COMPARATIVE ASSESSMENT OF INFORMATION AND KNOWLEDGE SHARING AMONG ACADEMICS IN SELECTED UNIVERSITIES IN NIGERIA AND SOUTH AFRICA

BY

SANI ABDU FARI

BLIS, PGDM, MIS

Submitted in fulfilment of the requirements for the Degree of Doctor of Philosophy in Library and Information Science of the University of Zululand, South Africa

2015

DECLARATION

I declare that this study, “Comparative assessment of information and knowledge sharing among academics in selected universities in Nigeria and South Africa”, except where otherwise stated in the text, is my own original work and that, it has not been presented for the award of any degree at any other institution. All the sources consulted and used in the compilation of this document have been duly acknowledged both within the text and in the reference.

Sani Abdu Fari — Date ……..

201100888

……. — Date ……..

Supervisor: Professor D. N Ocholla

Department of Information Studies

University of Zululand

DEDICATION

I dedicate this thesis to my late father Alhaji Abdu Fari, my mother Hajiya Sa'adatu; my wife Maijidda and my children, Sa'adatu (Amma), Fadimatu, Halimatu, Aminatu and Muhammad Sani (jnr.).

ACKNOWLEDGEMENT

All praise is to Allah (SWT) the most gracious most merciful. I wish to thank the management at Umaru Musa Yar'adua University my employer for granting me the support and scholarship to further my studies, and the University of Zululand for granting me the opportunity, and financial and material support to complete this research work.

To my supervisor, Professor D. N. Ocholla, I acknowledge and salute his tireless effort and constructive and critical appraisal and advices throughout the course of my studies. My Head of Department Professor B. J. Mostert for her encouragement and support, and all the staff in the Information Studies Department at the University of Zululand.

I also wish to thank my father, Alhaji Abdu Fari who died few months (29-10-2014) before I finished this research and my mother, Hajiya Sa'adatu (Yaya), for their untiring support and prayers; may Allah (SWT) make Jannat Firdaus their final abode amen. To the entire Fari family, I say a big thank you and may Allah (SWT) shower more blessings on you all.

To my wife, Maijidda for her encouragement, prayers and patience and to my children, Sa'adatu, Fadimatu, Halimatu, Aminatu and Muhammad Sani(jnr), for their prayers and patience throughout the period of this studies. I will forever appreciate the constant assistance, advice and prayers of my brothers especially Hayatu Abdu Fari, who has always been there for me through thick and thin, Egnr. Sanusi Fari, Surajo Fari, Tajo Fari, Sule Fari, Sadiq Fari, Samaila Fari, Dalha Fari, Usman Fari, Musa (Dashi) Fari, and Yusha Fari, and my sisters, Magajiya Fari, Aisha Fari, Kaltume Fari, Amina Fari, Uwani Fari, Binta Fari, Maryam Fari and Halima Fari, to name a few. I also wish to thank my friends, Abubakar Amiru, Ja'afaru Abubakar, and Babangida Dangani, and my colleagues, Musa Ahmad Jibril, Mustapha Mashaba, and Ntando Nkomo, for their consistent advice, memorable moments shared and prayers.

ABSTRACT

This study sets out to investigate information and knowledge sharing among academics in selected universities in Nigeria and South Africa. The areas focused upon were universities in the two countries and three each were sampled.

The data was gathered through literature review, field survey, and the Bibliometric analysis of publications in Scopus, an online database. The combined techniques of purposive and probability random sampling were applied to determine the required sample frames of universities and respondents respectively. The respondents were drawn from Ahmadu Bello University (ABU), Federal University of Technology Minna (FUT) and Umaru Musa Yar'adua University (UMYU) in Nigeria, and University of KwaZulu-Natal (UKZN), Durban University of Technology (DUT) and University of Zululand (UZ) in South Africa. A Questionnaire was administered to obtain the necessary data from sampled academics in the selected universities. The questionnaire was administered to a total of 382 respondents comprising academic staff in both countries and a response rate of 311 representing 81.41% was achieved. Data was analysed using both quantitative statistical package for social sciences (SPSS) version 21 and UCINET version 6.0 to represent data obtained from the SCOPUS database. Four null hypotheses were tested at $\alpha = 0.05$ using Correlation and the T-test.

The demographic data revealed that majorities of the surveyed academics in Nigeria (74%) and South Africa (70.7%) were male, and had Master's Degrees (52.5% Nigeria; 51.1% South Africa). Majority of the respondents were also in the Humanities (57.1% Nigeria; 41.3% South Africa), and had between 11 to 20 years of (42.0% Nigeria; 53.3% South Africa). The overall results revealed that the academic respondents from Nigeria (100%) and South Africa (100%) understand and participated in information and knowledge sharing through various means, such as seminars, conferences and workshops. The academics in the Nigerian universities indicated that they share and preferred information on additional jobs and scholarship availability, while the South African academics showed more interest in new technologies and collaborative initiatives. There was evidence that the surveyed academics in both countries shared information: through personal discussions; on research progress with others, both within and outside their universities and disciplines; and before undertaking research. The study determined that information and communication technologies (ICTs) are being used by the academics in the selected universities for information and knowledge sharing. All the surveyed academics indicated that they used the most common ICTs such as computers (100% Nigeria; 100% South Africa), mobile phones (100%

Nigeria; 100% South Africa), internet facilities (100% Nigeria; 100% South Africa), and USBs (100% Nigeria; 100% South Africa). However, the overall utilization of ICTs was higher in the surveyed South African universities.

The top collaborating authors were found to be from South Africa, while the top two collaborating universities were from Nigeria. However, it was established that there were far more collaborative ties both within and outside the selected universities and countries in South Africa than in Nigeria. The study found that knowledge sharing positively affects academics in their teaching, research, self-development and community service, with varying magnitudes with respect to selected universities in each country and the type of effect. And the number of collaborative ties both within and outside their universities and countries are more in South Africa than in Nigeria.

Many problems were found to be affecting effective information and knowledge sharing, such as poor research management; poor communication of conferences, seminars and workshops among academics; poor support services; and negative attitude to sharing on the part of some academics.

The study recommended that the prevailing problems of knowledge sharing could be decreased by the provision of some basic services, in particular: effective research management and support, adequate information resources and services, and strict policies to persuade academics to undertake and publish joint research results. It is also necessary to improve awareness among academics on the importance of information and knowledge sharing. Other recommendations include:

1. Further research should be embarked upon to compare African universities with European, American universities to ascertain the real problems behind the poor research performance of academics and universities on the continent and between Europe and America.
2. Multinational initiative to encourage and support African scholars participation to international academic gatherings which are usually hindered by travel/diplomatic issues
3. African universities must ensure further training and retraining of academics especially on information literacy skills and lifelong learning to emphasize the relevance of collaborative research via social interactions such as the Web 2.0 etc.

TABLE OF CONTENTS

CHAPTER EIGHT: Summary, Conclusions and Recommendations

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

ABU	Ahmadu Bello University
ADAPT	Advanced Digital Appreciation Program Tertiary
CHE	Council for Higher Education
DoE	Department of Education
DUT	Durban University of Technology
NCHE	National Commission for Higher Education
NECO	National Examinations Council
NUC	Nigeria University Council
PTDF	Petroleum Technology Development Fund
SAQA	South African Qualification Authority
SASCO	South African Students Congress
SCT	Social Capital Theory
SECI	Socialization, Externalization, Combination and Internalization
SPSS	Statistical Package for Social Sciences
TAM	Technology Acceptance Model
TETFUND	Tertiary Education Trust Fund
UKZN	University of KwaZulu-Natal
UMYU	Umaru Musa Yar'adua University
UZ	University of Zululand
UDHR	Universal Declaration of Human Rights
UN MDGs	United Nations Millennium Development Goals

Glossary

Academic is a faculty member, such as a lecturer, professor, etc. in a higher institution of learning that partakes in teaching and research activities.

Collaboration signifies a partnership or joint effort between individuals, groups, or organizations towards the execution of a project or research for the common benefit of the participants.

Communication is the transfer of knowledge, information, data or an idea.

Information and Communication Technology (ICT) describes all media and a mix of converging technology involved in the dynamic sourcing, acquisition, processing, storage, preservation and transfer of analogue and digital data

Information literacy is the ability to scrutinize and comprehend what we perceive in documents, on screen, in posters, pictures and other images as well as what we hear.

Information refers to facts that have been scrutinized and/or contextualised, convey a meaning, and make a distinction as supposed by the recipient.

Information sharing is the act of offering a cooperative response to a demand for information.

Knowledge is individual excellence that constructs on data and information simultaneously with experience, ideals, and insight.

Knowledge sharing is the provision, transfer and or exchange of ideas and expertise between individuals, groups or organisation

Network This describes established communication ties between two or more individuals or groups.

Research work is scientific investigations.

Sharing Having or using something in common with other people.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

In contemporary societies we rely on information to perform daily activities and largely communicate ideas both at local and international levels for successful execution of our routine responsibilities. Information and knowledge transfer from one generation to another improves our communal activities and engagements, corporate cognitive experiences, and scientific communications (Ball, 2011:4-5). Therefore, Governmental policy formulation and implementation, educational development/management, and research activities, are all dependent on effective information transfer between individuals. Today we rely on information to improve our daily living and pave a smoother path in advance for future plans (Umar, 2009:23).

The use of modern technologies referred to as ICTs enables the efficiency of our daily information transfer and retrieval processes, thereby revitalising and strengthening this phase of development in our societies (Schmiede, 2009:620-25). These technologies have transformed the patterns used by individuals for information and knowledge seeking and have equipped people with the required gadgets for exploring information in different forms and formats.

This study focuses on the information and knowledge sharing activities between and among academics in selected universities in Nigeria and South Africa, with a view to investigating the collaborative nature and trends in research involving individual academics and particular universities between the two countries using co-authorship as a measure.

This chapter introduces the study and discusses the research background. The chapter outlines the conceptual and contextual settings of the study; statement of the problem; motivation of the study; assumptions of the study; the aim and objectives of the study; scope and limitations of the study; significance of the study; the research questions; hypotheses; and conclusion. The contextual and conceptual settings discussed include: the definitions of information and knowledge; characteristics, importance and application of information and knowledge; information and knowledge sharing; and the study areas.

1.1 Research background

The conceptions of data, information and knowledge are important for understanding and contextualising knowledge sharing. Numerous scholars have addressed the distinctions between data, information, and knowledge (Aliyu 2007; Britz and Ponelis 2012; Donate and Guadamillas 2011; Umar 2009). Data is described by Suurla, Markkula and Mustajarvi (2002:35) “as codes, signs and signals that do not necessarily have any significance as such”. In other words, data consists of raw facts (as in numbers) that have no context or meaning on their own. Data becomes information when it is organised, patterned, grouped, and or categorised, which increases its depth of meaning to the recipient. Information as a concept takes on different meanings depending on the context in which it is discussed.

1.1.1 What is Information?

There are many definitions of concept information. For example, according to Aguolu (2000:9), information is a “message of human experience, what is transmitted, a signal, or a stimulus that assumes a response in the receiver, and therefore, possesses response potentials”. Womboh and Margaret (2002:3) defines information as “processed data that can be safely used for decision making or a natural phenomenon which is abstract but can be manifested or represented in various physical formats”. Okee (2005:87) defines it as “a critical resource to the growth and development of any individual, group or nation. It is regarded as a vital resource comparable to other natural resources”. Provision of and access to accurate information at the right time and to the right users is important for the growth and development of any society.

1.1.2 Why is information important?

Byerly and Brodie (1999) describe Information as a vital component for creativity and innovation, a basic resource for learning and human thought, a key resource in creating more knowledgeable citizens, a factor that enables citizens to achieve better results in their academic lives, and an important resource for national socio-economic development. Curtis (1999) surmises that information is vital for technological, educational, social, and economic progress. In specific terms, development is significantly enhanced by information because it is both a pure channel for growth and development, and a powerful tool for furthering the progress of development. The latter

is the degree to which a society continues to improve its social, economic, and political environment. Information plays a leading role in the interaction process between people in contemporary society. The world has effectively become one big neighbourhood and the lives of people have become so intertwined that every situation that affects one corner of the world now forms part of the day-to-day reality of every individual, community, organization or nation (Sam 2005).

Recognizing its significance, information is sought in a greater capacity by an increasing number of individuals (Ugah 2008). This increases the quantity and quality of existing sources and contributes to the current information overload, which is the stress caused by the availability of too much information in different varieties, formats, and sources. For Gray and Perry (1975), to be well-informed implies three conditions: the information must exist in suitable forms; we must know that it exists; and we must know how to find and use it. Therefore, unless we are aware of the availability of information and are able to access it, we cannot ascertain its value or even comprehend its meaning. We also need to constantly assess the reliability and validity of the information that we access.

Academic activities, governance, public service, and industry and commerce would not occur without the regular sharing of up-to-date, relevant, and timely information and knowledge. This is why academic institutions with the right technological capacity are developing systems for collecting, processing, storing, managing, and sharing information through tacit and explicit knowledge holdings and networks. In today's information driven society, knowledge is not only used to improve efficiency and ethical practices, but also to understand the political, social, economic, and technological environments that enables its sharing and utilization. Academics need information about current research and development activities, and their socio-economic implications in their fields and information. This helps them to find and sift through all of the relevant knowledge existing on a given subject. They also need particular items of information that are essential in their day-to-day work and activities.

Information has been given prominent attention by major UN and regional organisations (UDHR, WCSIS, UN MDGs, and African Charter on Human Rights). In 1945, the United Nations endorsed information in the Charter of the Universal Declaration of Human Rights (UDHR) as a fundamental Human right. This emphasises the right to freedom of opinion, which includes the right to seek, receive, and impart information via any

medium regardless of the content and geographical boundaries (Froechlich, 1997:11; United Nations, 1995:305). One of the main arguments in the UDHR document is that, ensuring that information can be accessed by individuals guarantees the path to achieving this fundamental right. The African Human and Peoples' Charter was declared in support of the UN charter. Article 9, subsection 1, avows that every person shall have the right to access information (Umozurike, 1997:148; United Nations, 1995).

The United Nations world Summit on the Information Society (WSIS) was organised to realise common grounds towards achieving the multi-directional, comprehensive and people-oriented development of a global information society where individuals are free and able to create, access, use, and share information and knowledge. The summit was held in two phases 10 - 12 December 2003 in Geneva and 16 - 18 November 2005 in Tunisia. Annual forums have since been held that reflect on key issues in the development of information societies in different contexts (WSIS, 2003).

1.1.3 What is knowledge?

It is evident from available literatures that knowledge is an intrinsically ambiguous term. It can generally be agreed that "knowledge is the expertise, experience and capability of individuals, integrated with processes and shared memory" (Abell & Oxbrow 2001:73). Information is transformed into knowledge through learning and adoption (Suurla, Markkula & Mustajarvi, 2002). Knowledge can therefore be regarded as volumes of required and relevant information that are capable of effectively changing the way we think, work, and relate with others (Fari, 2011). It is what people know, their expertise, experiences, and judgement (Britz, 2007). Skyrme (2002) mentions Michael Polanyi as the first to make a distinction between two types of knowledge, the tacit and explicit. Polanyi (1966) explains that the knowledge embedded in humans is vital for cognitive decisions and it accumulates through experience and participation in collective organisational and/or communal practices. He refers to this as tacit knowledge.

Uit Beijerse (1999:99) likewise states that "personal or tacit knowledge is extremely important for human cognition, because people acquire knowledge through the active creation and organisation of their own experience". Tacit knowledge is however private and contextually specific because it resides in the minds of people (Allee, 1997). Afiouni (2004) states that knowledge embedded in people and system in organisations brings

about competitive advantages. Explicit or codified knowledge, on the other hand, refers to knowledge that is transmittable in a formal and systematic language (Nonaka and Takeuchi, 1995). Explicit knowledge is expressed as information in various formats that include published works and manuals, routines and procedures. The implication is that most knowledge is tacit and becomes explicit when shared.

1.1.4 Information and knowledge sharing

The successful application of knowledge helps organisations to deliver products and services. Economically, knowledge is viewed as an ingredient for gaining competitive advantage (Cabrera et al., 2006). It is important for organisations to determine who knows what and how that knowledge can be shared between members for competitive growth. The acquisition of knowledge places an organisation in a relevant and competitive position in today's global economy because knowledge is a catalyst for social development. Individuals, organizations, and nations also rely on knowledge to find solutions to problems. This confirms that information and knowledge are essential for decision making.

An increase in the number of Internet knowledge platforms for knowledge acquisition and the emergence of Web 2.0, and other related new developments, have increased the awareness of and participation in virtual communities (Chiu et al., 2006; Hsu et al., 2007; Hsu and Lin, 2008). However, the converse is also true: in a survey, Ruggles (1998) discovered that changing peoples' behaviour is one of the challenges to knowledge sharing. People sometimes refuse to share their knowledge with others in working environments as they accord value to it (Prusak, 1998). This means that people often shy away from sharing their expertise with others. Therefore, the more individuals are willing to share knowledge the higher the value, extent, and frequency of sharing and exchange (Larson, 1992).

As alluded to earlier, societies are evolving into "information societies" where the hub of activities revolve around coordinated and organised information and knowledge transfer for civic practices driven by innovative growth. For Martin (1988:42), an information society is a society that transforms the quality of living and routine practices socially, educationally, and economically, through information and knowledge sharing and transfer. The World Summit on the Information Society (WSIS 2003) defines the

information and knowledge society as that which understands the relevance and integrates the application of technology in the acquisition and transfer of information and knowledge at all levels for global competitive advantage. Jiyane et al (2013) emphasize the importance of information and knowledge transfer and sharing in the society, stating that societies today understand the role that information plays in the overall success of their existence. These societies explore the contents of information resources through modern technologies for educational, economic, and political gains. Thus, information and knowledge sharing facilitates growth, enhances development, widens and expands opportunities, and equips the society with the necessary inputs for decision making. That is why studies by Lor and Britz (2007), Martin (1995), Nassimbeni (1998), Webster (2002), and others, share the belief that societies develop the culture of information and knowledge sharing for growth and development over-time.

A lot of attention has been accorded to information and knowledge sharing (Vanden Hooff and de Ridder, 2004) and improvement (Donate and Guadamillas, 2011). Nonaka (1994) argues that fluidity knowledge creation is attained when a group of individuals share knowledge with each other. The interaction and communication between researchers brings about a "global flow of knowledge" (Britz and Ponelis, 2012). Nonaka and Takeuchi (1995) posit that, knowledge is principally created and shared in four ways:

- Intangible to intangible – through the personal interaction of individuals referred to as "socialisation".
- Intangible to tangible – through the transformation of tacit experience into usable sources by others referred to as "externalisation".
- Tangible to tangible – through the utilisation of the available sources for the creation of new ideas and innovation referred to as "combination".
- Tangible to intangible – through the utilisation of ready and available sources to enrich our understanding and experience referred to as "internalisation".

