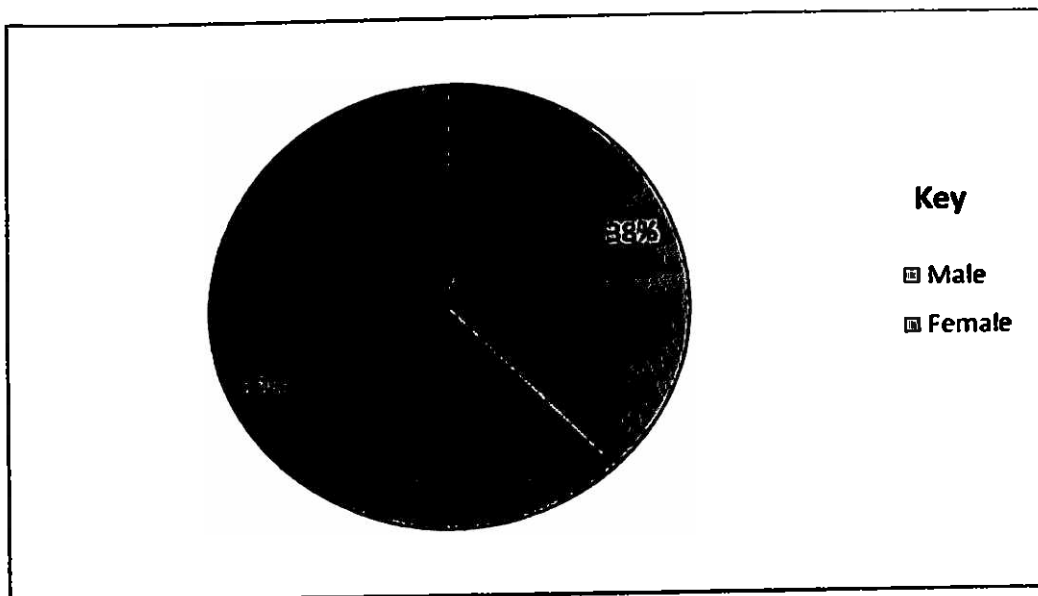
Figure 4.1: Gender Distribution

4.2.2 Highest Educational Level

The findings indicated that 1% of the respondents were certificate holders, 18% diploma holders, 37% degree holders, 42% masters holders and 2% PhD holders. From this statistics, it is clear that webometrics ranking strategies and measures can be upheld to enhance visibility of the institution as a high level of understanding is envisioned with a high level of sustaining performance in webometrics ranking of universities. The findings are as shown in Table 4.2 below.

Table 4.2: Educational Qualifications

RESPONDENTS	FREQUENCY	PERCENT	CUMULATIVE PERCENTAGE
Certificate Level	1	1.32	1.32
Diploma Level	14	18.42	19.74
Degree Level	28	36.84	56.58
Masters Level	32	42.11	98.69
PhD	2	2.63	100
TOTAL	77	100	

4.2.3 Age of the Respondents

Age is a very important demographic factor because it affects the way one accesses and even uses information in any form oral, print or electronic. The study found that most of the respondents were of older age and were therefore better placed to provide vital information regarding the study. The analysis found that those of below 25 years were 6% those of the age between 26-35 years were 57%, those of the age between 36-45 were 16%, and those of the age between 46-55 years were 16%, those aged between 56-65 years were aged between 4% same as those aged between 66-70 years were 7% as shown in Figure 4.2 pg 56.
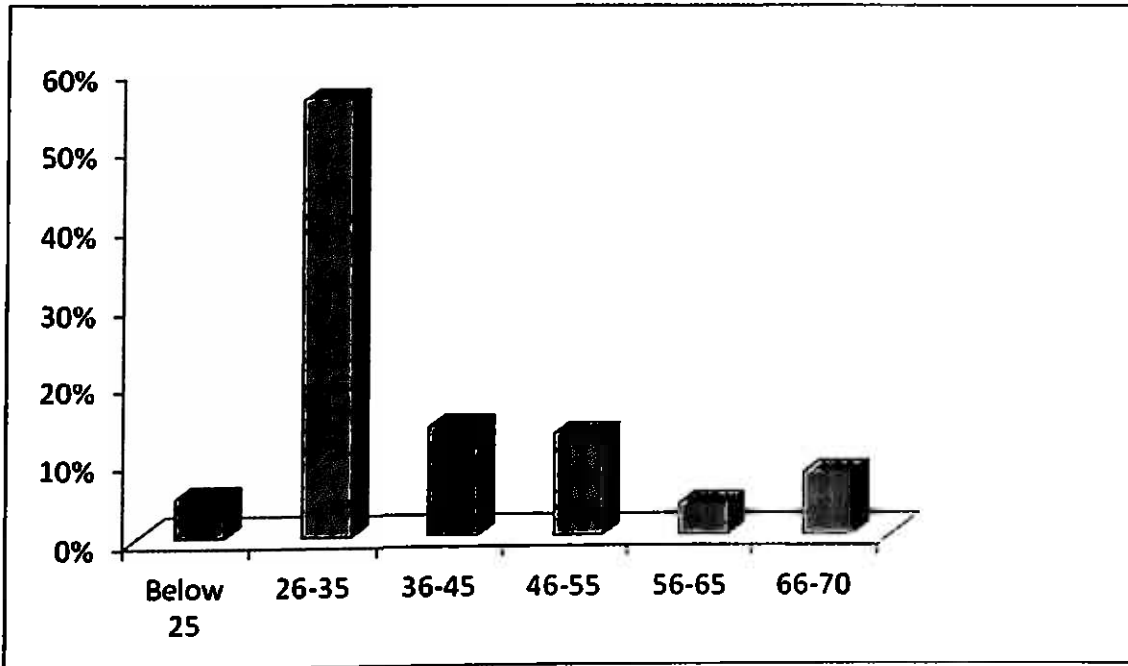
Figure 4.2: Age of Respondents