Sharing of information and knowledge is a process that involves two or more individuals, whereby one provides guidance through expert advice, and the other learns through observation, attention, and information seeking, and vice-versa (Gurteen 1999; Janus-Hiekkarranta 2009; Riege 2005). The benefits of information and knowledge

sharing include self-development, enhanced productivity, and career guidance (Jarvenpaa & Staples 2001), thus leading to positive growth. Bouthillier and Shearer (2002), Cabrera and Cabrera (2002), Gabor and Cloete (2010), and Griffiths (1998) also report that without information and knowledge sharing organisations would be stagnant in areas that include but are not limited to development, inter-departmental cohesion, specialisation, resource control, ideas, timeliness, and cost effectiveness.

Abdel-Rahman & Ayman (2011) states that information and knowledge sharing is a crucial aspect of the knowledge management system of any organisation whose objectives and interests are geared towards enriching its members for sustainable growth and development. Fari (2010) defines information and knowledge sharing as the exchange of ideas, perceptions, results, opinions and facts between two or more individuals, and this can be shared through the following patterns: one-to-one, one-to-many, many-to-many, and many-to-one. The technologies for meeting the four patterns are evolving and include blogs, wikis, and social media, to name a few. As these and other technologies advance, sharing practices are also evolving with respect to data synchronization, data stewardship guiding principles and strategy, and standards for uniform data as they relate to confidentiality, protection and data value. Haas, (2006) outlines a number of reasons for information and knowledge sharing, and they are:

- Enhancing productivity among members
- Facilitating easy and quick information accessibility
- Promoting familiarisation and strengthen relationship among members
- Enhancing the sharing of ideas between and among members
- Saving cost and time, which would have been incurred by individualism
- Improving efficiency and avoiding the duplication of efforts
- Increasing effectiveness and specialisation among members
- Keeping members up-to-date in their field of interest

Another crucial aspect and benefit of information and knowledge sharing is achieving a common purpose because it connects professionals with common interests. Sharing stimulates new ideas and innovations, promotes understanding between professionals, and facilitates access and sharing of valuable information that provide academic support in teaching and research (Jones et al., 2006). Olabisi (2004) observes that in

contemporary society many academics, scientist and technologist obtain much of their information from colleagues during face-to-face conversation, telephone calls, and correspondences. They also acquire much information in more formal ways, such as at national, regional, and local levels and also, during technical meetings and proceedings. More details on types of information and knowledge sharing are discussed in section 3.2 of chapter three.

Effective information and knowledge sharing largely depends on acknowledging and appreciating the differences between data, information and knowledge. As alluded to earlier where data is raw in nature information can be seen as the processed raw data that becomes meaningful to a recipient (Snyder and Wilson, 1998). Knowledge on the other hand, is shared in the course of practice and dynamic involvement in society, which Wenger (1998) referred to as 'knowing in practice'. This means that Knowledge is information that has been established in the course of experiment or validation (Snyder and Wilson, 1998).

1.2 The Study Areas

This section discusses characteristics and useful information about study areas

1.2.1 Nigeria

Nigeria is a developing country, with one hundred and sixty six million two hundred thousand (166,200,000) people according to the 2012 population census as published in the National Population Commission report 2013, the country has long embraced and integrated the collaborative approach through the use of modern technology into all its activities towards achieving the desired outcomes in governance, agriculture, industry, politics and education, these outcomes were motivated by the return of democracy in 1999 and the urge to achieve the Millennium Development Goals (Aliyu, 2007). Led by the revitalisation of the telecommunication sector in the country and the internet revolution in the year 2000, significant investments were made towards provision of Internet services in academic institutions to support knowledge transfer and sharing. In 2010, the Nigerian government approved the establishment of nine more federal universities to cater for the rising number of applicants annually. This addition brought the total number of universities in the country to 117, 36 federal, 36 state and 45 private universities (NUC 2012).

The main goals and roles of the universities in Nigeria are:

- To train human resources for national development;
- To inculcate proper morals for the development of individuals and society;
- To develop and promote the potentials of individuals for local and global competitiveness;
- To provide the necessary physical and intellectual skills for self-reliance and societal development;
- To provide scholarship to citizens and champion community services;
- To promote and strengthen national unity; and
- To stimulate and sponsor national and international cooperation and collaboration. (Federal Republic of Nigeria, 2004, section 45).

In addition, the universities, their affiliate institutions and other tertiary institutions, according to this document shall ensure the provision of an enabling environment for the attainment of the stated goals through the provision of effective teaching; research and development; the development of human resources training programs; smooth and dynamic knowledge management; and the promotion of scholarships and collaboration at local, national and international levels. However, despite the enormous responsibility of the universities especially in meeting the stated objectives many problems have been crippling the efforts.

The Nigerian university system have been through divergent problems ranging from huge number of annual enrolments, poor facilities, poor management, periodic industrial actions and obsolete physical structures. These issues have crippled the essence of research and development expected of ideal academic institutions (NUC, 2012). To this, Aliyu (2007) argues that, the poor infrastructure, and arbitrary management in Nigerian universities have had profound effect on the expected performance of academics especially with regards to information processing, knowledge transfer and collaborative ties. There is therefore, an urgent need for more investigations in Nigeria that aim to understand and unveil the critical issues affecting teaching and research, which are the bedrock of any academic setting. The current study examined the information and knowledge sharing activities in comparison to that of South Africa a country believed to be more productive in research and collaboration in Africa, in a bid to uncover the problems areas and bridge the gap for enhanced output.

1.2.2 South Africa

With the fall of apartheid, there was a mandate and huge expectation for the South African higher education system to ensure access to quality education to its citizenry (Vender, 2010). The South African Education White Paper 3 of 1997 was geared towards revitalising the higher education system (DoE, 1997) by highlighting many pressing issues that related to the apartheid system. The main issues/key objectives addressed by the White Paper 3 were democracy, equity, redress, autonomy and efficiency. These issues were mostly tabled by the African National Congress (ANC), Union of Democratic University Staff Association (UDUSA) and South African Students' Association (SASCO), who were informed by the post-1994 policy criticisms of the National Commission for Higher Education (NCHE), the National Education Policy Initiative (NEPI, 1993) and similar entities. The new South African Constitution declared that the public and various institutions should recognise and respect human dignity and equality for all. The Bill of Rights (Republic of South Africa, 1996) promotes a society that is free from sexism and racism, encourages the freedom of individuals and provides human rights assurances in addition to promises to respect, protect, promote and fulfil the rights.

In support of the new constitution the Higher Education Act (1997) pronounced the urgent need to redress and revitalise the institutions through: the introduction of relevant programs that would realise educational, human resource and fiscal development requirements; the promotion of equality; and the encouragement of collective efforts and representation towards achieving international academic standards in education and scholarship. Higher Education Institutions were also accorded autonomy with respect to the rule of law and accountability. The vision was to transform the higher education sector in the country into a reformed, independent, non-racial and non-sexist system. It was expected that these developments would pave the way for Higher Education institutions to disseminate knowledge, skills and expertise thereby producing graduates who could apply their knowledge to national developmental activities (DoE, 1997:114). The Constitution, Higher Education Act, and other factors led to the extensive reformation and revitalisation of Higher Education in South Africa (Mouton, Louw & Strydom, 2012). Changes were made to the entire system that affected the scope and nature of institutions, management, programs, students' admissions, accountability,

autonomy, and so forth (Jansen, 2004; SASCO, 1997; Vandeyar, 2010). Many Higher Education institutions merged in the year 1999 following the instructions of the Minister of Education informed by the Higher Education Act of 1997 (DoE, 1997; Mfusi, 2004). The then 21 universities were reduced to 11, 150 technical colleges were combined and reduced to 50, while the 120 colleges of education were either merged with universities or technikons (DoE, 1997; Moton et al., 2012). Despite the merger and revitalisation of the system more than a decade ago the challenges of equity, access and quality remains omnipresent in higher education institutions in the country today (CHE, 2010; Le Grange, 2011).

The National Plan for Higher Education (NPHE, 2001) reveals that, the funding of Higher Education institutions is critical to achieving five objectives contained in the policy namely:

- Producing quality graduates for socioeconomic development of South Africa
- Ensure equal opportunities in the Higher Education system
- Accommodating the diverse nature of South African communities
- Encouraging and stimulating research activities
- Revitalising the structure of Higher Education system

South Africa now has twenty five public universities which are spread across the nine provinces in the country with different developmental histories in terms of establishment and services. However, they all objectively and collectively strive towards the common purpose of human resource development for the country. This is highlighted in the National Policy on Higher Education (NPHE) documents, can best be achieved through the provision of necessary support, funding and facilities for teaching and research and includes facilitating partnerships with sister universities within the country and others abroad to achieve common grounds for competitive growth.

Twenty years since democracy, there have been considerable efforts by the South African Government to transform the higher education sector. However, Govinder, Zondo and Makgoba (2013) report that the transformation trend is very slow.

This study investigates the information and knowledge sharing activities of academics in comparison to Nigeria in order to identify challenges and possible areas of improvement to achieve greater heights in collaborative research output.

1.3 Statement of the Problem

Universities are considered to be the citadels of research, teaching and learning. Umar (2009) stated that, societies formally develop and establish universities to promote learning, providing the societies with the necessary ideals and ideas. Benjamin (2001) posits that, higher institutions of learning support development through the provision and transfer of necessary skills and expertise to the common man. Universally, universities are societies of scholars that ensure the free flow and acquisition of information and knowledge (Banjo, 2001; Hannah, 1998; Salter, 1983). They also believe that, since time immemorial universities are the custodians of societal heritage through the preservation, refining, recording and disseminating of the society norms, values, culture and experiences for posterity.

The academic environment and the academics cannot efficiently and effectively coexist to function without the proper provision and utilisation of the necessary resources for success. Information and knowledge sharing play an important role within the university community as highlighted in section 1.1.4. A number of studies have been carried out concerning Information and Knowledge sharing (Aliyu, 2007; Cabrera and Cabrera, 2002; Lee and Ahn, 2007; Reus and Liu, 2004; Ugah, 2008; Umar, 2009) but to the researcher's knowledge, these were not specifically dealing with comparison on academic information and knowledge sharing in general and between the selected universities in the two countries. It is not known how academics in Nigeria and South Africa share information and knowledge in terms of level, type, frequency and the type of ICTs used for sharing. It is against this background that this comparative study was anchored.

1.4 Motivation for the Study

The researcher has had particular concerns about lack of information and knowledge sharing among academics at his university and perhaps in other universities in Nigeria. Nigeria is the largest in the African continent in-terms of population and is endowed with more than its share of natural resources and human capital to sustain the demand of its

populace. However, as observed by the researcher, the research output of Nigeria's academics does not appear to be sufficient enough to tackle developmental demands of the country. Nigeria has more universities and other higher education institutions than South Africa, yet South Africa significantly outperformed other African countries as reported in a study by Reuters (2010). It was therefore important to establish where the problem lies.

1.5 Aim of the Study

The aim of this study is to investigate the information and knowledge sharing activities of selected universities in Nigeria and South Africa.

1.6 Objectives of the Study

The study sets out to achieve the following objectives:

1. Explore the type(s) of information and knowledge shared among academics in the selected universities.
2. Determine the academics' reasons for information and knowledge sharing.
3. Determine the ways and extent to which the academics share information and knowledge.
4. Explore the types of ICTs used for information and knowledge sharing by the academics.
5. Investigate the relationship of information and knowledge sharing on teaching, research, self-development, and community service in the selected universities.
6. Examine the challenges to effective information and knowledge sharing among the academics.
7. Establish the common solutions to effective information and knowledge sharing
8. Analyse the research collaboration trends in the two countries through the application of informetrics using co-authorship as a measure of collaboration.

1.7 Research Questions

This study sought to answers the following research questions:

1. Do the academics share Information and knowledge? This question tried to determine whether the academics participated in information and knowledge sharing.
2. What type of information and knowledge do the academics share?
   The type of information shared is crucial as academics work in different disciplines and have different topics of interest: this question explored what is needed by whom.
3. Why do the academics share information and knowledge?
   The reasons for sharing differ from individual to individual it is important to explore all the possible reasons that prompt sharing among academics for proper and timely identification and dissemination.
4. How do the academics share information and knowledge?
   This question stressed the need to explore the various ways or avenues and patterns used by academics for the purposes of seeking and sharing their information and knowledge with others.
5. How often do the academics share information and knowledge?
   This question basically focused on the frequency of sharing, this in turn reflects whether the information and knowledge shared at a time was up-to-date.
6. What types of information and communication technologies (ICTs) do the academics use for information and knowledge sharing?
   The use of information and communication technology is a modern requirement for the achievement of speedy, timely and remote searching, and for identifying, retrieving, processing, storing and disseminating information. Hence it was necessary to explore the types of ICTs used by academics for the sharing of information and knowledge.
7. How does information and knowledge sharing affect the academics in teaching, research, self-development, and community service?
   Every activity embarked upon by individuals has a certain effect on their daily operations. This question was posed to explore the importance of information

and knowledge sharing with regard to the four basic responsibilities of academics.

8. What are the challenges to information and knowledge sharing?

   This question was formulated to investigate the obstacles to effective and efficient information and knowledge sharing.

9. What are the common solutions to the identified problems?

   In order to be able to tackle the possible problems associated with information and knowledge sharing, the academics had to give their opinions and recommendations towards minimizing them.

10. What is the trend in research collaboration among the academics from 2003 to 2013?

    To be able to answer this question the study required the application of informetrics to study the collaborative trend among academics using co-authorship as a measure.

1.8 Research Hypothesis

Hypotheses are assumptions about what a researcher is intending to investigate and proves or disproves at the end of the study as a result of actual data processing and analysis. It gives the researcher a focus as it is an idea of what the expectations about the investigations are. Hence, the following four null hypotheses were formulated for this study.

Ho1. There is no significant difference in the type of information and knowledge shared among the academics in the selected universities in Nigeria and South Africa.

Ho2. There is no significant difference in the reasons for information and knowledge sharing among the academics in the selected universities in Nigeria and South Africa.

Ho3. There is no significant relationship in the pattern of information and knowledge sharing among the academics in the selected universities in Nigeria and South Africa.

Ho4. Information and knowledge sharing has no significant relationship on the academics in the selected universities in Nigeria and South Africa in their teaching, research, self-development and community service.

1.9 Scope and Limitations of the Study

The study was limited to the information and knowledge sharing practices of academics in selected universities in Nigeria and South Africa. The scope and limitations of the study were identified from different angles. This section highlights the limitations of the study with regards to time, resources, context and concept.

Information and knowledge sharing in Africa in general and Nigerian and South African universities in particular is a broad and complex matter. For this reason, this study for the purpose of gathering the required data for analysis and available resources was limited to 6 selected universities (3 each) from the two countries. The study was also limited to information and knowledge sharing activities among university academics only within and between the two countries. This was mainly due to financial and time constraints, and proximity and logical issues. The universities selected demonstrated the broad characteristics of the two nations, considering the differences in setting, administration, culture, language, ethnicity and location. Responses may be affected by personal feeling and/or attitude of individual respondents hence Bibliometric was used to achieve other aspects of collaborative trends among the academics which increased the period of data processing and analysis.

1.10 Significance of the Study

The findings of this study are expected to go a long way in improving information and knowledge sharing by academics in the two countries and indeed in Africa at large. The study is significant because it highlights contemporary practices in information and knowledge sharing among academics in Nigeria and South Africa and showcases trends in collaborative research in the African context. Focus is also placed on the major contributors to research in Nigeria and South Africa by identifying who shares what and with whom, from which institution and in which field. Improvement of information and knowledge sharing among academics could lead to better utilization of information and knowledge for the fulfilment of greater research objectives in the two countries. It was also hoped that this research would help with the design of information and knowledge sharing network in academic institutions. Within the field of Library and Information Science, the study will serve as an important knowledge contribution in the area of information and knowledge sharing research.

1.11 Methodology

The study used both qualitative and quantitative research methods. Questionnaire was used for data collection from university academic respondents. Literature review was used for understanding past and present status of information and knowledge sharing. A scientometric approach was applied to determine the status and trends of research collaboration between and among the academics in the universities and countries at large using co-authorship as a measure. The online database used for research collaboration analysis was SCOPUS. More detailed information for methodology of the study is presented in chapter 4 and Research design summary table is provided as Appendix A.

1.11 Organisation of the Study

This thesis is divided into three parts, beginning with the preliminary pages that include the title page, dedication, declaration, acknowledgement, list of tables, plates and maps, abbreviations, Abstract, and table of contents. The second part presents the main body of the research which consists of eight chapters, each dealing with specific theme. The third part consists of the end matter which includes the appendices and references.

1.13 Summary

This chapter provided the research background and basic frame work for this comparative study of information and knowledge sharing among academics in selected universities in Nigeria and South Africa. The chapter described the concepts of information, knowledge and information and knowledge sharing. The researcher pointed out the urgent need for action in order to ensure better understanding and cooperation between and among academics in all fields of knowledge.

The main reason is to as much as possible understand the concepts of information, knowledge, information and knowledge sharing its attributes and complexity, and to identify its possible leeway. This chapter also provides a description of the research methodology for the study by formulating the objectives and research questions outlining in concise what information would be sought. The chapter also provides the entire framework for the study where emphasis is placed on the importance of sharing for competitive growth.

The next chapter (2) theoretical frame work, will present the theories used to guide the study.

CHAPTER TWO

THEORETICAL FRAMEWORK

2.0 Introduction

The Centre for Research on Education, Diversity and Excellence (2002) explains that a theoretical framework is a planned structure that has been conceptually developed around theories to guide research. Eisenhart (1991:205) described it “a structure that guides research by relying on a formal theory…constructed by using an established, coherent explanation of certain phenomena and relationships”. A theoretical framework serves to guide a researcher in his or her investigation in a broad field of expertise by expounding on underlying principle(s), rationale, or foundation with respect to the research topic (Khan, 2010). Thus, a theoretical framework is objectively geared towards enhancing clarity, appropriateness and effectiveness in research (Ocholla & Le Roux, 2011). It also unearths broader issues that should be accommodated or refined in relation to the topic under investigation.

This study aimed at examining the information and knowledge sharing activities among academics in selected universities in Nigeria and South Africa. Various research questions were addressed in relation to the research topic as highlighted in Chapter one. The study was concerned about information and knowledge sharing activities and the research collaboration ties established from such interactions. Thus the study examined various knowledge management theories and was complemented by the Social Capital Theory (SCT) and Technology Acceptance Theory (TAM). The concept of information/knowledge sharing cut across all fields, and is a multidimensional practice aimed at communicating expertise, scholarly ideas and research contents to facilitate effective access and use of information and knowledge. The application of modern technologies referred to as ICTs facilitates easy, remote and timely communication, and guarantees wider participation among individuals with common interest through various platforms and networks via the Internet. Hence the SCT was used to understand the patterns, preferences and characteristics of the academics while the TAM was used to address the academics’ acceptance and use of technology for sharing.

This chapter presents, discusses and critiques relevant knowledge management theories, and explains the relevance of the adopted theories to guide the current study.

2.1 Knowledge management theories

Research on information and knowledge sharing as observed by the researcher has been informed by a wide range of theories that include but are not limited to:

- Theory of Planned Behaviour (TPB) (Ajzen,1988) which focuses on designing strategies and guidance towards planning and executing behavioural actions;
- Theory of Reasoned Action (TRA) (Fishbein, 1967) which deals with the variables determining behavioural decisions;
- Social Cognitive Theory (SCT) (Bandura, 1977) which examines the processes of cognitive experiences and values in the assessment and or judgement of individuals;
- Technology Acceptance Model (TAM) (Davis, 1985) that has to do with the acceptance and adaptation of new technologies for relative practices;
- Social Capital Theory (SCT) (Johnson, 1960) which deals with the relationships between individuals for the crosspollination of ideas and innovation based on their knowledge and expertise;

Other theories includes: Expectancy Theory (ET) (Vroom, 1964) which examines the effect and influence of rewards and benefits that can be derived as a result of an individual's actions and performances; the Social Exchange Theory (SET) (Malinowski, 1922) used to study work based behaviour among employees and communities of practice; Social Construction of Technology (SCOT) (Pinch and Bijker, 1987) that examines the social aspect of using technology and the influences therein as it affects individuals; Diffusion of Innovation Theory (DIT) (Rogers, 2003) which investigates the attributes of innovative outcomes and the different effects that they have on the rate of adoption by individuals; SECI Model (Nonaka & Takeuchi, 1995) that examines the transformation of knowledge with regards to experience and literature; and the Self Determination Theory (SDT) (Deci & Rayan, 1985) which deals with the psychological needs of individuals for the attainment of independence, capability and understanding.

These theories are diverse and would be very difficult to address at the same time. The diversity and appropriateness of these theories makes it possible for researchers to apply them in different contexts depending on the research topic and their perceived relevance.

2.2 The proposed theories

Sharing is a good measure of the value of information and knowledge, primarily because it increases productivity and more knowledge acquisition (Cohen and Levinthal 1990). The sharing of information and knowledge is not and cannot be one directional as it benefits both the supplier and the recipient and equips both the organisation and society with the necessary inputs for competitive growth. However, the challenge in information and knowledge sharing lies in the factors that need to be considered where individuals are concerned. These factors range from 'social factors' such as trust, care, mutual understanding and expressive dedication (vonKrogh 1998, McDermott and O'dell 2000, Yang 2004) to 'technological factors' such as ICTs (Goh 2002; Willcoxson 2003; Syed Ikhsan and Rowland 2004; Kim and Lee 2006). Van den Brink (2003) categorized these factors into three namely: individual, organizational and technological. The three factors identified by Van den Brink's were also highlighted as being crucial in a study on a technology model by Orlikowski (1992). The argument here is that, for the full control and utilization of organizational knowledge resources there has to be a well-conceived understanding of the factors affecting individuals with regards to sharing. The proper understanding of the factors affecting individuals would facilitate an effective sharing process where information and communication technologies would be used to provide speedy, timely and remote operations.

This study considered a conceptual approach that reflects on the three categories mentioned by Van den Brink (2003); individual, organizational and technological. Based on this, two theories were chosen to inform this investigation into information and knowledge sharing, namely the Social Capital Theory and Technology Acceptance Model.

2.2.1 Social Capital Theory (SCT)

Fukuyama (2002:27) believes that social capital is a mutual standard or set of ideals through which social co-existence is achieved and developed into a constructive beneficial outcome, while Garip (2008) defines social capital as a means of producing goods and services through constant and casual networks involving mutually benefitting parties or individuals. The World Bank (2000) states that "Social capital is the institutions, relationships and norms that shape the quality of a society's social interaction, thus social capital is explicitly relational". By all accounts, the purpose of social capital is to build ties, create mutual benefit avenues, establish formal and informal networks, bridge the gap between different people, and ensure reciprocity (Godowin & Quisumbing, 2008; Chalupnicet, 2010). The core components of any organization are the individuals who contribute towards the overall success of the system from its inception to the sharing of knowledge with each other and outside parties. While information and communication technology influences sharing, it would be quiet impossible to conceive knowledge without individuals in an organisation (Coleman 1999).

The Social Capital Theory (SCT) establishes the relationship and relevance of individuals in information and knowledge sharing (Nahapiet and Goshal 1998, Adler and Kwon 2002). It effectively highlights the circumstances required for sharing and transmission to take place (Nahapiet and Goshal 1998). Research has also established that social capital is able to motivate individuals to share their expertise within social communities (Wasco and Faraj 2005) or groups (Kanhalli et al. 2005). Social capital is about the importance and value of communication between individuals especially through social networks. It links individuals with common interests and creates enabling platforms for diverse people with a desire for mutual benefits through common practices.

The social capital expert, Robert Putnam (2000:19), surmises it thus:

> Whereas physical capital refers to physical objects and human capital refers to the properties of individuals, social capital refers to connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them. In that sense social capital is closely related to what some have called "civic virtue." The difference is that "social capital" calls attention to the fact that civic

virtue is most powerful when embedded in a sense network of reciprocal social relations. A society of many virtuous but isolated individuals is not necessarily rich in social capital.

The scope and components of SCT are presented in Figure 2.1 below:

Figure 2.1: Social capital framework (adapted from: Halpern, 2005)

The decision to use Halpern's (2005) Social Capital Theory to explain academics' information and knowledge sharing practices was informed by the fact that the theory highlights important issues with respect to the nature and characteristics of individuals, what they tend to contribute, and the benefits that they derive. Significant components of the SCT are discussed below, touching across the following issues:

2.2.1.1 Sense of belonging

Individuals feel more secure when they are surrounded by others who will contribute towards their overall success. In essence, sense of belonging and working side by side builds confidence and boosts their morale (Chow & Chan, 2008).

2.2.1.2 Network

A network provides an enabling platform for communication regardless of geographical or time constraints, bringing people together for participation and the mutual exchange of ideas and innovations (Ritter et al. 2004).

2.2.1.3 Feelings of trust and safety

People who are in the company of others who share common interests and philosophies feel more secure than those who are alone; it assures them less risk. In essence, trust positively influences sharing among individuals (Andrews and Delahay, 2000).

2.2.1.4 Diversity

Diversity is another important aspect of mingling with others. When people of the same profession come together, their individual characteristics and backgrounds add value to the community of practice. Common ideas and perspectives are fine-tuned to pave the way for the emergence of unified standards (Fernandez, et al. 2000).

2.2.1.5 Reciprocity

Individuals are assured of some form of reward in return for their participation and contributions be it information/knowledge, recognition, self-development (Rosenthal, 1997).

2.2.1.6 Values, norms and outlook on life

Those who belong to formal communities of practice and/or networks derive some values and norms from that society that define them as a professional or practitioner. This position defines an individual's outlook on life (Lin, 1999).

2.2.1.7 Power

The participation and contribution of individuals in communities of practice gives them collective power and authority as a group and to practice as members of a formal entity (Jones & Taylor, 2012).

2.2.1.8 Pro-activity and participation

Individuals become more enthusiastic when working together towards achieving a common goal and when they are charged with some responsibilities and tasks to accomplish, thereby contributing to the overall success of the system (Weber & Weber, 2007).

Wang and Noe (2009) reported that many studies have adopted Social Capital and Network Theories to explore the practice of knowledge sharing among different groups and Communities of Practice (CoP). Example include: Widen-Wulff (2007) in “The challenges of knowledge sharing in practice: A social approach”; John, Helliwell and Putnam (2007), “Studying the effect of education on accumulated social capital”; Brand (2009) “The effects and relationship of educational level on civic participation”; and Ashiq, Mahmood and Siraj (2013) “The use and effect of mobile communication on college-going teenagers”.

Despite the importance of this theory, it has been criticised by some researchers (see section 2.3) for being largely focused on the individual contributions of members of a social network in an organisation, while placing less emphasis on the attitudes and characteristics of the individual contributors; the factors influencing their willingness to contribute to organizational efforts; their acceptance or adaptation of the sharing platforms; and technology issues. A more detailed critical appraisal is provided in section 2.3.

The SCT was used in this study to examine and explain the individual approach and contribution of researchers as members of academic institutions and their participation in information and knowledge sharing platforms and networks.

2.2.2 Technology Acceptance Model (TAM)

The application of ICTs facilitates the speedy, remote and timely sharing and transfer of information and knowledge. ICTs tackle different barriers to communication through network and knowledge integration. Technology improves information/knowledge acquisition and sharing by providing the necessary tools to overcome secular and spatial obstacles between individuals and colleagues, and by enhancing accessibility to information and knowledge sources (Hendriks 1999). The term technology is used to refer to all ICTs that are used in relation to the sharing of information and knowledge, which includes information and knowledge management systems in organizations and institutions. These systems are specifically designed to provide the necessary support in the search for, retrieval, processing, storage, dissemination and use of information and knowledge (Alavi and Leidner 2001). Information and communication technologies (ICTs) have become vital resources in organizations and the Technology Acceptance Model (TAM) is very much relevant in the study of their (ICTs') application in Information Science research (Orlikowski and Robey, 1991, DeSanctis and Poole, 1994, Salisbury et al., 2002). The Technology Acceptance Model addresses the inter-relationship and relevance of technology in routine activities, interactions and communication between individuals or members of a group or society. The model is especially interested in people's understanding, adoption and utilization of ICTs in their day-to-day activities.

The TAM focuses on the importance and relevance of modern technological tools for the smooth execution of work based tasks and accords much importance to ICTs in the overall success of individual and/or organizational activities. While the importance of modern technologies cannot be over stated the theory falls short of critically addressing the fact that human beings operate these tools and that an enabling environment is essential for the adoption and utilization of these tools. Hence in this study, the theory was used to support the acceptance and application of modern technologies by academics in their quest to share information and knowledge. The scope and components of the TAM are illustrated and described in Figure 2.2 below:

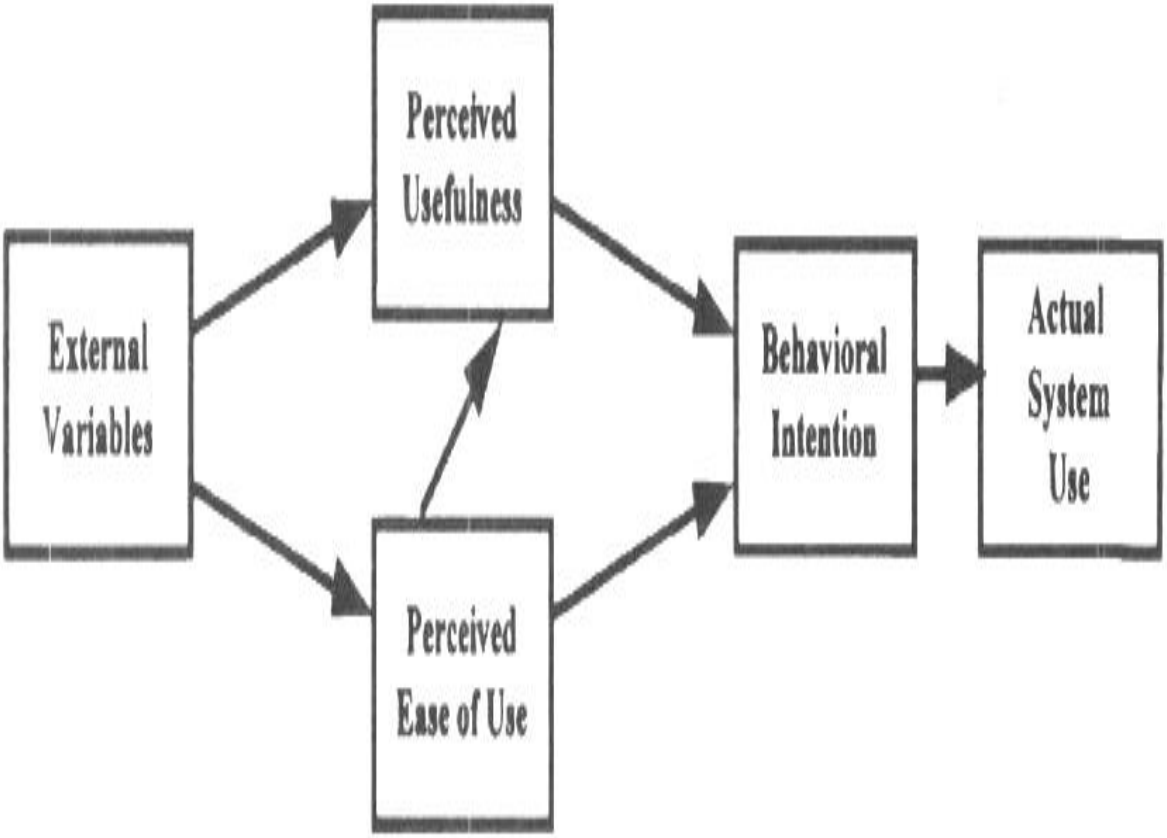


Figure 2.2: Technology Acceptance Model (adapted from Venkatesh & Davis, 1996:453)

The Technology Acceptance Model received more than 700 citations when it was originally proposed by Davis in 1989. The model has since been used in many different ways with notable extensions and contributions by Lee, Kozer and Larsen (2003), Ma and Liu (2004), King and He (2006), and Yousafi, Foxall and Pallister (2007) who studied and analysed the application of TAM in many research areas, and some of the areas studied included Expert support systems, e-government systems, Hospital Information systems, networking etc. and the participants included computer programmers, knowledge workers, medical practitioners, corporate managers, web designers etc. while these studies took place in many countries across the globe such as China, Canada, France, USA, Nigeria, Taiwan and many more. Other studies on various aspects of technology acceptance and use include Lule, Omwansa, and Waema's (2012) study of m-banking adoption in Kenya; Chuttur's, (2009) study on the development and future directions of the TAM use in the USA; Park's (2009) on use of

the TAM to understand university students' behavioural intentions to use e-learning; Neil's (2009) investigation into the adoption rate of cell-phone banking at Stellenbosch University; Osunade, Philips and Ojo's (2007) study of the limitations of knowledge sharing in academia in Nigeria; and Evans's (2014) study of user acceptance of electronic learning at the University of Zululand.

The Technology Acceptance Model was adopted and used in this study to explain the relevance of ICTs in information and knowledge sharing because many important aspects of individuals' behaviour, understanding, and intentions with respect to these tools are evident in academic sharing activities. The TAM critically addresses the issues below with regard to the acceptance, application and use of technology:

2.2.2.1 External variables

While investigating the variables influencing acceptance and use of technology by individuals Compeau & Higgins (2006) posits that external variables are very crucial and need to be addressed before any system is accepted for use. External variables include the training of users, features of the system, specifications and process. This also determines the adaptation of the system.

2.2.2.2 Perceived usefulness

These are the users or participants' perception about the importance and relevance of technologies to their routine activities. Perceived usefulness is the degree to which an individual accepts a technological system based on the systems' ability to supplement or ease their mental and physical efforts (Pearlson & Saunders, 2006).

2.2.2.3 Perceived ease of use

These are the users' perceptions about the ease with which they can use a technology. Some technological systems are very sophisticated and sometimes pose a threat or difficulty to individuals. It is important for users to ascertain whether the equipment is handy to use in their routine operations. This also determines choice, acceptance, preference and ultimately the frequency of usage (Abrami & Barrett, 2005).

2.2.2.4 Behavioural intention

Yi and Hwang (2003) found that behavioural intention to accept and use a particular system is largely influenced by its perceived ease of use and perceived usefulness. These are indicators of the behaviour of the user in accepting and using the system.

2.2.2.5 Actual system use

This is the end result and an indicator of whether the system has been accepted and utilized by the users/participants. It is ideally informed by perceived usefulness and ease of use, leading to behavioural intention and subsequently utilization (Thompson, et al., 2006).

Despite the usefulness of this model, it falls short of extending beyond users' perceived usefulness and ease of use of ICTs, meaning that reasons for the user's perceptions on these points cannot be determined. A more detailed appraisal of the TAM is provided in the critique that follows.

2.3 Appraisal, critique and application of the theories to current study

The Social Capital Theory has been criticized by scholars from a functional-versus interpersonal perspective, and in argument whether social capital initiatives guarantees mutual or personal benefits (Portes, 1998; Sceffler et al., 2008). Furthermore, social capital has been criticized in terms of individual inputs for collaborative participation or for the usefulness of social capital into real practice in community and corporate organisations (Bourdieu 1986; Coleman 1990; Putnam 1993, 1995; Brown et al., 2006). Bourdieu (1986) believes that social capital is largely beneficial to the dominant members of a group, society or organisation for maintaining solidarity and supremacy. He views restrictions in a group or network as an advantage towards maintaining trust, culture, authority and norms hinders wider participation and evaluation etcetera. Other forms of criticism include that social capital it too simplistic and narrow as it undermines the status of individuals in an organisation by regarding them as mere employees (Desjardins, 2003: 11-12). It is also criticised for undermining the capabilities of individuals outside socio-economic and organisational boundaries (Duke, Osborne and Wilson, 2005) and emphasizing learning processes that are perceived to potentially possess reciprocal outcomes only (Kerka 2000; Cruikshank 2008: 67-8).

Those in favour of social capital would point to the fact that Despite the criticisms there is limelight that, one of the benefits of social capital is information and knowledge sharing, and that information and knowledge has great influence on social capital and individual participation (Milligan et al. 2004; Dee, 2004; Wilson, 2000; Jones, 2006). Falk (2001:316) also reveals that social capital has been characterised as the building block of socio-economic advancement. Many researchers have associated social capital with political, social and economic gains, as it has the tendency to increase societal productivity (Westell, 2005:17). Social capital has been used in the study of economic issues in low and middle income countries, although it has not yielded consistent results (Yip et al., 2007; Wang et al., 2009). The World Health Organisation (WHO) also used social capital in the early 2000s in a survey on world health covering 71 countries, which to-date is considered one of the most widely covered surveys showing the influence of social capital on health (CSDH, 2008). Judging from these assertions, social capital can be recognised as a means of bringing people together for enhanced productivity through the exchange of knowledge and cross pollination of ideas. This is why social capital is considered to be the hub of individual and societal cooperation (Grootaert, 1988: iii).

The current study adopted the social capital theory to understand the importance of human interactions and the exchange of expertise and joint efforts in the achievement of common goals.