4.3 Webometrics Ranking and Quality of Research and Education

The respondents were asked to indicate the extent to which various benefits of webometrics ranking relate to quality of research and education. The purpose of this question was to find out the role of webometrics ranking in support of research and quality of education in Kenya. The results imply to a great extent that webometrics ranking increases visibility of an institution to the general public (mean = 4.70), supports research work (mean =4.62), enhances competition among institutions (mean= 4.44) and increases student enrollment (mean = 4.02). Respondents further implied that webometrics ranking enhances collaborations among other institutions (mean =3.94) and increases donor funding to an institution (mean= 3.66). The findings are as tabulated in Table 4.3 pg 57.

Table 4.3: Benefits of Webometrics Ranking

BENEFITS	MEAN	STANDARD DEVIATION
Supports research work	4.62	0.65
Enhances competition among institutions	4.44	0.75
Enhances collaborations with other institutions	3.94	1.09
Increases donor funding to an institution	3.66	1.01
Increases student enrollment	4.02	0.99
Increases visibility of an institution	4.70	0.73

In regard to webometrics ranking and how it relates to quality of education and research, the study sought to find out the nature of website that would lead students to accessing specific website, and inquire from the staff the design of websites in the university. The findings in Table 4.4 pg58reveal that, to a great extent that websites that are user friendly (mean=4.47) and have appropriate content (mean = 4.22) attracts more users to access the websites. Respondents further noted that, websites that have navigation routes (mean= 3.90), have options to save documents through email or social network (mean=3.69), loads pages faster (mean=3.65) and have multiple language selection (mean = 2.78) will moderately affect the level of access by users.

Table 4.4: Website and Access of Journals

WEBSITE DESIGN	MEAN	STANDARD DEVIATION
User friendly	4.47	0.770
Navigation routes	3.90	0.852
Loads pages faster	3.65	1.085
Multiple language selection	2.78	1.354
Options to save document via e-mail/ social network	3.69	1.228
Appropriate content	4.22	0.837

4.4 Perceptions of Webometrics Ranking Process

The study also sought to find out the perception of the respondents toward webometrics ranking process. The findings reveal that out of the 54 staff 40 are satisfied with the process, 11 are not satisfied and 3 had no opinion. 16 postgraduate students are satisfied with the process, 5 are not satisfied and 2 had no opinion. In summary, the findings are as tabulated in Table 4.5 below.

Table 4.5: Respondents Perceptions on Webometrics Ranking Process

RESPONDENTS	SATISFACTORY	NOT SATISFACTORY	NO OPINION	TOTAL
Staff	40	11	3	54
Students	16	5	2	23
TOTAL	56	16	5	77

4. 5 Strategies on Sustaining Web Ranking Performance

4.5.1 Awareness of Webometrics Ranking

To find out whether the respondents were aware about webometrics ranking, the study inquired through asking the respondents to indicate how they learnt about webometrics ranking. Awareness is crucial in finding out appropriate measures to be put in place. The study indicated that majority of the respondents learnt about webometrics ranking through the internet (36.62%), library website (31.16%) and lecturer (11.68%) while few of the respondents learnt through university mandate (9.08%), colleague (7.76%) and media (4.29%) as portrayed in Table 4.6 below. This meant that the Library Department does a lot of marketing and awareness on webometrics ranking.

Table 4.6: Source of Knowledge onWebometrics Ranking

SOURCE	FREQUENCY	PERCENT	VALID PERCENT
Colleague/friend	6	7.76	7.76
Lecturer	9	11.68	11.68
Library Website	24	31.16	31.16
Internet	28	36.62	36.62
Media	3	4.29	4.29
University Mandate	7	9.08	9.08
TOTAL	77	100	100

4.5.2 Information and Skills on Web Ranking

The study also sought to find out how the staff gained skills and information on webometrics ranking other than just knowing about the study established that majority of the respondents learnt through gained information and skills on webometrics ranking through Formal training in

the library (44.44%) and informally (22.22%), while few of the respondents gained skills and information through seminars and workshops organized by the library (18.52%) and self instruction (14.81%). The study therefore, implies that the library is keen on imparting skills and information to staff in support of webometrics ranking of the university. The findings are as tabulated in Table 4.7below.

Table 4.7: Source of Information and Skills on Web Ranking

SOURCE	FREQUENCY	PERCENT	VALID PERCENT
Formal Training in the Library	24	44.44	44.44
Seminars and Workshops Organized by the Library	10	18.52	18.52
Informally	12	22.22	22.22
Self Instruction	8	14.81	14.81
TOTAL	**54**	**100**	**100**

4.5.3 Training in Access of Electronic Resources

The students were asked to rate the level of training in relation to use and access of electronic resources in the university. This was conducted to find out the level of training of students in a bid to accessing electronic journals and resources which is crucial in webometrics ranking. Most respondents noted a very high level of training in terms of use and access of electronic resources (52.17%) probably due to the training that is normally conducted to all the new students at the graduate research laboratory or the electronic resources sections. 5 respondents cited a high level of training (21.74%) while few of the respondents noted moderate level of training (17.39%) and low level of training (1%). This is illustrated in Table 4.8pg 61.