In academia, common goals may include research, achieving world standards, communicating beyond boundaries and gaining competitive advantage. This and more can be achieved through collaborative efforts and social interactions, such as communities of practice (CoP) in academic and research institutions. This is supported by Saunders (2006:9) who posits that social networks influence and facilitate the acquisition and utilisation of individual expertise. Social capital can facilitate the development of knowledge and expertise through knowledge exchange thereby promoting trust and reciprocal ties.

There are a number of criticisms of the TAM, especially with respect to methodology Legris, Ingham and Collerette, (2003) and Yousafzai, Foxall and Pallister (2007) note the use of individualistic data processing (a subjective measure) to measure systems instead of using data obtained by evaluating system utilization and viability. They argue

that the individualistic data may be insufficient or irrelevant to measuring the reality of system use. Other studies have used participants in a pre-planned set-up, which makes it impossible to generalise in the real sense (Lee, Kozer, & Larsen, 2003). Yang and Yoo (2003) opine that system use is affected by the attitudes of the user, and this is not being addressed in the TAM. Furthermore, the relationships between different constructs in the TAM are poor (Bogazzi, 2007), especially the theoretical strength of the link between intention and actual use. In this sense Bogazzi argues that behaviour is far from being a terminal goal, and should rather be seen as a motive towards enriching vital goals. Here the TAM is deficient in explaining the gap between intention and adoption, where many other factors could come in to play to speed up or delay the decision to adopt. Finally, TAM is considered to be a deterministic model; individuals' actions are largely driven by their intentions.

The TAM was used to understand the acceptance, application, relevance and effectiveness of modern technologies in information and knowledge sharing among academics. This will also provide an indication of the information literacy level of the academics.

Inter and intra-disciplinary ties are a means of facilitating knowledge flow, through the exchange, refinement and transfer of ideas and expertise. In contemporary society, these processes are best achieved through online platforms. Researchers are increasingly exploring the Internet for social benefits in this respect and doing so means that they are more likely to adopt these technologies in their professional capacity. Kumar et al. (2004) asserts that professional networks that were previously maintained through personal contact have now been transformed into virtual communities. This gives technologically driven professionals enormous advantages over those who are not privy to technology (Teten and Allen, 2005; Smallwood, 2006).

Harrison (2006) showed that, the main players in virtual communities of practice occupy a central position. In this context, professional social ties through modern technology yield increased participation, more output, and teamwork and shared responsibilities in practice. This gives members a central focus, and monitored and controlled standards. Studies have also shown that despite the significant investment in educational technology, many of these technologies are being under-utilised (Park, 2009; Teo, 2009; Liu, Liao & Pratt, 2009). The application of the TAM in studies such as this one

has the advantage of determining behavioural intentions to use technology versus actual utilization. There are also more explanations regarding the acceptance of technology in diverse contexts (Sun and Zhang, 2006).

To surmise, the activities in information and knowledge sharing are always mutual so much so that, the individuals (academics in this case) play an important role in performing these functions with the application of their knowledge, expertise and experiences. The latter (knowledge, expertise and experiences), coupled with the willingness to participate and extent of participation, are key to the exchange or cross pollination of ideas and innovations. The necessary and conducive environment (institutions/affiliation) for the execution of academic duties is another crucial aspect, without which the whole process would be impossible as the environment provides the necessary support, incentives, motivation and logistics. Furthermore, information and knowledge sharing can only be hassle-free, timely and effective with the application of the necessary technology (ICTs). The success or otherwise of any process in the 21st century, especially with regard to information and knowledge searching, acquisition, processing, storage and transfer, is strongly based on the adoption, utilization and effectiveness of these tools.

The aggregate of these factors provide the inputs and the required ingredients for the effective sharing of information and knowledge. This study resorted to the use of the Social Capital and Technology Acceptance theories to understand the various complementary factors for effective information and knowledge sharing and to realize set objectives as outlined in Chapter 1.

2.4 Summary

The chapter introduced the theoretical framework as an informed or planned structure developed around theories to guide research. The study adopted the Social Capital Theory and Technology Acceptance Model to understand the sharing of information and knowledge by academics through the use of modern technologies. This is despite a number of criticisms that were presented in the use, relevance and practical application of the theories. The chapter outlined the chosen theories/models, discussed their components in relation to the research topic and justified the theories' relevance to the current study.

Chapter 3 provides a review of literature on information and knowledge sharing.

CHAPTER THREE

LITERATURE REVIEW

3.0 Introduction

One of the crucial stages in a research investigation is the literature review. A literature review provides the researcher with an opportunity to go over a vast amount of literature that is relevant to the problem, theme or topic being addressed. The literature review explores and discusses various authors' ideas and findings in relation to the topic or problem under investigation. A literature review usually constitute a portion of an entire study, be it dissertation or independent study and tries to identify areas explored by others and brings to light the missing gaps justifying the new study (Denney & Tewksburu, 2012:1).

Sambo (2005) states that the literature review positions the topic in relation to previous studies and unveils the focus and perspective of the research in question by:

- Introducing the entire topic based on previous studies
- Exposing the researcher to previous relevant studies
- Developing the researcher's understanding of the scope(depth and breadth) of the area in relation to the research topic
- Exposing other areas relating to the topic that need further study
- Providing the basis for an argument on issues and findings made previously by other researchers
- Exposing the extent to which the topic has been treated and the possible gap to be bridged, which also justifies the current study

Thus, a literature review evaluates and organises quality literature providing the required inputs and solid foundation for clear explanation of the essence of the new research expanding the perspective of the subject area (Levy & Ellis, 2006).

This chapter presents and discusses literature that was relevant to the study. The discussion is divided as follows:

- The concepts of information and knowledge
- Types of information and knowledge sharing
- Reasons for information and knowledge sharing
- Challenges in information and knowledge sharing
- Access and use of academic information and knowledge
- Research collaboration
- Theories of collaboration
- Types of collaboration
- Research collaboration in Africa
- Critique of the reviewed literature in relation to the current study
- Summary

3.1 The concepts of information and knowledge

3.1.1 Information

Aliyu (2007) defines information as a recorded experience that is or can be used in decision making. As alluded to in Chapter 1, Information is that which add to our awareness or understanding of some topic, problem or event and perceived as fact, intelligence, data, news or knowledge. It is therefore a social construct that is all around us and a basic ingredient for human endeavour. Information is the act of informing, it can be thought as the contents of a message that is conveyed and assimilated by person who receives the message (King & Palmoure 1981; Mohammed 2006). Such conveyed information usually results in some decision, action or behavioural change or adds to one's knowledge.

Umar (2009) defines information as “any activity of an individual that is undertaken to identify a message that satisfies a perceived need”. The popular perception of information revolves around the meaning and content conveyed by the information transaction. Information is sought and provided on the assumption that the person receiving it will be better informed. Among the information scientists, information is perceived to be the written or spoken surrogate of knowledge, and the result of data processing (Umar, 2009).

Information is an essential resource for individual growth and for survival. An informed mind is an enriched mind; every rational person needs some form of information for his/her day-to-day existence and well-being. This is why Mohammed (1998) observed that: “There is no doubt in the fact that information is a vital tool for socio-political, economic and cultural development. Its provision in any society for that matter must be based on predetermined techniques of collection, acquisition and organization as a function of identified needs of the audience, choice of the most appropriate medium of communication, the real functions and potentials of the information (recorded and oral) and the level and type of education (formal and informal) of the people”. Okee (2005) observes that information is influential in generating accumulated knowledge, which leads to national development.

3.1.2 Knowledge

As alluded in Chapter 1 knowledge can be implicit/tacit (as technical know-how) or explicit (expressed idea about a subject) (Stanley Cavell, 2002). The study of knowledge is called epistemology. Plato the famous philosopher, defined knowledge as ‘justified true belief’. The acquisition of knowledge encapsulates compound cognitive procedures insight, contact, association and reasoning. It is also strongly associated with the ability of understanding in people (Centenary.edu 2008).

It is generally agreed that the world has moved away from the industrial economy to a position referred to as the Knowledge economy (Walczak, 2005). Sourcing, processing, creating and sharing knowledge have become the primary activities of contemporary society reducing the earlier dependence on the acquisition and maintenance of equipment and machinery. The differentiating factor in the global arena is now utilising the potentials of knowledge rather than production. This also determines the position of

nations in terms of development and categorization (Renzi, 2007). The dynamism of knowledge is certain, in the knowledge economy people need to continuously change and make advances or perish (Van De Lagemaat, 2005). The popular phrase 'knowledge is power' is now overshadowed by the fact that the value of knowledge lies in sharing, and thereby being useful and transforming society (Skyrme, 2001).

The notion that all human beings possess knowledge that is explicit (mostly common to all) and tacit or implicit (individually acquired experiences), brought about radical changes to knowledge management practice (Geisler, 2008). The fact that people acquire knowledge during their day-to-day activities makes them the custodians of their individual experience and know-how, which cannot be retrieved or tapped. Access to this knowledge as 'owned' by individuals is largely dependent on whether a person is willing to share or not. This was first discovered by Polanyi (1966) and extrapolated by Nonaka and Takeuchi (1995). The behaviour of individuals regarding to sharing their tacit knowledge is an issue of discuss and determines the transfer of their expertise (Aliyu 2007; Prusak 1998; Ruggles 1998).

As part of their activities, academics in universities are expected to source, process, produce and transfer knowledge. Academics share common experiences and also possess individual expertise both of which are relevant for sharing with others during lectures, meetings, conferences and research projects. The sharing of these types of knowledge is usually either done consciously or subconsciously.

Different scholars (Baumard, 1999; Malone, 2003; Nonaka, 1994 and Polanyi, 1961) agree with the categorisation of knowledge into tacit and explicit, even though there are question of whether that division exists or not (Polanyi, 1961). The two types of knowledge are intertwined, such that one comes from the other and vice-versa. Explicit knowledge, as a product of implicit knowledge, can be coded, processed, repackaged, edited and transmitted through language, while implicit knowledge, is possessed by individuals and personal in nature.

Polanyi (1961) also suggested that the most important of all types of knowledge is tacit. Nonaka (1994) on the other hand posed the question as to what the possibilities and assurance are that tacit knowledge can be transmitted to another individual or group of people. Howells (1996) and Tsoukas (2003) opined that implicit knowledge is not

transferable, while Chetley and Vincent (2003), Geisler (2008), Nonaka (1994), Polanyi (1961) and Roberts (1998) argue about its transferability. Geisler (2008) further argued that the usefulness of implicit knowledge lies in its measurability, accessibility and sharing otherwise it has no meaning. Other authors (Baumard, 1999; Howells, 1996; Polanyi, 1961; Roberts, 1998; Wong & Radcliffe, 2000) emphasize on the value of people's interactions and socialisation, which are a catalyst for implicit knowledge sharing and transfer. These positions prove that consensus concerning knowledge is yet to be achieved, despite the efforts of various scholars.

As alluded in Chapter 1 Nonaka & Takeuchi, (1995) outlined the four knowledge transfer patterns: implicit to implicit, implicit to explicit, explicit to explicit and explicit to implicit. There is, however, a counter argument by Sun (2002) who suggests that, the development of tacit and explicit knowledge can be done over a period of time between individuals.

In this study, the researcher defined implicit knowledge as a type of knowledge that is possessed by individuals and that can only be identified when a certain action or response triggered from its owner, who may or may not consciously realise the existence of such knowledge in him/her. While explicit knowledge on the other hand is available for all and can be shared easily and is subject to verification and assessment. It is further assumed that the knowledge that individuals possess can be externalised and transformed into a more widely accessible format. The knowledge can then be assimilated by others leading to new opinions and positions based on their different points of view and dispositions i.e. implicit to explicit and vice-versa.

Many writers have stated that knowledge is a derivative of learning (King & Baxter-Magolda, 1996; Malone, 2003; Renzi, 2007). However there is another claim and wider point of view proposed by Chetley and Vincent (2003) that learning does not only involves knowledge acquisition, but rather constitutes many other attributes, such as talent, insight, philosophy, principles, thoughts, behaviour, judgment, intelligence, collective understanding and self-responsiveness. Based on the aforementioned points, it is therefore, believed that probing, attentiveness, testing, questioning, and accomplishment are very vital for the realisation of successful learning. Knowledge is increasingly being identified and appreciated as a product, resource and commodity, a

by-product of learning as a process. In essence, knowledge is useful only when people explore it, apply it, refer to it, accept it, re-examine it, expand it and transform it.

Knowledge is necessary in society to regulate tension, free people from ignorance, and bring them together so that they can participate in programmes that will enhance the development of the society. This emphasizes that knowledge sharing is a crucial aspect of education. Education is the pristine essence of learning, which makes us permanently able and disposed to benefit ourselves and other members of society in the use we make of such learning. It is a cumulative process of the development of intellectual skills, habits, attitudes and values, all of which inform our various outlooks on life.

In our contemporary environment, knowledge can be attained through learning at individual, group, corporate or organisational levels (Huber, 1991; Malone, 2003). People strive hard to improve their knowledge through additional qualifications and efforts, and through formal and informal interactions with others who are superior or more experienced in their field. At group level, individuals who have common dispositions come together in what is now referred to as communities of practice (CoP), a concept first developed by Lave and Wenger (1991), to participate in collective efforts towards achieving a desired goal. Likewise at organisational level, procedures of achieving collective gains are put forward to bring about the sharing of ideas that will ultimately benefit the organisation to function as an entity and for competitive advantages.

3.2 Types of information and knowledge sharing

Sharing information/knowledge through consultation and informal communication is a widely recognized phenomenon in information science literature. Authors such as Amabile et al. (2011) highlight the significance of scholars' communication networks. This indicates the importance of collaboration among researchers to initiate, discuss and refine ideas on divergent problems affecting our society, and to ensure wider participation and understanding of concepts in their fields. Others develop their own theories: Crane (1972) developed the concept of invisible colleges, and showed that the most productive members in these networks have more social ties, influence, and visibility than those who are less productive. Lasker and Weiss (2003); Stoan (1991)

among others, found that the amount of contacts a scholar has with other researchers is the strongest predictor of their publication efficiency, while Boydell and Rugkasa (2007); Sonnenwald and Liewrouw (1997) found that communication behaviour and success in collaboration in project teams correlates positively with perceived individual effectiveness and project performance.

Studies on scholarly information and knowledge seeking have long established that researchers in most fields prefer informal information and knowledge sources and channels over formal sources, mainly because the use of informal sources saves time and energy. Seldén (2001), for instance, found that socially-oriented information and knowledge seeking is typical for senior social scientists that have had long information and knowledge seeking careers and thus accumulated great deal of social capital, while formally-oriented searching is typical of junior researchers with shorter information seeking careers and less social capital. Previous literature on scholars' information and knowledge seeking indicates that information and knowledge sharing is as omnipresent a method of information and knowledge acquisition in academic environments as information and knowledge seeking, and these results in the generation and production of vast literature in scholarly publications across various fields (Barjak, 2006; Erdelez, 1997; Max Planck Institute for psycholinguistics, 2013). Information and knowledge sharing practices have usually been described according to contrasts such as the use of person versus documentary sources, formal versus informal channels, and social versus technical searching. These contrasts seem to be oriented towards explaining why scholars do not always use the document retrieval systems designed to assist them, describing aspects of scholars' information seeking behaviour that are important from the standpoint of information professionals (Fari, 2010).

In information science literature, information and knowledge seeking has mainly been analysed as private effort, although information and knowledge acquisition and filtering can be, and often is, undertaken as a collective and collaborative effort. In contrast research on social networks team collaboration and computer-supported collaborative work (CSCW) is based on theories that have been developed to explain the interaction between different groups. These theories can also be fruitful in information and knowledge sharing research. The aim of CSCW is to assist in designing information and knowledge creation and sharing tools for distinct communities of practice (Van House et

al, 1995). This kind of perspective shifts the focus from individuals to communities of practice or communities of sharing (Rioux, 2000). This would enrich information and knowledge behaviour research. In CSCW, all types of information exchanges are often of equal importance because the aim is to contribute to the creation and dissemination of knowledge. Maron & Smith (2008) surveyed the scholarly communication models in colleges and universities in USA and Canada and reported that nowadays online professional ties through discussion forums and blogs are much more understood and being used for scholarly communication between researchers. This is a result of the convolution of information and knowledge which brings about diversity in research outputs by many scholars in different fields and in different formats adding to the existing modes of publications such as Journals, conference proceeding and books etc. (the European Commission, 2010:25-26; Muriithi, Horner & Pemberton 2013). These include social networks, computer software and mobile communication models among others, hence the need for scholars to adopt the culture of participation in online information and knowledge sharing platforms that facilitate wider coverage, and participation for competitive growth.

There are five types of knowledge sharing as identified by Dixon (2000).

- Serial transfer: transferring of knowledge from experience gained in a situation to a new or similar situation.
- Near transfer: transferring of explicit knowledge from one who is more knowledgeable about a task to another that performs the same task and or working as partners, group.
- Far transfer: involves the transfer from one team to another of tacit knowledge about specific non-routine tasks.
- Strategic transfer: involves transferring very complex knowledge - handling a merger, for example.
- Expert transfer: involves transferring expert knowledge about a specific task that might be done in frequently -answering the 'how do I do this?' question.

The ability of an organisation to acquire and utilise knowledge lies in the capabilities of the individuals in that organisation. It is therefore a prerequisite (Tjepkema et al., 2002) that members of an organisation possess the capacity to:

- Acquire or create new knowledge for the organisation
- Disseminate this knowledge to others within the organisation
- Apply the new knowledge in improved or renewed work practices, products and services

Information and knowledge sharing in the academic research community can take on the following forms:

I. Sharing information and knowledge about relevant documents

II. Sharing relevant documents

III. Sharing information and knowledge about the contents of relevant documents

IV. Sharing information and knowledge about novel and efficient ways of finding relevant documents or information sources

Another useful typology of knowledge sharing is social networking, which emerged in the 21st century. Social networking brings individuals together through a platform that allows them to communicate and share ideas, information and knowledge. The terminology refers to, an organised method through which relationships and ties are developed or embarked upon by individuals with common interests (What is Social Network, 2010). This type of knowledge sharing platform cuts across all strata of society, as it can be used anywhere and anytime by individuals, communities, neighbourhoods, organisations, academic institutions and governments to collaborate and work as a team towards achieving common goals. People create profiles use their bio-data via the intranet to develop and maintain internal social ties with a closed group in the work-place, association, family or business; and the internet for external social ties through divergent network agencies such as MySpace, Facebook, Twitter, LinkedIn, Google scholar etc. The social networks are also used by teachers and academics for lectures and by other members of academic communities to communicate. These networks also provide the opportunity for global participation in knowledge sharing and collaborative initiatives.

Many studies (Ajegbomogun 2007, Maron & Smith 2007) reveal the current trend of embracing the Internet as a modern communication medium. Tim O'Reilly popularized

the idea of ‘Web 2.0’, a term first coined by Darci DiNucci, to describe a web environment that includes Wikis, Weblogs and Syndications (O’Reilly, 2005). The weblog is an online page providing access to brief and sequentially organised pieces of information (Scott, 2002). Web 2.0 has been upgraded to the current ‘Web 3.0’ which enhances participation, coverage and sophistication in the sharing of information and knowledge advantaged due to the emergence of cheaper technologies such as the Android phone and extended Internet provision that more users (including rural users)can afford globally. Other recent studies report the increase in researchers’ participation and use of Web 2.0 for scholarly communication to building new online collaborative ties (Mahapatra, 2010; Procter et al., 2010; Wang, Jiang & Ma, 2010). There has been significant growth in libraries use of social media such as Web 2.0, to communicate with other collaborating libraries and users (Musa, 2005:13). This has allowed the libraries and other information centres to extend their services and cover a larger population of users regardless of time and geographical boundaries.

3.3 Reasons for information and knowledge sharing

In society that is said to be information driven, the success or failure of our day-to-day activities is strongly determined by how informed we are during their execution and this can be improved through sharing. Britz and Ponelis (2012:464) opine that the global flow and sharing of knowledge enhances research and development in all fields and this is facilitated by the interaction and movement of scholars.

Information and knowledge sharing is an activity that forms a significant part of academic’s routine. Hence, the success or failure of any academic or research findings is largely determined by the extent of the researcher’s involvement in gathering and sharing relevant and up-to-date information. This is why Gamble (2002) postulates that if you are able and willing to share with most, if not all, the members of your group, you can be said to occupy a central position in the group. In contrast if you relate to only one person or few people in your group, you occupy a peripheral position. Thus, it is the group’s extent, coverage and pattern of sharing that determines the effectiveness of their interaction. In conjunction with this, Newman (2000) identified a number of interesting properties of information and knowledge sharing, one being that the world of scientific communities is small; there are no barriers regarding time and geographical locations, these properties gives them the advantages of being effective in collaboration

and communication of research results. Communities of practice (CoPs) and professional and inter-disciplinary knowledge sharing platforms (LinkedIn, Library consortia, Web 2.0, 3.0 etc.) are therefore very vital in the acquisition, processing, transfer and sharing of knowledge and expertise among colleagues and for interdisciplinary sharing and research collaboration. Information sharing among professionals especially in the field of science is a desirable element for productivity. This is why scientists in developed countries, as observed by Umar (2009) deliberately establish information sharing networks in order to facilitate their significant breakthroughs and to be productive in the field of science. Aliyu's study found that 90.8% of scientist scholars in Ahmadu Bello University Zaria, Nigeria belong to one or more professional associations.

Reciprocity is another reason for knowledge sharing, where a scientist willingly shares with other colleagues and individuals, especially in service and manufacturing industries (Bouty, 2000; Hippel, 1987; Schrader, 1991). In the software industry, sharing of knowledge is motivated by the compatibility of research output and common interests among developers, which leads to more universal sophisticated products and shared benefits (Oliar and Springman, 2008; O'Mahony, 2003). In contrast, Bouty (2000) reported that a university-based scientist is more likely to share information with another colleague if there is a likelihood of reciprocity in the research results and or benefits to be driven therein.

Walsh et al. (2007) opine that the main reasons behind knowledge sharing between academics and their peers are cost, occupational accomplishments and scientific contest. The authors argued that scientists working in highly competitive fields, especially the life sciences, are usually less likely to disclose or share their knowledge. Gill (2008) supports this notion suggesting that in knowledge sharing, the main considerations are self-centred and perceived benefits. In related studies Heller and Eisenberg (1998) and Rhoten and Powell (2007) pointed out that sponsorship and/or scholarships motivate knowledge sharing between academics and organisations. Other reasons influencing knowledge sharing among scientist includes being acknowledged by others with the hope of gaining popularity and becoming more influential in their fields (Mukherjee & Stern, 2007). Researches have also reported that many individuals and researchers share knowledge for economic and/or social reasons (e.g., Bouty,

2000). The overall discussion emphasizes to the fact that information and knowledge sharing activities are embarked upon by participants due to perceived short term and long term benefits.

3.4 Challenges of information and knowledge sharing

Any group's ability to accomplish a task is directly tied to the interactions between its members. In order to achieve desirable results, it is crucial for members of the academic environment to share with each other and feel free to express their ideas and findings with all members. Sharing gives academics the opportunity to receive feed-back and constructive criticism, avoid duplication of effort, produce quality content and keep up-to-date in their field. Fari (2011) observes that knowledge of what other scientists are doing is also enormously beneficial to stimulating thoughts and provoking new ideas.

Bukland (1988) lists six barriers that need to be overcome to enable information and knowledge sharing. These are;

1. Identification: a suitable source needs to be identified;
2. Availability: the user needs to be able to inspect the source or a copy of it;
3. Price to the user: the toll and trouble of acquiring it must be acceptable to the user;
4. Cost to the provider: what has to be expended by the provider of the information
5. Cognitive access: the sufficient expertise of the enquirer to understand it;
6. Acceptability: the reluctance of the enquirer to accept a particular source as credible.

Each one of the dimensions constitutes a type of barrier to access. Hence each one must be satisfied if access is to be effected.

It is crucial to properly store, retrieve, and make information and knowledge available in usable form for utilization. It is therefore crucial to make information and knowledge available in a usable form. The World Bank Institute's Knowledge for Development Program (World Bank, 2009) reports that access to knowledge is one issue that can only be complimented and validated by the actual use that the knowledge is put into.

This means that unless the right information is shared and applied in the discharge of specific function the whole aim of sharing would be defeated.

Challenges to information and knowledge sharing, especially in Africa, include issues of changes in researchers behaviour, motivation and influence (Mulligan & Mabe, 2011); culture and race (Ford & Chan 2003; Trefry 2006); lack of trust (Ngulube 2005); lack of basic hands-on skills; poor infrastructure and facilities (Fari 2011; Osunade, Philips and Ojo, 2007); negative attitude to knowledge sharing among academics (Aliyu, 2007); and information illiteracy (Umar, 2009). Some of the most significant challenges are discussed below.

3.4.1 Lack of awareness

Information and knowledge seekers and users may not know about the resources that are available. The role of libraries has not always been made clear to information seekers, particularly in developing countries (Association of College and Research Libraries, 2003). Some libraries and librarians have concentrated on traditional resources and services due to lack of support and community engagements to create awareness, which may sometimes be an obstacle to information access and use (Ologbonsaiye, 1994).

Knowledge sharing can only flourish in a society that appreciates the need for it and in an environment where the government recognizes that information is the key to national growth and prosperity. Studies have shown that eve highly-educated individuals lack awareness of the crucial role that information plays (Aboyade, 1982; Aliyu, 2007; Fari, 2010).

3.4.2 Inaccessibility

A library's success depends on the availability of information resources. However it is not enough for the information resources to be available, or even bibliographically accessible, if they are not physically accessible to those who need them. The growth of knowledge, especially in science and technology, has focused attention on the problem of bibliographical or intellectual access to recorded knowledge (Riege, 2005).

There are generally two kinds of failure in library use: stock failure and reader's failure. The former refers to a library's failure to acquire or produce the material that is required by the patron. Reader's failure has two aspects: bibliographical and physical. The bibliographical aspect involves the reader's inability to find the item that they need in the library catalogue. The physical aspect is the failure to locate the materials housed in the library. Failure to physically locate material on the shelves that has been bibliographically identified in the library catalogue is a common frustration and challenge to library management. Some of the reasons for this could be that there is no indication in the library catalogue that an item has been lost, sent to the bindery for repairs, weeded, or stolen; items may have been miss-shelved; and library staff may have removed materials for their private use or that of their relatives, friends, and associates. Other reasons for inaccessibility have been identified by Aguolu and Aguolu (2002) as follows:

- Users do not know precisely what they want and, if they do, they cannot articulate their needs accurately to the library staff.
- The bibliographic or intellectual access to the content of the library is inadequate owing to a poor indexing system in the library catalogue or of the library collection itself.
- The circulation policy of the library is inefficient, shelving methods are inadvertent, and guides to the library arrangement are lacking.
- Unnecessary physical and administrative barriers are imposed upon the use of the library material by library management.
- Users may also not know how to use the library catalogue

3.4.3 Information explosion

The advancement of knowledge is made possible through research in all fields and it has made possible the proliferation of vast amount of literature both in print and electronic formats that are continuously increasing (Mohammed 2006). Mohammed explains that disciplines are broken down into smaller segments as the scholarly literature becomes more specialized. This has increased the volume of information

being produced thereby making it difficult for a user to lay hand on all the publications that exist in their field today. In addition, thousands digital and text-based information packages (e.g., journals, magazines, newspapers, blogs etc.) are being turned out daily by an expanding publishing industry. Uhegbu (2007) agrees that the growth of knowledge is tied to the growing number, size, and diversity of information transfer packages such as books, journals, technical reports, etc. The implication is that, as literature continues to expand, there is a corresponding proliferation of secondary sources, such as indices and abstracts, which are produced to help control the flood of primary literature. Therefore, an information seeker today has difficulty navigating the vast ocean of information, much of which he/she does not need. This as mentioned in chapter one, is the definition of 'information overload'.

The persistence of peer-reviewed journals as a medium of reporting scientific findings, financial investment in research, and constant scientific and technological discoveries have all helped to increase research literature output, but to a level that overwhelms librarians (Britz and Ponelis, 2012; Mohammed 2006; Vanden Hooff and de Ridder, 2004).

3.4.4 Bibliographic obstacles

Bibliographic obstacles includes inadequate bibliographic description and incomplete or incorrect bibliographic description. In many cases, information retrieval devices are lacking or vary in their sophistication and usefulness. Information retrieval devices include indexes, abstracts, OPACs, search engines and search techniques, bibliographies, and catalogues (Aliyu 2007; Mohammed 2006). The objective of these devices is to save the users' time and simplify searching (Banjo, 1984). The researcher also observes that lack of information retrieval devices is more serious in developing countries like Nigeria, where it is a significant obstacle to information access and use, and even when they exist, the bibliographic descriptions lack continuity, are obsolete, and/or do not give a true picture of available current information.

3.4.5 Environment

The principal environmental factors that pose problems include the polluted air in urban and industrialized cities, wide variances in temperature, and pests (Ononogbo, 2002; Ugah, 1993). Ologbonsaiye (1994) identified noise from traffic, other users'

conversations and noise from library staff or equipment as another environmental factor. Uhegbu (2001) includes language and the location of information as environmental factors.

3.4.6 Poor infrastructure

Infrastructure is the basic framework of any information organization. Effective information and knowledge transfer depends on communication facilities such as telephones, Internet access, telex, fax, computers, and even postal services, as well as an adequate supply of electricity.

3.4.7 Declining budgets and rising costs

Faced with declining budgets and increasing demands from users, libraries are finding it increasingly difficult to acquire both primary and secondary publications to meet such demands; global inflation and economic recession have drastically increased the cost of publications; printing and publishing businesses have become extremely capital-intensive, especially in Africa; and many publications have been priced out of the reach of individual subscribers and many libraries, with only large libraries able to afford them, these reduces access to information (Gandhi 2004; Pantry & Griffiths 2003; Singh 2007). Aguolu and Aguolu (2002) also note that, "The high rate of inflation in Nigeria and abroad undermines the acquisition capacity of libraries." Library materials are ordered from countries with a higher standard of living, and prices of books and journals are fixed for societies with higher levels of income. Foreign exchange restrictions, bureaucratic procedures with import licenses, and customs regulations are among other challenges facing libraries.

3.4.8 Costs to users

Users incur a number of costs in their quest to share knowledge or access information. For example they may not be able to afford photocopying Internet access, books, and other necessities. Many users cannot afford to travel from one place to another to obtain information. Information is hard to come by in rural areas, requiring a lot of travel, and the inverse is also true; some information is located in rural areas or abroad, and accessing can be logistically impossible. Most government information sources are

classified ‘secret’ and may require large sums of money to obtain. These and other reasons are considerable obstacles to information access and use.

3.4.9 Staffing

The quality of service provision depends on the quality of staff. Ifidon (1995) found that some library staff lacks a clear perception of their service mission, while Dipeolu (1992) observed that some librarians refused to "soil their hands,” casting themselves as administrators, while secretaries, clerks, and messengers were left to serve library patrons. When professional librarians and other employees fail to make adequate use of their knowledge and skills, access to information is affected.

3.4.10 Crime

Criminal activities such as theft and mutilation of information sources, and assault on staff, are formidable obstacles to information and knowledge sharing (Holt, 2007; Maidabino and Zainab, 2011). Writing on crime and security in libraries, Ameen and Haider (2007); Ratcliff (1992) describe the situation as alarming, not simply because thefts cost money, but also because of their cost to scholarship and recorded knowledge. There has been concern about this issue for some time. Zeiderberg (1987), for example, reported on the crime situation in the US during the 1980s.

3.4.11 International/diplomatic barriers

Access to and the utilisation of knowledge is not only affected by local and national barriers, but also by international barriers especially with respect to African scholars. A common problem is the infringement of individual scholars’ right to attend and participate in international research activities in advanced countries, especially in Europe, America, Canada and Australia. The problems highlighted are considerable with many developed countries imposing restrictive visa requirements on Africans and instances of ill-treatment leading to diminished interest in travelling (Britz and Ponelis, 2012).

3.5 Access and use of information and knowledge

Access to information and knowledge refers to contact with the past and present literature and research carried out in various fields. It is crucial in all aspects of our daily life. Access to knowledge means obtaining the necessary raw data and information

through research reports, peer-reviewed articles, and other relevant original sources for informed decision making. It also refers to the acquisition of necessary information at all levels of education through lectures, discussions, text-books, the Internet, videos, and other reference sources (Berlin Declaration on Open access to knowledge, 2003).

The Treaty on Access to knowledge (2005) itemizes the benefits of access to knowledge as:

- Socially by expanding awareness among community members
- Culturally by extending and promoting access to norms, traditions and encouraging and promoting literacy levels
- Economically through the provision of necessary information and knowledge needed to provoke new innovations for self-reliance

There have been a number of initiatives to support access to knowledge, in particular the Research Council UK which has been at the forefront of the sponsorship of research activities since April 2013, and which requires all funded research to be open for public access (Curry, 2012). The European Union also aims to make at least 60% of their funded research accessible by the public by the year 2016 (Suber, 2012). Others include the Berlin Declaration on Open Access to Knowledge in the Science and Humanities, instituted on 22 October 2003, (http://oa.mpg.de/lang/en-uk/berlin-prozess/berliner-erklarung/); and Treaty on Access to Knowledge, initiated on 9 May 2005 (http://www.cptech.org/a2k/a2k_treaty_may9.pdf). There are also a number of online Open Access initiatives for information and knowledge sharing, such as: Open oasis (http://www.openoasis.org/index.php?option=com_content&view=article&id=137&Itemid=333, Bethelda, IFLA, Budapest etc.) In order to support these initiatives, many universities in the USA, such as Berkley, Yale and MIT, and many other institutions worldwide have made access to a number of their online courses free (Kroes, 2012; Walsh, 2011). Many scholars have recently studied and reported on a number of Open Access initiatives, situations and statuses (Neelie, 2012; Peter, 2012; Stephen, 2005; Taylor, 2011).

Harle (2010) report that the efforts of librarians, couple with a number of information access schemes in Africa have ensured access to wide range of information resources,

though many of which underutilised by users. The growing access to knowledge has largely been possible because of the Internet which provides the following advantages:

- Minimal space for storage and wider access by; breaking geographical barriers to locations and centres.
- Cost effectiveness and convenience, for example by reducing the money spent on printing and storage.
- Universal access and uniform standardisation; commonality and fairness in access (Sample, 2012)

Although, individuals and societies create or generate information independently and collectively, access to information is only achieved when its originators recognise the right of access to it by others, and therefore package it in a form that will ease its accessibility.

Ehikhamenor (2003) observes that although the Internet culture is creating a new scientific communication system with new facilities that are competing with, and might replace, the present printed information sources, scientists are still heavily dependent on printed information sources like journals, indexes and abstracts. Considering the rapid transformation of our environment in the 21st century libraries and information centres need to apply contemporary knowledge management practices to provide enhanced library services (Gandhi, 2004; Pantry & Griffiths, 2003; Singh, 2007). Based on the current knowledge management (KM) theories, knowledge is implicitly embedded in experts' heads and to ensure wider accessibility and usability, it has to be transformed into explicit or recorded form (Jashapara, 2005; Nonaka & Takeuchi, 1995). This means that knowledge is not an end product in itself, but rather a product that can be retrieved, reorganised and transformed to create new knowledge. Thus libraries and information centres need to secure the necessary tools and resources and subscribe to as many databases and other sources as necessary to provide relevant information to their users (Ravi, 2008). In order to maximise access to and the use of information and knowledge, libraries must strategically exploit the advantages of modern technologies to offer joint learning milieus to their clients (Mavodza and Ngulube, 2011).

However, many countries in Africa do not extend their efforts to providing access to knowledge, especially in rural areas, and these are the areas where most of the population resides (Adomi et al., 2003). The problem of access to the right information at the right time has affected many African communities especially in the area of

farming (Ghatak, 2007). This is why Tire (2006) suggested that, in order to enhance agricultural development there is a great need for the constant assessment of the information needs of rural African settlements. Tire stresses that for rural settlements in Africa to be more productive in Agricultural output they need to be availed with the necessary information required for the application of modern farming techniques. This means that there is still a lot to be done in order to ease the problem of access and utilisation of information/knowledge. Despite the millennium advancements of ICTs in universities and other institutions in Africa, there is still a huge divide between African countries and western countries. Even within African sphere there are distinctions across regions and countries with regards to access and use of information (Mutuwa, 2001). The adoption and use of ICTs to increase access to knowledge in Africa is very low (Rosenberg, 1998). Mutuwa (2001) confirms that access to knowledge is limited in Africa due to limited access to ICTs. Lwoga and Ngulube (2008) see a lifeline in the emergence of cheaper ICTs towards promoting access and use of information and knowledge among significant population of Africans. These are already helping to bridge the huge digital divide.

3.6 Research collaboration

In the quest for research excellence, many countries have adopted the policy of research out-put quality evaluation and assessment. A pilot study in 2009 sponsored by OCLC Research, (*A comparative review of research assessment regimes in five countries)* (Key Perspectives, 2009) reported that,

> "As more universities conduct similar evaluations, it is becoming clearer how individual universities are performing compared with others. Universities also pay attention to the world rankings of universities, such as the Academic Ranking of World Universities, compiled by Shanghai Jiao Tong University, and the Times Higher Education World Universities Ranking. This indicates that universities value the ability to measure the quality of their research outputs and to benchmark themselves with universities around the world" (Key Perspectives, 2009).