Table 4.8: Level of Student Training in Access of Electronic Resource

LEVEL	FREQUENCY	PERCENT	VALID PERCENT
Very High Level of Training	12	52.17	52.17
Low level of Training	1	4.34	4.34
Highly Trained	5	21.74	21.74
Moderately Trained	4	17.39	17.39
TOTAL	**23**	**100.00**	**100**

4.5.4 Possible Sustainability Strategies on Web Ranking Perfomance

The study also sought to find out the possible strategy that can be put in place to aid in the ranking process. The findings in Table 4.9 pg 62 revealed that most respondents advocated for training on webometrics ranking process (20%) and uploading of research materials (15%). Moderate suggestions included, enriching of repositories (12%), increasing awareness (9%), increase of funds, avoid bias, improving technology at (8%) and embracing local ranking measures at (7%). Least suggested solutions included; improving accessibility (5%), Harmonization (4%) and modern facilities (3%).

Table 4.9: Strategies for Promoting Web Ranking Process

STRATEGY	FREQUENCY	PERCENT	CUMULATIVE PERCENT
Embrace Local Ranking Measures	5	7	6.67
Training	14	20	25.97
Uploading of Research Materials	11	15	37.33
Increase Awareness	7	9	46.67
Enrich Repositories Content	9	12	58.67
Increase Funds	6	8	66.67
Harmonization	3	4	70.67
Modern Facilities	2	3	74.67
Avoid Bias	6	8	82.67
Improve Accessibility	4	5	88
Improve Technology	6	8	100

The study further sought to find out the strategy that led to the high latest webometrics ranking at the university. The staff were the main respondents in this area as they are keen on development of the systems in place and implementation of the processes. The researcher noted that at the same level all the strategies listed by the researcher (open access policy, electronic access to scientific publications, scholarly research and publications, marketing and branding strategies, collaborations and partnerships and benchmarking system contributed to the latest webometrics ranking by the university meaning it was a mixture of all the factors stated by the researcher. The findings are as tabulated in Table 4.10 pg 63.

Table 4.10: Strategies for High Web Ranking Performance

STRATEGY	MEAN	STANDARD DEVIATION
Open Access Policy	1.15	0.408
Electronic Access to Scientific Publications	1.18	0.438
Scholarly Research and publications	1.07	0.264
Marketing and Branding Strategies	1.46	0.636
Collaboration and Partnerships	1.56	0.607
Benchmarking System	1.48	0.574

The students on the other hand were asked to indicate the extent to which the strategies for sustaining web ranking performance will be effective to any institution of higher using a likert scale. The findings reveal that to a great extent students supported creation of user friendly websites (mean= 4.52), marketing and awareness (mean=4.39), enrichment of institutional repositories (mean=4.35), publishing (mean=4.30) and archiving of content (mean=4.04). Optional use of multiple languages in the websites was moderately supported (mean=3.56). Summary of the findings are as illustrated in Table 4.11 below.

Table 4.11: Strategy for Sustaining Performance on Webometrics Ranking of Universities

STRATEGY	MEAN	STANDARD DEVIATION
Archiving of Content	4.04	0.928
Publishing	4.30	0.635
Creation of User Friendly Websites	4.52	0.665
Enrichment of Institutional Repositories	4.35	0.775
Marketing and Awareness	4.39	0.656
Optional Use of Multiple Languages	3.56	1. 12

4.5.5 Management Support

The staff were further asked about the university management support in webometrics ranking in terms of provision of facilities and services. The study revealed that the university management supported the process of webometrics ranking through the provision of funding (mean=2.63), Education and training of staff (mean= 2.20), Promotion and marketing strategies (mean= 2.19) and adequate computer hardware (mean=2.02). This implies that the university balances its role in support of the listed services without giving prominence or demeaning other services and provision facilities the most concentrated factor being provision of funds. The results are tabulated in Table 4.12 below.

Table 4.12: Facilities and Services Rendered by Management

FACILITIES AND SERVICES	MEAN	STANDARD DEVIATION
Adequate Computer Hardware	2.02	0.858
Education and Training of Staff	2.20	0.737
Promotion & Marketing Strategies	2.19	0.848
Funding	2.63	0.875

4.6 Challenges of Webometrics Ranking Process

The respondents were asked to respond to various institutional challenges that affect webometrics ranking performance by indicating yes or no to the listed challenge. The findings note that to a great extent absence of digital repositories (mean=1.91) and inadequate information communication technology (mean=1.86) are the major challenges that affect webometrics ranking practices in institutions of higher learning. To a moderate level courses/programs offered (mean=1.74) and few/no scholarly publications affect institutions position in the rank and lack of knowledge and skills was the least cited challenge in institutions which meant that institutions are knowledgeable on webometrics ranking strategies and measures. The summary of the findings are illustrated in Table 4.13 pg. 65.

64

Table 4.13: Challenges of Webometrics Ranking Process

RISKS	MEAN	STANDARD DEVIATION
Inadequate Information Communication Technology	1.86	0.388
Few/no Scholarly Publications	1.66	0.503
Courses/Programs Offered	1.74	0.497
Absence of Digital Repositories	1.91	0.369
Inadequate Funds	1.27	0.448
Lack of Knowledge and Skills	1.52	0.528

The respondents were further asked to provide possible solutions to the challenges that affect institutions of higher learning in regard to webometrics ranking. Majority of the respondents noted that funding and training (16.88%), sensitization and uploading publications (15.58%) and provision of modern systems and technology as possible solutions in improving institutions performance in the rank. Few of the respondents noted that enhancing information literacy skill (9.09%), Re-visiting teaching mode and organizing seminars and workshops (5.19%) while (3.9%) advocated for consortia as means of solving the institutional challenges. The findings are illustrated in Table 4.14 pg 66.