Researchers seek to affiliate themselves with universities that are highly ranked in research output. Students, especially postgraduates, also seek to be admitted into

universities with a high reputation for research activities and for employment. The quality of graduates and their competence in research have strong influence on their personal and organizational achievements. Institutional, organizational and governmental research administrations are always keen on the research activities of their universities in order to optimize the use of resources and concurrently evaluate their performance in relation to other global competitors.

Moreover, the desire and willingness to collaborate in research among scholars has been reportedly grown especially with the proliferation of modern communication tools (Mulligan & Mabe, 2011). Smith and Katz (2000) connect the growing interest and involvement in collaborative research culture to the following:

- An increase in the understanding of the value of knowledge and the burning desire to strengthen it through research
- A transformation from individualistic to applied collaborative research
- Growing advocacy for shared responsibilities among experts towards achieving better results
- The increase in funding for collaborative research processes and projects
- The desire to expand the provision and access to higher education globally

A number of factors and advantages can be realized through collaborative efforts in research. These include cost reduction, improved efficiency and effectiveness, shared responsibility, wider coverage, and better peer review processes. This is why Rao and Raghavan (2003:230) report that in the area of research and innovation collaboration has become an “inevitable and essential component of every field”. Research collaboration has had numerous interpretations by different scholars depending on the context (Hu & Racherla, 2008; Mathiassen, 2002). A number of researchers have given their views on collaboration such as Haines et al (2010) who sees collaboration as a group of researchers interacting within a small network consisting of individuals from the same institution and others from sister institutions to conduct research and satisfy their quest for information and knowledge; Amabile et al. (2001:419) who describe it as “individuals who differ in notable ways sharing information and working towards a particular purpose”; Jassawalla and Sashittal (1998:239) who define it as “the coming together of diverse interests and people to achieve a common purpose via interactions, information sharing, and coordination of activities”; and Melin and Persson (1996:363)

who have expressed a similar understanding. Collaboration is a “partnership, alliance or network, aimed at a mutually beneficial clearly defined outcome” (Commonwealth of Australia 2004:1). The commonwealth of Australia stresses the importance of communication and the sharing of expertise and assets.

Sonnenwald (2007:645-646) argues about the social perspective of collaborative research and its relevance to research communities. This study argues that, apart from the common goal of collaboration, individuals’ interests and goals are also catered for in collaboration. The three dimensions used to describe collaborative research, as posited by Amabile et al. (2001:419) are: the discipline of the contributors; institutional influence and partnership; and the level of organizational collaborative involvement. Sonnenwald (2007:645-649) adds the professional focus and geographical focus as further dimensions. Collaborative research can occur between individuals from the same organization or from different institutions that may be from different countries or regions of the world. Collaborative research can also be intra or inter-disciplinary; inter-professional collaborations in this view include Amabile et al., 2001; Baba, Shichijo, and Sedita, 2009; Manjarrea-henriquez, Gutirre-garcia and Vega-Jurado, 2009.

Wayne (2006) argues that despite the absence of a global accepted definition of research collaboration, there is a widely accepted and growing recognition of the importance and relevance of collaborative research evidenced in the proliferation and growing number of studies that reveal the growth and viability of research collaborations (Bankole, 2013; Grossman, 2002; Katzen in Johnson, 2011; Leydesdorff & Wagner, 2008; Luukkonen, Persson, & Sivertsen, 1992). These studies have shown the steady increase in number of co-authored papers, even though the papers cut across varying disciplines within research organisations or institutions (Cronin, Shaw, & La Barre, 2004; Newman, 2004; Ocholla, 2011). Research has also revealed that the number of international collaborative studies across disciplines is on the rise, with varying commitment and frequency from different countries (Georghiou, 1998; Leydesdorff & Wagner, 2008; Ocholla, 2011; Procter et al., 2010; Wagner & Leydesdorff, 2005).

Katz and Martin (1997) outline the criteria for categorizing research collaborators as:

- Those who come together to work on a given research project for a given period of time and make regular or considerable inputs.

- The initiators/authors of a particular research proposal
- Those who contribute to one or more stages of a research project such as experimental design, research equipment design, experimentation, and/or data analysis and interpretation
- Those who make crucial contributions to the original idea or theory
- Those who propose the research project or raise funds

However, the authors are of the opinion that, occasional or minor contributors such as research assistants and technicians are not to be regarded as collaborators.

The authors also identify some benefits of collaboration as follows:

- Enables knowledge, skills and techniques sharing
- Promotes knowledge transfer
- Cross fertilization of ideas
- Develop professional ties
- Wider participation and coverage
- Promotes peer review

Despite the benefits of collaboration the authors also highlight the costs of collaboration citing:

- More funding and increased logistics
- More time and administrative strategy
- More geographical, cultural, disciplinary and political barriers to overcome

In the area of informetrics, collaboration is “an instance in which two or more individuals jointly author” (Diadato, 1994:6), also referred to as co-authorship, multiple-authorship or joint authorship.

3.7 Theories of Collaboration

The term ‘collaboration’ is used interchangeably with words like partnership, and has become a popular concept in all areas of life where two or more individuals, organizations, institutions or nations embark upon a mutually agreed process. Sullivan and Skelcher (2002) assert that collaboration provides the opportunity for experts and researchers to partner and fine-tune thoughts and develop strategies for multi-dimensional thinking towards achieving common goals and uniform practice. The most important aspects of collaboration are shared interests, encouragement and objectives. Collaboration brings individuals together who will strive to solve common problems, even though their rationale, expectations and reasons for involvement may differ.

Different projects last for different periods of time, and the level and stage of participation tends to determine the position of each member. However, a project basically undergoes three stages: formative which is the period of conceptualising and contextualising the idea or research to embark upon, production which is the actual action and processes and execution of various tasks as may be required and consumption which is the utilisation of the end results and/or products. Some researchers approach collaboration from the production or consumption standpoint, but in this study, collaboration is regarded to be the engagement of one or more parties in a particular project that aims to achieve a desired outcome, irrespective of the stage at which one of the parties joins. In this case, what matters most is the usefulness of their contribution. The focus of this study was academic partnership in collaborative research projects.

Sullivan and Skelcher (2002) outlined three theoretical viewpoints on collaboration: optimist, pessimist and realist.

3.7.1 The Optimist Viewpoint

The optimist viewpoint places more emphasis on an affirmative and positive direction: the parties involved are regarded to be altruistic individuals with a long term focus on benefits rather than immediate reward (Hanley and Vogel, 2012). It lays down the roadmap for collective efforts towards achieving a common goal for societal development through a mutually agreed initiative that is sustained by partnership rather than a temporary coalition. Therefore, the optimist theoretical viewpoint suggests the

involvement of academics and practitioners striding side by side in mutual and proportioned responsibilities from the beginning (inception and design), through the struggle of sustainability and completion (production), and down to utilizing the end products or services as output (consumption) and beyond. The theory emphasizes that continuity and sustained relationships are crucial aspects and the backbone of a collaborative culture rather than once-off engagement in partnership. This idea emerges from the exchange theory. To surmise, this theory advocates the partnership of different parties involved in carrying out a project aimed at solving a common problem through the implementation of shared responsibility and mutually-oriented initiative for continuous long term benefits. This collaborative initiative can be embarked upon following the invitation of one partner by another with similar interests known as collaborative advancement and the setting of mutually agreed specifications and engagements for the conduct of a project referred to as collaborative empowerment (Himmelman, 1996). This study is basically adopting the optimist viewpoint on collaboration using the Social Capital Theory to investigate the sharing activities among activities in the selected universities for the study, and the Technology Acceptance Model to examine the acceptance and application of ICTs for sharing.

3.7.2 The Pessimist Perspective

The pessimist perspective is the complete opposite of the optimist theory as it views the motive behind collaboration to be the power and dominance of the parties involved (Emerson, in Charles et al., 2012). The theory is derived from the resource dependency theory (RDT). The collaborative norms emphasized in this theory are competitive in nature and the parties involved use their resources and influence to control the other and to manipulate or control their participation (Charles et al. 2012). This theory differs with optimist's theory in the area of the struggle by members to overpower and monopolize or control the activities of their partners. The collaborating parties are basically concerned with a partnership that will maximize their benefits and control, and presume their involvement in any collaborative initiative based on successful benefits.

In his attempt to elaborate more on this theory, Benson (In Charles et al., 2012) observed that every organization has pre-determined objectives to achieve, and work strictly to sustain such benefits for their existence and survival. The motive behind collaborative engagement is not only prompted by the benefits to be derived in terms of

resources and power, but also by the credibility, exposure and continuous future benefits that culminate in experience and a wider network. For this reason, the stimulus for engagement of individuals or organizations in collaborative practice revolves around the idea of sustaining their economy and viable existence, both for the present and the future (Sullivan and Skelcher, 2002:41). Sullivan and Skelcher (2002:41) conclude that this theory views collaboration as an opportunistic venture; collaboration can be embarked upon at any stage of the project in so far as the perceived benefits of influence and resource control are certain.

3.7.3 The Realist Perspective

As the name implies, realist are realistic with regards to their approach; they focus on the prevailing situation as at the time of collaborative project as the basis for making informed decisions about what course of action to follow. Alter and Hage's (1993) evolutionary theory provides a clear understanding of the realist perspective. The idea is that a number of factors influence the viability of a collaborative initiative, such as politics, economy, technological advancements and partners. They believe that experience and adaptation are very crucial in collaboration; it is not a direct action rather it is a practice developing through practice and participation by members (Sullivan and Skelcher, 2002).

The realist perspective is similar to the pessimist perspective in some respect, as while Sullivan and Skelcher (2002) believe collaboration can occur at any stage of a project; they give credit to the organization's decision to participate in a project as a result of changing needs as a result of perceived benefits. The pattern, extent and contribution of the organizational resources towards a collaborative project is influenced by the characteristics and expertise of their partners, consideration of government policies, perceived technology requirements and economic benefits to be derived. The realist perspective emphasizes the fact that an analytic review of the rate of returns, quality of service, donor requests and other factors can lead to the decision to venture into a collaborative project at any stage of the process provided there are clear prospects for benefits/returns.

3.8 Types of Collaboration

A lot of literature has emerged on the typology of research collaboration. Roper (2002) highlights five categories in relating to scope, coverage, originators, and the extent of the involvement of the individuals concerned. Two such typologies, in his view, are the 'expert-consultant model' and the 'expert-trainer model'. In these typologies academics are regarded as role models whose functions are to identify and promote the standard of the organization. Roper explains that the organization's road map is made available to the academics with commissions to critically examine [the road map] for improvement towards attaining the set objectives. The agreement is usually contained in a formal contract. Joint production, learning and sharing of skills and knowledge are not the goals, and neither are shared ideals, significance, and benefits.

The CORE GROUP (2008) categorizes four types of research based on the level of participation of members which makes them partners in collaborative efforts in various levels/ways and these are: operational, formative, summative, and evaluative. They explain that operational research is understood to be continuous, and involves identifying problems encountered and solving them with the sole purpose of improving organizational practice. Formative research deals with behaviour and changing attitudes towards better practice, while summative research largely deals with the measurement of effects. Evaluative research refers to the appraisal of the results of a given action.

Sullivan and Skelcher (2002) critically examined and expanded Thompson's (1996) work highlighting three types of collaboration, namely contracts, networks and partnership. They define a contract as a collaborative initiative that is built on a formal agreement based on a principal-contractor relationship which can be terminated in the event of the violation of contract terms. It is similar to Roper's expert-consultant and expert-trainer models. The network model begins with ordinary relationships driven by willingness, mutual trust and common benefits. These relationships go beyond organizational boundaries and objectives and are more advantageous in terms of individual participation. Unlike the contract or network types, the partnership model spells joint mutual agreement and emphasizes joint decision making, processes and operations (Teisman, 2000:85-6). In this context, all the parties are involved in decision making. Collaboration is regarded as a process of collective initiative, action and execution of an identified task based on a predetermined framework that is aimed

towards achieving a desired objective (e.g. a project, problem solving, business, administration etc.).

3.9 Research collaboration in Africa

Research and development in Africa have suffered tremendous setbacks since the 1960s due to pervasive economic, strategic and partnership issues, and other challenges (Salmi, 2009). Salmi further states that various support groups and initiatives have been created to curtail these problems and reinvigorate research and development and their number are on the rise. The larger support stems from various governments and consortiums of private organizations and foundations (e.g. Rockfeller, Andrew W Mellon, Hewlett, MacArthur, Ford, Kresge Foundations) that are involved in the funding of initiatives such as the Partnership for Higher Education in Africa (PHEA). Many university libraries in Africa are benefitting from the Carnegie Corporation of New York's (CCNY) Higher Education and Libraries in Africa program (http://carnegie.org/programs/higher-education-and-libraries-in-africa/) that is concerned with upgrading and enhancing the capacity of researchers, academic managers and teachers in selected countries; emphasizing the application of information and communication technologies in teaching, learning, research and administration; and establishing academic and public libraries to extend research and information/knowledge access and retrieval to the public.

Despite these efforts it was recorded that only two African countries (Egypt and South Africa) were listed among the top 400 universities in the world by the Times Higher Education World University ranking in 2011 (The World University Rankings, 2010 - 2011). Another effort was made by Thompson Reuters Essential Science Indicators (ESI) to study, analyse and represent the research output of some six African countries from 2001 - 2011 revealing a great disparity in research output. The results are presented in Table 3.1.

Table 3.1 Research output of 6 African countries, Essential Science Indicators (2001 - 2011)

Country	Papers	Number of disciplines (ESI)	Citations	Citations per paper
South Africa	59547	22	504886	8.48
Egypt	40258	21	206217	5.12
Nigeria	14769	20	58652	3.97
Kenya	8400	16	87255	10.39
Uganda	3958	11	38301	9.68
Ghana	3033	10	22500	7.42

The provision of adequate facilities, such as equipment and laboratories; functional libraries with Internet connection facilities; effective searching, processing, storage and retrieval systems; management policies that include remunerations, allowances and rewards for excellence, etc., is very important for the growth and development of research. Other limitations to research productivity in Africa relate to the poor understanding and awareness of the information services for research, and the information literacy skills to and use the research information services available.

The Nairobi Report: *Frameworks for Africa-UK Research collaboration in the Social Sciences and Humanities: African University perspective (2009)* also highlights some areas that need to be addressed in order to revitalize and resuscitate research as follows:

- Provision and accessibility of the Internet and scholarly publications
- Sponsorships and funding
- Supplementary funds to augment on-going research support
- Efficient and effective management structures

A more recent view that was commissioned and published by the British Academy as part of the Nairobi Process, *Foundations for the Future: Supporting the early careers of researchers, African Researchers* (2011), highlights six main areas that require urgent intervention to guarantee a brighter future for upcoming African academics and researchers:

- Opportunities for academics to stay connected with their peers, locally, regionally and internationally through networks and conferences, and through participation in their respective research communities.
- Guidance and support to enable the development of PhD work into publishable form and to secure their first peer-reviewed articles.
- Time and assistance in defining a research agenda, designing new projects, and securing funding to enable it.
- Access to modest seed-funding to build on doctoral work or to explore new ideas
- The ability to supervise future doctoral students of their own in order to contribute to the research base of their departments.
- A supportive institutional context, where the institution and its senior academics seek to enable their progress, encourage research and foster collegiality and mentorship.

The study, African Researchers (2011) further commented on the importance of collaboration: There are clear opportunities, however, and a strong logic, for collaborative mechanisms to support this in the medium term, and longer term to foster continued links between research communities between and within regions. African universities, and their partner universities overseas, have much to gain from stronger links at early career level.

3.10 Summary

This chapter reviewed literature on information and knowledge sharing. Many inputs were reviewed and considered in relation to: information, knowledge, and knowledge sharing in general and in academic institutions in particular; types of knowledge sharing; reasons for knowledge sharing; access and use of knowledge; as well as the challenges to effective knowledge sharing.

There appears to be consensus in the reviewed literature about the importance of knowledge sharing in the overall success of individuals and organisations (Aliyu, 2007; Geisler, 2008; Mohammed, 1998; Nonaka & Takeuchi, 1995; Okee, 2005; Umar, 2009; Walczak, 2007). This confirms the relevance and role of information and knowledge sharing and proves its contribution to education especially to the academic environment and research institutions. The typologies of knowledge sharing were discussed from the point of view of many scholars (Dixon, 2000; O'Reilly, 2005; Rioux, 2000). There was also a discussion of a number of challenges associated with knowledge sharing, especially among academics, such as access and use by the intended clientele, cost of acquiring the information, credibility of the sources, bibliographic obstacles, poor infrastructure, and declining budgets/rising costs. Other obstacles include low technical expertise. The poor attitude to sharing among academics also leads to low research output and less collaborative ties (Lwoga & Ngulube, 2008; Mutuwa 2001; Tire, 2006).

There are many similarities and differences in the reviewed literature in the areas of knowledge sharing and the processes involved, which brought some mixed issues to light. Most researchers based their arguments on contextual rather than generalised views of the concepts of information, knowledge, and information/knowledge sharing. A formal generalised point of view of the concepts is missing in the vast sum of literature. Nevertheless, the current study argues that knowledge sharing enhances research output and leads to the development of collaborative ties. Knowledge sharing also supports the advancement of quality assurance in overall research practices, which is supported by many studies (Rhoten & Powell, 2007; Rioux, 2000; Walsh, 2007). The cited authors also agree that sponsorship and research support motivates knowledge sharing, and academics are more exposed to contemporary practices in their field when they embark on collaborative projects. We should also recognise the contextual framework and objectives of knowledge sharing and how these critically enhance

research output and lead to uniformity, and global standardisation in academic practices, although there may be some disaccord depending on the national and regional policies, vision and mission of the collaborating institutions, and the regional academic culture (Nelson, 2004).

Some of the studies recommend on the needs to improve awareness and support, especially in the area of collaborative ties and incentives from relevant quarters such as the government and the private sector to supplement and augment research funding, which is observed to be lacking in many of African universities. Other studies challenges the current knowledge sharing practices in African universities, suggesting that the poor sharing of knowledge retards the progress of development in our societies and is mostly responsible for the slow growth and poor efficiency of the African economy, social system, and education system, demonstrating the urgent need for academics to develop the idea, willingness and culture of information and knowledge sharing both within and outside their institutions, country and regions, which in no measure assures growth.

Chapter 4 will look at the research methodology of the study.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.0 Introduction

Peritz (in Rochester and Vakkari, 1998:167) defines research as an investigation in which that aims to systematically extract new ideas, facts and concepts. Research constitutes a clear structure of reference and concise formulation of a problem that is connected to and built upon earlier discoveries. It is also a philosophy involving design and methodology (Rajasekar, Philominathan & Chinnathambi 2006). This philosophy, as viewed by Bailey (1987:33), involves postulations and principles that serve as the justification of a study and the standards used in the study for the elucidation of data and arriving at a conclusion. Research can be defined in terms of its components, which include the research plan, research methods, research design, research technique, data collection methods and research instruments, and data analysis.