Table 4.14: Possible Solutions to Institutional Challenges

SOLUTIONS	FREQUENCY	PERCENT	CUMULATIVE PERCENT
Upload publications	12	15.58	15.58
Funding	13	16.88	32.47
Sensitization	12	15.58	48.05
Training	13	16.88	64.94
Provision of Modern Systems and Technology	9	11.69	76.62
Re-visit Teaching Mode	4	5.19	81.82
Enhance Information Literacy Skills	7	9.09	90.91
Organize Seminars and Workshops	4	5.19	96.1
Consortia	3	3.9	100
TOTAL	77	100	

4.7 Chapter Summary

This chapter has presented and analyzed data collected from the study. The findings are further discussed in relation to the objectives of the study. This information is used to discuss the findings and inform the summary, conclusion and recommendations that are presented in the next chapter.

CHAPTER FIVE
SUMMARY OF THE FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter gives an overview of the findings, conclusions and recommendations made from the study. These are based on objectives and research questions of the study. The aim of the study was tofind out the relationship between webometrics ranking and the quality of education and research in Kenya with reference to the University of Nairobi.

Objectives of the study were to:

1. Find out how webometrics ranking promotes quality of research and education in academic institutions in Kenya.

2. Assess the perceptions of staff and students on webometrics ranking in institutions of higher learning in Kenya.

3. Examine the strategies used by the select academic institution to be rated highly in webometrics ranking of universities.

4. Establish challenges faced in relation to webometrics ranking of universities in institutions of higher learning in Kenya.

5. Suggest framework of strategies for high webometrics ranking in institutions of higher learning in Kenya.

5.1 Summary of the Findings

Study findings are summarized as follows:

5.1.1 Demographic Information of the Respondent

The study generated general information on respondent's gender, highest education level and age. This was necessary to validate the responses which helped the researcher to understand from which level of experience the respondents answered questions. Results indicated that majority of the respondents in the study were female as shown in Figure 4.1 pg 54. Age of the respondents determined the inclination to disseminate webometrics ranking strategies to maintain high performance of the university in the rank as majority of the respondents were in the age range between 26-35, 36-55 and 46-55as indicated in Figure 4.2pg 56.

This assumes that the higher the advancement in age as well as professional growth and development, the higher the contribution to the implementation of sustainable practices in webometrics ranking process. Level of education was important in getting the views and opinions of the students and staff towards webometrics ranking process, challenges and possible solutions in sustaining the performance of the university. The findings in Table 4.2 pg 55 revealed that most respondents were masters and degree holders hence confirmed the assumption that students and staff in higher levels of education contribute immensely in research activities, publishing, access of journals and electronic resources which raise the performance of the institution in web ranking of universities.

68

5.1.2 Webometrics Ranking and Quality of Research and Education

The first objective of the study was to find out how webometrics ranking promotes quality of research and education in academic institutions in Kenya. The study findings revealed that webometrics ranking to a great extent increases visibility of an institution to the general public hence showcasing institution output promoting research activities in the university and enriching knowledge hence enhancing quality of education as a whole, supports research work, enhances competition among institutions and increases student enrollment which implies that the higher an institution rank the more student enrollment as shown in Table 4.3 pg 57.Respondents further implied that webometrics ranking enhances collaborations among other institutions and increases donor funding to an institution to a slightly lower percent which meant that all the benefits discussed in the study are crucial in webometrics ranking as a tool in promoting quality research and education in Kenya.

The findings of the study thereby support sentiments discussed in the literature review whereby it is evident that webometrics ranking supports research work and quality of education as it provides the public with information on the standing of higher education institutions, foster's competition among higher education institutions; provides additional evidence about performance of particular higher education institutions and/or study programmes; stimulates the evolution of centres of excellence; and provides additional rationale for allocation of funds as suggested by Sadlak (2011:3), Consequently, the Institution of Higher Education Policy (IHEP) study, notes that rankings foster collaboration, such as research partnerships, student and faculty exchange programmes, and alliances that can be important starting points to identify institutions with which to collaborate and partner (IHEP, 2009:2).

The study also looked at the nature of website that would lead students to accessing specific website and to inquire from the staff the design of websites in the university. The internet has been termed as one of the most promising and innovative approaches in education and a useful strategy in web ranking as the more a website is accessed the higher the chance of high ranking, hence the nature of website plays a key role in support of webometrics ranking performance as argued by Kim (2014: 23). The findings revealed that the university websites to a great extent is user friendly and has appropriate content as shown in Table 4.4 pg 58, which attracts users to access the websites which probably is the reason why the university was ranked highly in Kenya.

5.1.3 Perceptions on Webometrics Ranking Process

The Second objective of the study was to assess the perceptions of staff and students on webometrics ranking in institutions of higher learning in Kenya. Ismail (2008: 11) noted that webometrics ranking draws criticism in terms of the linguistic bias, new disciplinary bias since technology gets more coverage in the worldwide web as compared to biomedical and other disciplines. University of West Indies Office of Planning and Development (2011:32) on the other hand noted restrained web publication policy and insufficient quantitative checks and balances as hindrance to web ranking performance of institutions in the rank. The findings however reveal that high numbers of staff are satisfied with the process of webometrics ranking unlike students as shown in Table 4.5 pg 58.

5.1.4 Sustainability Strategies on Web Ranking Performance

The third objective of the study was to examine the strategies used by the selected academic institution to be rated highly in webometrics ranking of universities. The study also revealed that respondents learnt about webometrics ranking through the internet, library website and lecturer as portrayed in Table 4.6 pg 59. This supports Aguillo etal., (2008: 235) who notes that web

presence is used as a measure of activity and visibility of an institution in the web that can clearly be correlated with the global quality of the university in question. The study also revealed that staff gained skills and information on webometrics ranking through formal training in the library as tabulated in Table 4.7 pg 60.The students rated the level of training in relation to use and access of electronic resources in the university as very high as illustrated in Table 4.8 pg 61. Training on access and use of electronic resources has been noted by Aguillo etal., (2008:235) as possible strategies on achieving high Webometrics ranking and it's evident that the more time spent on the internet by the users the more chances of high ranking as the hits to a webpage add up as a measure of webometrics ranking. Scholars should also be encouraged to cite articles of articles published in their institutions to enhance visibility of publications in the institution.