A research method is the process through which an empirical study or project is executed. For example, this study used qualitative and quantitative research methods. The research design identifies how a study will be carried out, in other words how the research method will be used to address the research questions (Sambo, 2005). A research design is the organization of research that explains what to do, why to do it and how to do it. Kothari (1985:1) defines it as an expedition of finding that follows a well-structured plan as a guide. It is a tactical scaffold for action that serves as a link between research questions and the execution of research (Durrheim, 1999). Research design organises and clarifies variables in a way that enables their relationships to be determined (Nkpa, 1997:40).

A research technique, on the other hand, is approach by which research is undertaken (Willis, 2007:14). For example, a particular study can be undertaken by monitoring the incident happening or by acting in a particular way. This can be put into practice by conducting interviews through any medium of communication or face to face, conducting a survey, or subjecting information or literature to content analysis.

The purpose of this chapter is to describe the research design and methodology of this study. the chapter is structured as follows: research design and methods, the study

population, the sampling method, data collection techniques, the procedure for data collection, and methods of data analysis and interpretation.

4.1 Research design and methods

Osuala (1993) and Roscoe (1969) explain that approaches to social research are diverse, and that the choice of a particular approach is determined by the nature, aims and objectives of the study. This study applied the quantitative research method also known as traditional, empiricist, experimental or the positivist approach, and the qualitative research method also known as the constructivist, interpretive, post-positivist or naturalistic approach. Hesse-Biber (2010) explains that the qualitative method identifies clear evidences as sources of knowledge while the quantitative method captures practical involvements of individuals and groups. Filstead (in Weingand 1993:19) argues in favour of qualitative methodology drawing attention to the fact that this method has had its greatest success in formulating a position that recognises the importance of two perspectives of human behaviour, namely the external (characteristics, identity, status, etc.) and internal (intentions, attitudes, etc.) components. Creswell (1994) defines the qualitative method/approach as an inquiry process of understanding a social or human problem based on building a complex, holistic picture using words and reports that detail the views of participants. In contrast, Leedy (1997) explains that the quantitative method or approach is mainly used to respond to queries about the relationships between measured variables with the sole aim of elucidating, estimating and dictating events. According to Marsland, Wilson, Abeyasekera and Kleih (2000) the quantitative research method is aimed at testing theories, determining facts, statistical analyses, demonstrating relationships between variables, and prediction. Maxwell (2005) deduces that the quantitative approach is used to explain different questions as they have varying strengths and reasons. Examples of data collection methods in quantitative studies include experiments, survey research, content analysis (which can also be qualitative method) and existing statistics. This study used multiple approaches (quantitative and qualitative) to maximize relevant data gathering.

The choice of both qualitative and quantitative methodologies is based on their numerous advantages as observed by Edmonds & Kennedy (2010:146); Mugenda and Mugenda (1999) and Pickard (2007). The authors assert that qualitative and

quantitative methods complement each other in that the qualitative method provides in-depth clarification while the quantitative method provides raw data needed to meet required objectives and to test hypotheses. They further state that using both types of research helps to avoid biases as each method can be used to check the other. For example, the subjectivity that is associated with qualitative research is minimized by the objectivity of quantitative research. Similarly, the researcher found these methodologies to be relevant to the current study due to the fact that information and knowledge sharing requires an in depth understanding through the exploration of data as well as the quantification of information and knowledge sharing processes to understand how frequent they occur among individuals in the academic environment.

This study employed the quantitative method by using a survey questionnaire to determine the strengths and weaknesses of the divergent attitudes and approaches used by academics to explore and participate in knowledge sharing and the effect of their involvement in such practices on their routine work. Furthermore, the four null hypotheses (Ho1, Ho2, Ho3 and Ho4) formulated for the study were tested using the quantitative data obtained from the questionnaire responses (Details provided under section 4.5). This was also supplemented by a Informetric study to uncover salient issues with regards to collaboration among the academics in the selected universities using co-authorship as a measure, and thereby contributing to the overall study in terms of originality and compliance with contemporary issues in collaborative research. The qualitative approach was also used to study the past and present state of knowledge sharing through various literature searches in a bid to understand the concept for comparison and evaluation of the areas under study. This type of combination has been applied by many researchers (see Onyancha and Ocholla, 2009).

4.2 Population of the study

A research population is a group of persons, things or items that is the focus of a systematic enquiry (Saunders et al, 2012). The Oxford Dictionary (1976) defines population as “The total number or quality of things in a given place”. A population stands for the entirety of individuals or organizational elements on which the study problem is measured (Sambo, 2005). Population is therefore the sum total of all the elements in a given area earmarked for study at a given time.

Research is carried out for the benefit of the population that is the focus of the study. It is very important to define the population of a particular study to offer readers a clear understanding of the applicability of the research findings onto the population. There are two types of population in research: the target population, which is the entire population that the study is aimed at, and the accessible population, which is the population that the researcher can reach/access, draw sample to study upon and make conclusions for generalisation.

4.2.1 Target population

The target population for this study was all the academic staff in universities in Nigeria and South Africa.

4.2.2 Delimited population

The delimited population is the portion of the entire research population which the researchers can access due to reasons of convenience or availability, and the population onto which they apply their conclusions for generalization. This population is referred to as a subset of the target population. It is from the identified accessible population that the researcher drew samples for the study. Therefore, the accessible population for this study are all the academic staff in the six selected universities in Nigeria (Ahmadu Bello University (ABU), Federal University of Technology (FUT), and Umaru Musa Yar'adua University (UMYU)) and South Africa (University of KwaZulu-Natal (UKZN), Durban University of Technology (DUT), and University of Zululand (UZ)).

4.3 Sampling methods

This study used both purposive and random sampling to select the required number of universities and to select a sample of the academic staff from the universities. Purposive sampling was used to select the six universities three each from the two countries for the study. The study categorised the universities in each country into three based on their type, that is, Comprehensive, Technological and Others, then among these groups one university was purposely chosen to represent the group, the same procedure was employed in both countries. This was due to the huge differences in the background and the number of universities in the two countries; and also for logistical

reasons, proximity, time and financial constraints. However, necessary measures were followed to ensure that sampling errors were reduced. Sambo (2005) stress that, this type of technique is used when the total population is divided into segments based on a chosen criterion. Proportionate random sampling was used to select the academics from the selected universities in relation to the population of each university. Also, this technique when employed accords an equal chance for members in the accessible population to be selected, thus the law of probability determines which members of the population make up the sample (Saunders et al., 2012). Saunders et al. further stated that when employed regardless of the size of the population (small or large), the errors of sampling can be estimated through which the researcher can have an idea of the level/degree of confidence on their findings.

4.3.1 Sample size

A selected sample size is the intended sample to be used for data collection in a study while the final sample size is usually less than the selected sample size due to non-response, invalidity or both (Sambo, 2005). The study used 10% of the delimited population of academic staff from each university. Questionnaires were distributed to the academic staff as they are approached at their respective faculties using the population data earlier obtain from the different university's MIS or calendar. The sample size is in line with Boll and Gall's (as cited by Adetoro in Afolabi, 1993) assertion that a sample size of 10% from population is enough to ensure the representation of the population. A common misconception in social science research is that if the population is large, then the sample must also be large to provide fair representation, (Ngulube 2005; O'sullivan et al. 2008). Also in another study by Nkpa (as cited by Opaleke, 2012) stated that 5% is applicable where the population runs in the thousands. This study therefore considered the sample size of 10% as reasonable enough to augment the effect and reliability of the study.

Table 4.1: Sampling of academics in the selected universities in Nigeria and South Africa

S/N	University	Type	Population	Sample(10%)	Country
1	Ahmadu Bello University Zaria	Comprehensive	1744*	174	Nigeria
2	Federal University of Technology Minna	Technology	638*	64	Nigeria
3	Umar Musa Yar'adua University	Other	427*	43	Nigeria
4	University of Kwazulu-Natal	Comprehensive	422**	42	South Africa
5	Durban University of Technology	Technology	268**	27	South Africa
6	University of Zululand	Other	322*	32	South Africa
	TOTAL		**3821**	**382**	

Note: (*) data obtained from the University MIS office
(**) data obtained from the university calendar

4.4 Data collection

The choice of research instruments for data collection is largely influenced by the type of research (quantitative, qualitative or both) and research questions of a study (qualitative or quantitative responses). As alluded to earlier, this study employed survey questionnaire to gather data from academics, used Informetric analysis to measure collaboration (quantitative) and sieve through various literature available to generally understand the concepts of information and knowledge sharing and collaboration (qualitative) for informed contribution and addition to the raw data obtained.

4.4.1 Questionnaire

A questionnaire is a research tool that consists of a variety of questions that are used for the collection of data concerning a specific issue (Sambo, 2005). The questionnaire was administered in English as this is the common language of instruction in both Nigeria and South Africa. Questionnaire was chosen because it facilitates uniform data collection from a large number of respondents who are spread over a large area within the shortest possible time (du Plooy, 2009). The questionnaire also provides room for comparative interpretation and varying administrative procedure, offers freedom and flexibility to the respondents and is fairly cost-effectiveness. The questionnaire was developed with particular reference to contemporary standards in information and knowledge sharing and focuses on information literacy skills that reflect the acceptance and use of information and communication technologies (ICTs) by the academics.

The instrument consisted of nine (9) sections:

- Section A Bio-data;
- Section B Information and knowledge sharing;
- Section C Reasons for sharing;
- Section D Patterns of sharing;
- Section E Extent of sharing;
- Section F ICT usage for sharing;
- Section G Problems associated with sharing;
- Section H Suggestions for effective sharing;
- Section I Effects of sharing.

The questionnaire was distributed to academics with a cover letter that briefly explained the purpose and significance of the study attached to each copy. The questionnaire also included relevant instructions that included the time of collection of the completed questionnaire. The respondents were given between two to five days to fill in the questionnaires. The estimated time for the researcher to administer the questionnaires to the academics in both countries was 4 weeks each, and an additional one week each was used for a follow-up in some cases due to unforeseen circumstances. Many of the respondents filled in and handed back the questionnaires instantly, while others were collected at a later time as specified. There was no problem noted with regards to understanding the content because the respondents were learned individuals and the arrangement was self-explanatory. The overall exercise was successful, especially with

the use of research assistants who were researchers in their own right and capable of handling such task; A total of 281 questionnaires were distributed in Nigeria and a return of 219 representing 77.9% while a total of 101 questionnaire were distributed in South Africa and a return of 92 representing 91.1% these figures gave a total of 382 administered questionnaires and a return of 311 representing 81.4% in both countries.

4.4.2 Informetric analysis

Ocholla (2003) emphasizes the importance and effectiveness of using informetrics to analyse research collaboration and knowledge sharing trends. Publication co-authorship in journals, books, conferences, etc., is often used as a research collaboration indicator. Katz and Martin (1997) list the four major advantages of using the co-authorship technique to measure collaboration as: availability of data, simplified measurement, and verifiability and reliability over a period of time. Many researchers have used co-authorship to analyse collaboration in informetric studies, including Hartinah, Davis, Hydari and Kent, (2001:227), who studied the collaboration pattern in an Indonesian nutrition research paper; Osareh and Wilson (2001), who studied the growth and development of collaborative scientific research articles in Iran between 1985 and 1999; and Onyancha and Ocholla's (2004) comparative study on HIV/AIDS literature in Kenya and Uganda.

Co-authorship has also been used to measure the pattern of research collaboration by Yoshikane and Kageura (2003), Wang, Wu, Pan, and Ma (2003) and Persson, Glazel and Danell (2003). Based on the above, and more recent studies by Ye, Li and Law (2011) who studied co-authorship network analysis of tourism and hospitality research collaboration; Yu, Shao and Duan (2012) who studied research collaboration in Chinese cardiography and cardiovasology, it is apparent that co-authorship has been used and still remains the preferred method of collaborative research study and analysis.

The publication data for this study was obtained from SCOPUS database using the six selected universities' affiliation search strategy. The database was accessed through the University of Zululand library. The data consisted of all the publications in SCOPUS co-authored between academics from the six universities for the period of 2003 to 2013, this period was selected to obtain the latest collaborative trend from the universities and was done in 2014. Other reasons for choosing this period was to capture as many

article as possible undertaken within the period of the study as some may not have been published until 2014 the searching and filtering was done in the months of October and November of 2014.

This data was used to uncover the collaborative patterns. The number of authors for each article was used to determine the nature of the collaboration and the institutional affiliation. A clear analysis of the nationality of the authors provided more details about international collaborative partners and the publication frequency. The analysis of the collaborative research in the two countries covered all the fields and subjects available in the sampled institutions on the SCOPUS database. Combining the selected universities during searching provided the data for collaboration between academics in the same university (within), with other academics from universities in the same country (among), and between any two or more universities from the two countries (beyond).

More explanations are provided under each heading of the collaboration data obtained including trend, strength of association, collaborative co-efficient and the relationship between research collaboration and knowledge sharing index in chapter six.

4.5 Data analysis

The data was organised for analysis by coding the quantitative raw data for easy manipulation using the appropriate statistical software. The Statistical Package for Social Sciences (SPSS) was used to present, analyse and determine the outcome in relation to the quantitative data that emanated from the research questionnaire. Frequency tables, simple percentages were used in representing the data. Inferential statistics was also used to analyse and interpret the data using the hypotheses formulated for the study. There were four null hypotheses, and each one was tested using a two tailed test calculated at 0.05 level of significance. The first and second null hypotheses were tested using a T-test while the third and fourth were tested using correlation. The level of significance of 0.05 or 95% confidence interval was used, which is generally accepted for behavioural research involving humans. The hypotheses were tested with regards to the type of information shared; reasons for sharing; pattern of sharing and effects of sharing. These areas were considered vital in identifying the differences and similarities in the sharing practices between academics in the selected universities in Nigeria and South Africa, which was also the main aim of the study.

Leedy and Ormrod (2005) stated that T-test looks for differences among three or more averages/means by comparing the variances both within and across groups. Ho3 and Ho4 were tested using PPMC to establish the correlation/relationship between variables.

4.6 Reliability and validity of the research instruments

The questionnaire that was developed for this study was examined by supervisors, colleagues and research experts to ascertain its construct, face, and content validity. This was necessary to ensure that the content and construct of the questionnaire was in line with the ability and experience of the respondents.

Furthermore, the items in the questionnaire were subject to the test of reliability using the split–half method. This method randomly splits the data set into two and a score for each participant is then calculated based on each half of the scale. If a scale is very reliable a person's score on one half of the scale should be the same (or similar) to their score on the other half (Sambo 2005). Thus, several participants' scores from the two halves of the questionnaire should correlate perfectly (or very highly). The correlation between the two halves is the value computed in the split-half method, with large correlations being a sign of reliability using Cronbach's alpha, which is the most common measure of scale of reliability.

Leedy and Ormrod (2005) recommend that a researcher may sometimes need to conduct a brief exploratory investigation or pilot study to try out particular procedures, measurement instruments, or methods of analysis. The authors explain that a pilot study is an excellent way to determine the feasibility of a study. The pilot study specifically determines the clarity of instructions; the time taken to complete the questionnaire; and the clarity and appropriateness of the questions. For this purpose a pilot study was conducted involving 10 academics each sampled from one university selected in Nigeria and South Africa respectively.

4.7 Problems encountered

Limitations are usually encountered at any point during research process and this study was not an exception. The limitations during research could be internal: due to research design, methodology and or the nature of the instruments for data gathering/collection among other issues but these could be controlled and minimized by the researcher under the guidance of supervisors, for example a research proposal had to be written and defended which took time and led to changes in the original topic to specifically address the problem to be investigated; the sampling technic to be adopted to accommodate varying characteristics of the population involved from two different countries with different university set up and background etc., or it could be external: due to factors beyond the researchers control such as politics, travel, economy, time, respondents attitudes, institutional policy for example travelling between the two countries for data collection was inconveniencing and time consuming; getting the exact population of academics by department and faculty from all the sampled universities in Nigeria and South Africa was tasking, in some cases we had to resort to using the figures available on the universities' calendar which is an official document of the institutions; the required sample of respondents in South African universities were difficult to contact within the time scheduled for the field exercise extending to about three times the period proposed, also in Nigeria the academic staff union of universities were holding nationwide strike during the exercise leading to delay and additional cost of movement and logistics to the researcher.

The other problem encountered was downloading, filtering, processing and analysing of data from the SCOPUS database, using the advanced search strategy by the universities names and affiliation which took time, energy and the technicality involved in arriving at the specific number of publications (single-authored and co-authored), identifying the authors, universities, and types of publication and areas of collaboration within, between and beyond the selected universities.

4.8 Dissemination of research

Some of the findings of this study were disseminated through journal article publication, local and international conference and workshop and through thesis to be posted on Unizulu IR. The findings were discussed with supervisors, colleagues, and other academics. The following conference papers were presented:

- Fari SA (2013) Information and knowledge sharing among academics in Umaru Musa Yar'adua University, Nigeria and University of Zululand, South Africa. 15th LIASSA conference, 7 – 11 October, Cape Town.
- Fari SA and Ocholla DN (2015) Nature, Patterns and Trends of Research Collaboration among Academics in Selected Universities in Nigeria and South Africa. PROLISSA conference 11-13 March, Pretoria

4.9 Summary

This chapter described the research methodology, and data collection methods and analysis of this study. Quantitative data was collected using a structured questionnaire from academics in the selected universities in the two countries under study. Data was subsequently organized through coding and analysis using descriptive statistics. The chapter also highlighted the processes used to test the four null hypotheses of the study and the research collaboration data obtain from the database (SCOPUS).

Chapter 5 presents the analysis of the data collected from the questionnaire.

CHAPTER FIVE

DATA PRESENTATION AND ANALYSIS

5.0 Introduction

This chapter deals with the presentation and analysis of data collected using a questionnaire that was administered to academic in selected universities in Nigeria and South Africa. The chapter is organized as follows:

- Response rate by university and country
- Demographic characteristics of the respondents
- Responses on information and knowledge sharing
- Summary.

5.1 Response rate by university and country

Table 5.1 below presents the questionnaire distribution and response rate from the six universities. The number of respondents selected from each university was based on a 10% sample size. The total sample consisted of 382 (281 from Nigeria and 101 from South Africa) academics. Of the total administered questionnaires 311 (219 from Nigeria and 92 from South Africa) were returned. The lowest response rate was from Nigeria and the highest from South Africa.

Table 5.1: Response rate by university and country

Country	University	Administered	Returned	Percentage
Nigeria	ABU	174	123	70.7
	FUT	64	56	87.5
	UMYU	43	40	93.0
	Total	281	219	77.9
South Africa	DUT	27	24	88.9
	UKZN	42	37	88.1
	UZ	32	31	96.9
	Total	101	92	91.1

5.2 Demographic characteristics of the respondents

5.2.1 Gender of the respondents

The respondents' gender is presented in Table 5.2.