On possible strategies that can be put in place to aid in the ranking process, most respondents advocated for training on webometrics ranking strategies and uploading of research materials which are crucial factors in webometrics ranking process as indicated in Table 4.9pg 62. In addition, open access policy, electronic access to scientific publications, scholarly research and publications, marketing and branding strategies, collaborations and partnerships and benchmarking contributed to the latest high webometrics ranking by the university as shown in Table 4.10 pg. 63. This supports the strategies mentioned by Stellenbosch University, (2013: 6) in the literature review that aid in enhancing high performance in the rank. The findings further reveal that creation of user friendly websites, marketing and awareness, enrichment of institutional repositories, publishing and archiving of content will lead the university to sustaining its performance in the rank as noted by the students as shown in Table 4.11 in pg 63. The strategies are important in bringing out high performance of institution of high learning in webometrics ranking. However, institutions need to encourage scholars to publish more and

upload local content to the repositories in order to showcase their works to the public. Uploading lecture notes and course outlines should be done to the latter to increase web presence hence high webometrics ranking.

Management support is essential in the process of webometrics ranking. The findings revealed that the, University of Nairobi supports web ranking process through the provision of funds, education and training of staff, promotion and marketing strategies and provision of adequate computer hardware as shown in Table 4.12 pg 64. This implies that the university gives adequate support in working towards achieving high performance in the rank. The literature review notes that webometrics ranking process centers more on the activity and visibility of an institution in the web hence availing adequate computer to institutions is not enough but ensuring that the computer systems are enhanced with modern technology is more appropriate to scholars as suggested by the University of West Indies office of planning and development (2011: 15).

5.1.5 Challenges of Webometrics Ranking Process

The fourth objective of the study was to establish challenges faced in support of webometrics ranking of universities in institution of higher learning in Kenya. The study established that the absence of digital repositories and lack of information communication technology are the major challenges that affect webometrics ranking practices in institutions of higher learning in Kenya as shown in Table 4.13 pg 65. This may be attributed to the digital divide in the country as some institutions in Kenya are highly advanced in technology than others and some are developing their ICT infrastructure at the moment. Moreover, Institutions from developed countries have advanced digital repositories and this poses great challenge for institutions of higher learning in developing countries to perform highly (Ezema, 2013:5). Lack of knowledge and skills was the

least cited challenge in institutions which meant that institutions are knowledgeable on webometrics ranking strategies and measures. Respondents noted that funding, training, sensitization, uploading publications and provision of modern systems and technology are the possible solutions in improving institutions performance in the rank as illustrated in Table 4.14 pg 66. It is therefore, paramount for institutions of higher learning in Kenya to increase content in the institution repositories and ensure they are visible to the public.

5.2 Conclusion

Based on the findings and discussions presented in the preceding sections, the study makes the following conclusions:

- Webometrics ranking promotes quality of research and education in academic institutions in Kenya hence webometrics ranking strategies and measures should be implemented to the latter to support research activities and excellence of education systems in the rapid growing knowledge based society.

- Institutions of higher learning are knowledgeable about webometrics ranking practices, hindrance of digital divide and absence of repositories to deposit local content are major barriers to them being ranked highly in the ranking of universities. There is need for provision of local ranking measures to curb the divide between developed and developing countries.

- Institutions of higher learning in Kenya are putting down measures to support the process of webometrics ranking through the open access policy, advocating for scholarly research and publications, marketing and branding strategies, collaborations and partnership,

benchmarking, creation of user friendly websites, enrichment of institutional repositories, publishing and archiving of content as a bid to improve performance in the rank.

- Provision of advanced systems and technology will boost institutions ability to compete in the rank. Re-visiting the teaching mode is also important as the study revealed that most of the students just read for the sake of passing exams and not gaining the relevant skills and information for the future.

5.3 Recommendations

From the study findings the following recommendations were made:

5.3.1 Enrichment of Digital Repositories

Digital repositories should be updated with more content in terms of course outlines and lecture notes. This is to enhance high level of online usage hence promoting webometrics ranking strategies. Local content that is left bare should be factored in the repositories to enrich content and institutions of higher learning should help scholars publish their works and upload in the institutional repository.

5.3.2 Adequate Modern Facilities

Institutions of higher learning in Kenya should move away from old computer systems and instead embrace new advanced modern technologies. This is because information communication technology plays a key role in facilitating webometrics ranking perfomance. The facilities should be adequate to cater for the growing number of student population in institutions.

5.3.3 Measures for Sustainability Strategies

Institutions should create awareness on webometrics ranking practices. This should be done with the aid of management support as web ranking is a new area that is of keen interests to many institutions of higher learning in Kenya. Institutions should provide sufficient information on webometrics ranking in the university website to grow vast interest in the area.

5.3.4 Education and Training Opportunities

Introduction of new technologies brings a number of challenges to institutions of higher learning. Change management from one system to another should be done systematically to avoid culture shock and bring out ease in working with the systems. Through education and training of staff, new systems and strategies are relayed to both staff and students and enhances unity towards working to enhance webometrics ranking strategies which are crucial for the university rank globally and even regionally.

5.3.5 Framework on Strategies for Webometrics Ranking Performance

The researcher recommends the framework in figure 5.1 pg. 78 below to be adapted by institutions of higher in order to improve performance in webometrics ranking of universities.

5.3.5.1 Web Champions

Institutions of higher learning should work with web champions closely to effect webometrics ranking performance in the rank as they are in charge of the design of websites, which include; URL naming, conversion of content to readable and downloadable formats, creation of links between websites to enable sharing of information, ensure that the websites have appropriate language to aid scholars in the search for information and development of interactive search

engines and interfaces to aid in accessibility and usability of the content. Development of user friendly websites and multiple language selection of content will create wide number of users from across the world thus enhancing visibility of an institution.

5.3.5.2 Publications

Institutions of higher learning should strive immensely to promote research activities and make sure it is uploaded online. This will guarantee that the institutions research activity is visible and the rich local content is shared to the public hence promoting webometrics ranking performance of institutions. Content should also be archived to ensure back-up of content in case of any damages or loss of information. Development of institutional repositories should be encouraged as it's the hub of storage of all the university activities in the web. Funds should be allocated to newly created public universities to support development of repositories and even enrichment. Student lecture notes and course outlines should also be uploaded online in order to get several visitors to the sites hence the more the visits in the sites the high the Webometrics ranking.

5.3.5.3 Open Access

Institutions of higher learning should ensure that electronic access to scientific publication is free as this will promote visibility of the publications to the public at any time and place. The content should also be in accessible formats that can be easily downloaded and saved for further reading. Consequently, institutions should enhance information communication and technology infrastructure to support open access initiatives through increasing the bandwidth and internet connectivity within the university and remote access outside the university.

5.3.5.4 Marketing and Awareness

Marketing and awareness on webometrics ranking by institutions should be done by involving all the stakeholders. This will ensure that all the departments work together in raising standards and maintaining performance of the university in the rank. Training of users should also be done on a frequent basis so as to ensure that the students have skills in accessing online resources conveniently. Staff should also be trained on Webometrics ranking strategies to enhance the practice in institutions. Funds should also be provided and utilized to ensure that webometrics ranking facets are put in place. Collaborations and partnerships with other institutions will also ensure that resources are shared and costs are reduced; this will subsequently ensure visibility of institutions through the ability to share knowledge and skills in one platform. Benchmarking systems should also be encouraged as it ensures growth and development of institutions through the ability to capture what is done in another institution and implement it another institution. Scholars should also be encouraged to cite works from studies within the university to increase visibility of publications in the institutions. Summary of the strategies is as shown in figure 5.1 pg 78.
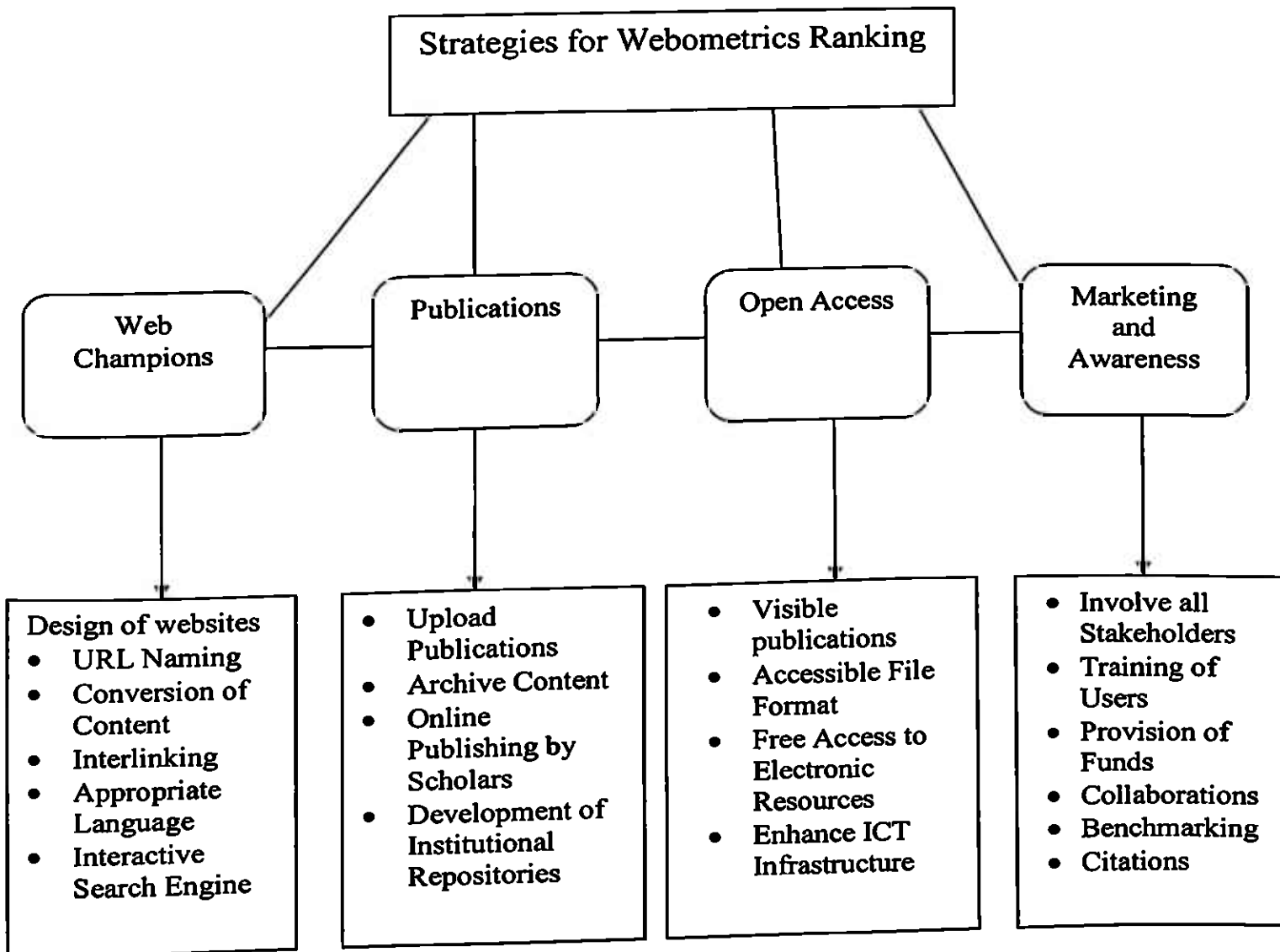
Figure 5.1: Strategies for Webometrics Ranking (Source: Researcher, 2015)

5.4 Suggestions for Further Research

The study identified some gaps and therefore suggests the following areas for future research:

5.4.1 Training on Academic Publication and Citations

Publications are important for webometrics ranking of institutions of higher learning. In order to ensure that scholars deposit their works to the institution repositories and publish in academic journals and blogs, proper training should be conducted to aid in the process. The importance of this study is to ensure that scholars publish works without any barrier.

5.4.2 Integrate the use of Social Media

The university should promote the use of social networking – Facebook, YouTube, Twitter, LinkedIn to promote the institutions research and education, promote communication and information sharing between students, staff and alumni, showcase best projects in YouTube and encourage students/staff to blog as a way of enhancing visibility of the institution.

5.5 Chapter Summary

The chapter has highlighted key findings in the study, given recommendation and suggested further research options. Institutions of higher learning have to put down appropriate strategies to rise above their performance in the rank and maintain the high performance. Support from staff, student and university management is crucial in working towards high webometrics ranking performance.

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APPENDIX I

INTRODUCTION LETTER

Dorothy F. Khamala,
P.O. Box 8955-00200,
Nairobi

19th August 2015

Dear Respondent,

RE: INTRODUCTION LETTER FOR RESEARCH

I am a student at the University of Nairobi pursuing Master's Degree in Library and Information Science. I am conducting a research on Webometrics Ranking in Relation to Quality Education and Research in Academic Institutions in Kenya: Survey of University of Nairobi. The study is guided by the following objectives:

1. Find out the relationship between webometrics ranking and the quality of research and education in University of Nairobi.
2. Assess the perceptions of staff and students on webometrics ranking in institutions of higher learning.
3. Identify the strategies that enabled the selected universities to be ranked highly in webometrics ranking of universities.
4. Establish challenges faced in the process of webometrics ranking of universities.
5. Suggest framework of strategies for high webometrics ranking in institutions of higher learning in Kenya.

Kindly assist by filling in the questionnaires where appropriate as the information that you will give will be for academic purposes only and will be kept confidential.

Thank you,

Dorothy Flora Khamala

APPENDIX II

AUTHORIZATION FOR RESEARCH LETTER

UNIVERSITY OF NAIROBI

FACULTY OF ARTS

DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE (DLIS)

Telephone: +254 20 318262. Ext 28095
Telegram: Varsity
Fax: +254 20 2245566

P.O. Box 30197- 00100 GPO
Nairobi, Kenya.
dnjraine@uonbi.ac.ke

Our Ref: UON/CHSS/DLIS/303   19th August, 2015

To whom it may concern

Dear Sir/Madam,

SUBJECT: RE: KHAMALA, FLORA DOROTHY REG NO: C54/60874/2013

The above-named is undertaking master in Library and Information Science (MLIS) in our Department. She is undertaking her research which is a partial fulfillment in the programme.

Her research topic is *Webometrics ranking in relation to quality of research and education in institutions of higher learning in Kenya the case of University of Nairobi*

Any assistance accorded to her will be appreciated.

UNIVERSITY OF NAIROBI LIBRARY
P. O. Box 30197
NAIROBI

for. Dr. Dorothy Njiraine
Ag. Chairperson
Department of Library & Information Sciences (DLIS)

86

APPENDIX III

QUESTIONNAIRE FOR POSTGRADUATE STUDENTS

INSTRUCTIONS

Please indicate your response by ticking (√) the provided boxes. For questions that require suggestions or comments, please use the provided space.

Background Information

1. Gender...

2. Highest Educational Level...

3. Age:

        a) Below 25   ☐

        b) 25-30   ☐

        c) 30-35   ☐

        d) 35-40   ☐

        e) 40-45   ☐

        f) 45-50   ☐

        g) Above 50   ☐

Webometrics Ranking and Quality of Research and Education

4. Indicate from the list the benefits of webometrics ranking in Institutions of Higher Learning. Use the following scale: 5=Strongly Agree, 4=Agree, 3= Neutral, 2= Disagree, Strongly Disagree.

NO.	BENEFITS OF WEBOMETRICS RANKING	5	4	3	2	1
1.	Supports Research work					
2.	Enhances Competition Among Institutions					
3.	Enhances Collaborations with Other Institutions					
4.	Increases Donor Funding to an Institution					
5.	Increases Student Enrollment					
6.	Increases Visibility of an Institution					

5. Statements in this question are related to the nature of website that would lead you to access specific journals. Select the one that applies to the use of e-resources using the scale of: 5=Strongly Agree, 4=Agree, 3= Neutral, 2= Disagree, 1=Strongly Disagree.

NO.	WEBSITES AND ACCESS OF JOURNALS	5	4	3	2	1
1.	User-Friendly					
2.	Navigation Routes					
3.	Loads Pages Faster					
4.	Multiple Language Selection					
5.	Options to Save the Document Through Electronic Mail or Social Network					
6.	Appropriate Content					

Perceptions on Webometrics Ranking Process

5. How do you perceive the process of webometrics ranking of institutions of higher learning?
   a) Satisfactory ☐
   b) Not satisfactory ☐
   c) No opinion (Not sure) ☐

6. In your own opinion, what should be done to enhance the webometrics ranking process?

....

Strategies for Sustaining Web Ranking Performance

7. How did you get to learn about webometrics ranking of institutions of higher learning?

   a) Colleague/friend ☐

   b) Lecturer ☐

   c) Bulletin board ☐

   d) Library website ☐

   e) Internet ☐

   f) Media ☐

   g) University mandate ☐

   h) Any other...

8. How can you rate the level of training in relation to the use of electronic resources in your institution?

   a) Very high level of training ☐

   b) Low level of training ☐

   c) Not trained all ☐

   d) Highly trained ☐

   e) Moderately trained ☐

9. In order for an institution to maintain or improve its performance in the rankings, certain measures need to be upheld. Indicate the extent to which the following measure can be effective to any institution of higher learning using the following scale: 5=Strongly Agree, 4=Agree, 3= Neutral, 2= Disagree, 1=Strongly Disagree.

NO.	STRATEGIES FOR WEBOMETRICS RANKING	5	4	3	2	1
1.	Archiving of Content					
2.	Publishing					
3.	Creation of User Friendly Websites					
4.	Development of Institutional Repositories					
5.	Marketing and Awareness					
6.	Option for Use of Multiple Language					

Challenges of Webometrics Ranking Process

10. Indicate from the list below challenges faced in institutions of higher learning in regard to webometrics ranking.

NO.	CHALLENGES	YES	NO
1.	Inadequate Information Communication Technology		
2.	Few/no Scholarly Publications		
3.	Courses/Programs Offered		
4.	Absence of Digital Repositories		
5.	Inadequate of Funds		
6.	Lack of Knowledge and Skills		

11. In your own opinion, please suggest possible solutions to the identified challenges.

....

QUESTIONNAIRE FOR ACADEMIC AND ADMINISTRATIVE STAFF

INSTRUCTIONS

Please indicate your response by ticking (√) the provided boxes. For questions that require suggestions or comments, please use the provided space.

Background Information

1. Gender..

2. Highest Educational Level..

3. Age:

    a) Below 25 ☐

    b) 26-35 ☐

    c) 36-45 ☐

    d) 46-55 ☐

    e) 56-65 ☐

    f) 66-70

Webometrics Ranking and Quality of Research and Education

4. Indicate from the list the benefits of Webometrics ranking in institutions of higher learning. Use the following scale: 5=Strongly Agree, 4=Agree, 3= Neutral, 2= Disagree, 1=Strongly Disagree.

NO.	BENEFITS OF WEBOMETRICS RANKING	5	4	3	2	1
1.	Supports Research Work					
2.	Enhances Competition Among Institutions					
3.	Enhances Collaborations with Other Institutions					
4.	Increases Donor Funding To an Institution					
5.	Increases Student Enrollment					
6.	Increases Visibility Of an Institution					

5. Statements in this question are related to the design of websites. Select the one that applies to the nature of websites in your university, using the scale of:5=Strongly Agree, 4=Agree, 3= Neutral, 2= Disagree, 1=Strongly Disagree.

NO.	WEBSITE AND ACCESS OF JOURNALS	5	4	3	2	1
1.	User-Friendly					
2.	Navigation Routes					
3.	Loads Pages Faster					
4.	Multiple Language Selection					
5.	Options to Save The Document Through E-mail or Social Network					
7.	Appropriate Content					

Perceptions of Webometrics Ranking Process

6. How do you perceive the process of Webometrics ranking of institutions of higher learning?

   a). Satisfactory ☐

   b). Not satisfactory ☐

   c). No opinion (Not sure) ☐

7. In your own opinion, what should be done to enhance the webometrics ranking process?

....

Strategies for Sustaining Web Ranking Performance

8. Indicate how you learned about webometrics ranking of universities.

   a) Colleague/friend ☐

   b) Lecturer ☐

   c) Bulletin board ☐

   d) Library website ☐

   e) Internet ☐
   ☐

   f) Media ☐

   g) University mandate

   h) Any other...

9. Select from the list how you gained information and skills on webometrics ranking.

a) Formal Training in the Library ☐

b) Seminars and Workshops Organized by the Library ☐

☐

c) Informally

d) Self Instruction ☐

10. In your opinion, to what extent has the university management supported the process of web ranking in terms of the following facilities- and -services?

NO.	FACILITIES AND SERVICES	EXCELLENT	GOOD	FAIR	POOR
1.	Adequate Computer Hardware				
2.	Education and Training of Staff				
3.	Promotion and Marketing Strategies of Webometrics Ranking				
4.	Funding				

9. Select from the list the strategy employed in your institution that led to the high latest webometrics ranking.

NO.	STRATEGIES FOR WEBOMETRICS RANKING	YES	NO
1.	Open Access Policy		
2.	Electronic Access to Scientific Publications		
3.	Scholarly Research and Publications		
4.	Marketing and Branding Strategies		
5.	Collaborations and Partnerships		
6.	Benchmarking System		

Challenges of Webometrics Ranking Process

12. Indicate from the list below challenges faced in institutions of higher learning in regard to webometrics ranking

NO.	CHALLENGES OF WEBOMETRICS RANKING	YES	NO
1.	Inadequate Information communication Technology		
2.	Few/no Scholarly Publications		
3.	Courses/Programs Offered		
4.	Absence of Digital Repositories		
5.	Inadequate Funds		
6.	Lack of Knowledge and Skills		

13. In your own opinion, suggest possible solutions to the identified challenges.
....
....