Table 5.2: Gender of the respondents

Country	University	Male		Female	
		Frequency	Percentage	Frequency	Percentage
Nigeria	ABU	84	38.4	39	17.8
	FUT	43	19.6	13	5.9
	UMYU	35	16.0	5	2.3
	Total	162	74.0	57	26.0
South Africa	DUT	17	18.5	7	7.6
	UKZN	21	22.8	16	17.4
	UZ	27	29.3	4	4.3
	Total	65	70.7	27	29.3

162 (74%) of the respondents from the selected Nigerian universities were male while 57(26%) were female. Respondents from South Africa constituted 65 (70.7%) males, and 27 (29.3%) females, meaning that the trend of more male respondents was uniform across both countries

5.2.2 Disciplines of the respondents

The respondents' disciplines otherwise referred to as fields of expertise are presented in Table 5.3 below.

Table 5.3: Disciplines of the respondents

Disciplines	Nigeria		South Africa	
	Frequency	Percentage	Frequency	Percentage
Humanities	125	57.1	38	41.3
Natural Sciences	61	27.9	29	31.5
Applied Sciences	33	15.1	25	27.2
Total	219	100.0	92	100.0

There appears to be a similarity in the population trend across disciplines in the selected universities in both countries, for example the number of respondents from the Humanities was larger in both countries, in Nigeria it was 125 (57.1%) and in South Africa it was 38 (41.3%) and likewise the fewest respondents from both countries were from the Applied Sciences, it was 33 (15.1%) in Nigeria and 25 (27.2%) in South Africa, there was also a similar trend in the Natural Sciences, which fell in the middle category with 61 (27.9%) respondents from Nigeria and 29 (31.5%) respondents from South Africa.

5.2.3 Educational qualifications of the respondents

The educational qualifications of the respondents are presented in Table 5.4.

Table 5.4: Highest educational qualifications of the respondents

Highest educational qualification	Nigeria		South Africa	
	Frequency	Percentage	Frequency	Percentage
PhD	66	30.1	39	42.4
Masters	115	52.5	47	51.1
Bachelor	38	17.4	6	6.5
Total	219	100.0	92	100.0

The majority of respondents from the selected universities in both countries had Master's Degrees with 115 (52.5%) from Nigeria and 47 (51.1%) from South Africa followed by PhDs with 66 (30.1%) from Nigeria and 39 (42.4%) from South Africa. This trend augurs well with the quality of teaching and research in selected universities in both countries because the majority of academics were at their most productive educational level.

5.2.4 Years of experience of the respondents

The number of years of experience of the respondents is presented in Table 5.5.

Table 5.5: Years of experience of the respondents

Years of experience	Nigeria		South Africa	
	Frequency	Percentage	Frequency	Percentage
<10years	53	24.2	16	17.4
11-20years	92	42.0	49	53.3
21-30years	58	26.5	24	26.1
Above 30years	16	7.3	3	3.3
Total	219	100.0	92	100.0

The majority of the respondents from the universities in Nigeria had 11 to 20 years 92 (42%) of experience, followed by 21 to 30 years 58 (26.5%), while 53 (24.2%) had less than 11years of experience and only 16 (7.3%) had over 30 years' experience.

There were slightly more South African respondents with 11 to 20 years of experience 49 (53.3%), followed by 21 to 30 years of experience 24 (26.1%), while 16 (17.4%) had less than 11 years' experience and only 3 (3.3%) had over 30 years of experience.

5.3 Responses on information and knowledge sharing

This section addresses the following research questions:

1. Do the academics share information and knowledge?
2. What type of information and knowledge do the academics share?
3. Why do the academics share information and knowledge?
4. How do the academics share information and knowledge?
5. How often do the academics share information and knowledge?
6. What information and communication technologies (ICTs) do the academics use for information and knowledge sharing?
7. How does information and knowledge sharing affect the academics in teaching, research, and self-development and community service?
8. What are the challenges to effective academic information and knowledge sharing?
9. What are the possible solutions to the identified problems?

5.3.1 Sharing Information and knowledge

The respondents were asked to indicate if they shared information and knowledge. The question was divided into two different but related queries: understanding the concept of information and knowledge sharing; and participation in information and knowledge sharing.

5.3.1.1 Understanding the concept of information and knowledge sharing

All the respondents from the selected universities in Nigeria (219; 100%) and South Africa (92; 100%) revealed that they understood the concept of information and knowledge sharing.

5.3.1.2 Participation in information and knowledge sharing

The second part of the question aimed to ascertain whether the academics participate in information and knowledge sharing. All the respondents from the Nigerian universities (219; 100%) and South African universities (92; 100%) indicated that they participated in information and knowledge sharing.

The affirmative response to this question allowed the researcher to proceed to establish the academics' patterns, preference, and tools in their routine information and sharing activities and the problems encountered, if any.

5.3.2 Types of information and knowledge shared

Respondents were provided with a list of different types of information and knowledge, and were asked to indicate the degree to which they were shared (‘very much’, ‘much’, ‘less’, ‘never’, or whether they were ‘undecided’) and (‘very much’, ‘much’, ‘less’) where then combined to determine the aggregate percentage of sharing as presented in Table 5.6.

Table 5.6: Types of information and Knowledge shared

Types of information shared	Country	Very Much	Much	Less	Never	Undecided	% shared
Information on conferences, workshops and seminars	NG	96(43.8)	80(36.5)	43(19.6)	0(0.0)	0(0.0)	100
	SA	69(75)	23(25)	0(0.0)	0(0.0)	0(0.0)	100
Information on scholarship availability	NG	40(18.3)	55(25.1)	24(11)	67(30.6)	33(15.1)	54.4
	SA	29(31.5)	19(20.7)	21(22.8)	0(0.0)	23(25.0)	75
Information on part-time, visiting and sabbatical jobs	NG	84(38.4)	68(31.1)	37(16.9)	30(13.7)	0(0.0)	86.3
	SA	0(0.0)	0(0.0)	8(8.7)	39(42.4)	45(48.9)	8.7
Information on teaching methods/class management	NG	35(16)	32(14.6)	61(27.9)	0(0.0)	91(41.6)	58.4
	SA	19(20.7)	15(16.3)	6(6.5)	0(0.0)	52(56.5)	43.5
Information on new technologies	NG	97(44.3)	85(38.8)	37(16.9)	0(0.0)	0(0.0)	100
	SA	69(75)	23(25)	0(0.0)	0(0.0)	0(0.0)	100
Information on current/on-going researches	NG	39(17.8)	46(21)	91(41.6)	0(0.0)	43(19.6)	80.4
	SA	87(94.6)	5(5.4)	0(0.0)	0(0.0)	0(0.0)	100
Information on communal activities	NG	53(24.2)	39(17.8)	88(40.2)	29(13.2)	11(5)	81.8
	SA	11(12)	9(9.8)	5(5.4)	31(33.7)	36(39.1)	27.2
Research supervision	NG	98(44.7)	52(23.7)	16(7.3)	40(18.3)	13(5.9)	75.8
	SA	49(53.3)	35(38)	8(8.7)	0(0.0)	0(0.0)	100
Research collaboration	NG	64(29.2)	58(26.5)	73(33.3)	0(0.0)	24(11)	89
	SA	47(51.1)	45(48.9)	0(0.0)	0(0.0)	0(0.0)	100
Research students mentoring	NG	94(42.9)	63(28.8)	38(17.4)	9(4.1)	15(6.8)	89.1
	SA	46(50)	37(40.2)	9(9.8)	0(0.0)	0(0.0)	100

All of respondents from the selected Nigerian universities (100%) indicated that they shared information and knowledge on conferences, workshops and seminars. The same applied to the academics (100%) from the South African universities; Information on scholarship availability was shared by more respondents from the South African universities (75%) than Nigerian universities (54%). This suggests that academics in South African universities are keener on scholarship/funding for their teaching and research than their Nigerian counterparts. Information on part-time, visiting and sabbatical jobs was also shared by a majority (86.3%) of the respondents from Nigeria, but distinctly less (8.7%) by South African respondents. The South Africans also shared less information on teaching methods/class management (43.5%) than the Nigerian respondents (58.4%). Information on new technologies was highly shared by all the academics in both countries (100%), and information on current/on-going research was shared by a majority of the respondents in both Nigerian (80.4%) and South African (100%) universities. The Nigerian respondents shared more information and knowledge on community engagements (81.8%) than their South African (27.2%) counterparts. 75.8% and 100% of the respondents from Nigeria and South Africa respectively indicated that they shared information on research supervision, suggesting that, research supervision is highly regarded. The majority of the respondents from both Nigeria (89.1%) and South Africa (100%) also indicated that they shared information on research students mentoring and research collaboration (89% Nigeria, 100% South Africa). This type of information is directly related to research supervision. Notably, there is significant similarity in the types of information and knowledge shared by respondents in both countries. The most glaring exception was information on part-time, visiting and sabbatical jobs, which was largely shared by the Nigerian respondents.

The data obtained on the types of information and knowledge shared among academics was further subjected to a T-test to test the first null hypothesis (Ho1) of this study which reads: *There is no significant difference in the type of information and knowledge shared among academics in the selected universities in Nigeria and South Africa*. The calculated t-value of 1.011 was obtained, and the value of P = 0.313 was found to be greater than $\alpha = 0.05$. Therefore, the null hypothesis was accepted, with the conclusion that there is no significant difference in the type of information and knowledge shared among academics in the selected universities in Nigeria and South Africa.

The results of the null hypothesis tested are presented in Table 5.7 below.

Table 5.7: T-test results for differences in the type of information/knowledge shared

Variables	Country	N	Mean	Std. Deviation	Std. Error	t-value	DF	P	Remarks
Types of information	Nigeria	219	3.6142	1.10014	.07434	1.011	309	.313	NS
	South Africa	92	3.7402	.72066	.07513				

5.3.2.1 Types of information/knowledge preferred

It is assumed that the type of information and knowledge that is shared would be different to the type of information and knowledge that is preferred to receive by the respondents. Further to their indication on the types of information and knowledge they shared, the respondents were also asked to reveal their level preference (‘very much’, ‘much’, ‘less’, ‘never’, ‘undecided’) and (‘very much’, ‘much’, ‘less’) where then combined to determine the aggregate percentage of preference and the results are presented in Table 8 below.

Table 5.8: Types of information and knowledge preferred

Types of information preferred	Country	Very Much	Much	Less	Never	Undecided	% Preferred
Information on conferences, workshops and seminars	NG	89(40.6)	87(39.7)	36(16.4)	0(0.0)	7(3.2)	96.8
	SA	77(83.7)	15(16.3)	0(0.0)	0(0.0)	0(0.0)	100
Information on scholarship availability	NG	48(21.9)	50(22.8)	21(9.6)	54(24.7)	46(21.0)	54.3
	SA	9(9.8)	19(20.7)	35(38)	3(3.3)	26(28.3)	68.4
Information on part-time, visiting and sabbatical jobs	NG	85(38.8)	52(23.7)	55(25.1)	0(0.0)	27(12.3)	87.7
	SA	0(0.0)	0(0.0)	5(5.4)	45(48.9)	42(45.7)	5.4
Information on teaching methods/class management	NG	26(11.9)	29(13.2)	59(26.9)	7(3.2)	98(44.7)	52.3
	SA	17(18.5)	14(15.2)	5(5.4)	0(0.0)	56(60.9)	39.1
Information on new technologies	NG	93(42.5)	85(38.8)	41(18.7)	0(0.0)	0(0.0)	100
	SA	68(73.9)	24(26.1)	0(0.0)	0(0.0)	0(0.0)	100
Information on current/on-going researches	NG	43(19.6)	77(35.2)	39(17.8)	0(0.0)	60(27.4)	72.6
	SA	83(90.2)	9(9.8)	0(0.0)	0(0.0)	0(0.0)	100
Information on Communal activities	NG	58(26.5)	34(15.5)	95(43.4)	24(11)	9(4.1)	84.9
	SA	9(9.8)	10(10.9)	7(7.6)	29(31.5)	37(40.2)	28.3
Research supervision	NG	95(43.4)	61(27.9)	11(5)	38(17.4)	14(6.4)	76.2
	SA	87(94.6)	5(5.4)	0(0.0)	0(0.0)	0(0.0)	100
Research collaboration	NG	74(33.8)	63(28.8)	54(24.7)	0(0.0)	28(12.8)	87.2
	SA	53(57.6)	39(42.4)	0(0.0)	0(0.0)	0(0.0)	100
Research students mentoring	NG	98(44.7)	64(29.2)	33(15.1)	19(8.7)	5(2.3)	89
	SA	69(75)	23(25)	0(0.0)	0(0.0)	0(0.0)	100

The majority of respondents indicated the type of information and knowledge they preferred to have shared with them was information/knowledge on new technologies (100% Nigeria; 100% South Africa) and conferences, workshops and seminars (96.8% Nigeria; 100% South Africa). There could be a link between sharing information on conferences, workshops and seminars with the requirement to publish by the academics, as academic publications emanate from conferences and/or seminar presentations. A strong correlation was observed between the type of information shared and the information that is preferred.

5.3.3 Reasons for information and knowledge sharing

The respondents were asked why they shared information. They were provided with a list of reasons, and could indicate the degree to which they agreed with each statement (‘strongly agree’, ‘agree’, ‘less agree’, ‘do not agree’, ‘undecided’) and (‘strongly agree’, ‘agree’, ‘less agree’) where then combined to determine the aggregate percentage agree. Results are presented in Table 5.9 below.

Table 5.9: Reasons for information and knowledge sharing

Reasons	Country	Strongly Agree	Agree	Less Agree	Do not Agree	Undecide	% Agree
To avoid duplication of effort	NG	79(36.1)	81(37)	35(16)	23(10.5)	1(0.5)	89
	SA	53(57.6)	29(31.5)	10(10.9)	0(0.0)	0(0.0)	100
To be current in my discipline	NG	67(30.6)	59(26.9)	42(19.2)	39(17.8)	11(5.0)	77.2
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
To become popular among colleagues	NG	65(29.7)	74(33.8)	47(21.5)	26(11.9)	7(3.2)	84.9
	SA	49(53.3)	37(40.2)	6(6.5)	0(0.0)	0(0.0)	100
To be familiar with others in my field	NG	59(26.9)	66(30.1)	27(12.3)	47(21.5)	20(9.1)	69.4
	SA	47(51.1)	32(34.8)	13(14.1)	0(0.0)	0(0.0)	100
To improve collaboration	NG	73(33.3)	64(29.2)	34(15.5)	21(9.6)	27(12.3)	78.1
	SA	38(41.3)	54(58.7)	0(0.0)	0(0.0)	0(0.0)	100
To uncover new ideas	NG	67(30.6)	59(26.9)	68(31.1)	0(0.0)	25(11.4)	88.6
	SA	89(96.7)	3(3.3)	0(0.0)	0(0.0)	0(0.0)	100
To strengthen academic culture	NG	69(31.5)	75(34.2)	39(17.8)	9(4.1)	27(12.3)	83.6
	SA	41(44.6)	51(55.4)	0(0.0)	0(0.0)	0(0.0)	100
To foster unity among academics	NG	67(30.6)	74(33.8)	36(16.4)	21(9.6)	21(9.6)	80.8
	SA	39(42.4)	53(57.6)	0(0.0)	0(0.0)	0(0.0)	100
To improve research output	NG	87(39.7)	64(29.2)	55(25.1)	0(0.0)	13(5.9)	94.1
	SA	53(57.6)	39(42.4)	0(0.0)	0(0.0)	0(0.0)	100
To support research activities	NG	89(40.6)	87(39.7)	24(11)	0(0.0)	19(8.7)	91.3
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
To enable sharing	NG	92(42)	97(44.3)	30(13.7)	0(0.0)	0(0.0)	100
	SA	79(85.9)	13(14.1)	0(0.0)	0(0.0)	0(0.0)	100
To enable free flow of information	NG	39(17.8)	46(21)	99(45.2)	16(7.3)	19(8.7)	84
	SA	67(72.8)	25(27.2)	0(0.0)	0(0.0)	0(0.0)	100

Topping the list of reasons for information and knowledge sharing in Table 5.9 are: to enable information and knowledge sharing (100% Nigeria; 100% South Africa), to support research activities (91.3% Nigeria; 100% South Africa) research support (91.3% Nigeria; 100% South Africa) and avoiding duplication of efforts (89% Nigeria; 100% South Africa).

There were significant differences in sharing information and knowledge to be familiar with others in my field (69.4% Nigeria: 100% South Africa), to avoid duplication of efforts (89% Nigeria; 100% South Africa) and to become popular among colleagues (84.9% Nigeria; 100% South Africa). Other reasons for knowledge sharing include enabling the free flow of information and knowledge (84% Nigeria; 100% South Africa), and to be current in my discipline (77.2% Nigeria; 100% South Africa), to be current in their discipline (77.2% Nigeria; 100% South Africa), improving collaboration (78% Nigeria; 100%) South Africa), uncovering new ideas (88.6% Nigeria; 100% South Africa), strengthening academic culture (83.6% Nigeria; 100% South Africa) and popularity among colleagues (84.9% Nigeria; 100% South Africa).

The data on reasons for information/knowledge sharing was further subjected to test for the null hypothesis two (Ho2) which reads: *There is no significant difference in the reasons for information and knowledge sharing among academics in the selected universities in Nigeria and South Africa*.

The calculated t-value was 7.580 and the obtained value of P 0.000 is less than α=0.05. Therefore, the null hypothesis is rejected and the conclusion is that, there is significant difference in the reasons for information/knowledge sharing among academics in Nigeria and South Africa. The hypothesis test proves that there are significant differences in the reasons for sharing among academics in the selected universities in the two countries.

The results are presented in Table 10 below.

Table 5.10: T-test results for difference in the reasons for information and knowledge sharing

Variables	Country	N	Mean	Std. Deviation	Std. Error	t-value	DF	P	Remarks
Reasons for Sharing	Nigeria	219	3.7504	1.10970	.07499	7.580	308	.000	Sig
	South Africa	91	4.6511	.35222	.03692				

5.3.4 Patterns of information and knowledge sharing

In this study, patterns of information and knowledge sharing refer to avenues for routine communication, information seeking, and the exchange of ideas among the academics in the study areas.

The ways and patterns through which the academics share information and knowledge were provided and respondents had to indicate whether they ‘strongly agreed’, ‘agreed’, ‘agreed less’, ‘did not agree’ or were ‘undecided’ about each item and (‘strongly agree’, ‘agree’, ‘less agree’ where then combined to determine the aggregate percentage of agreed. The results are presented in Table 5.11 below.

Table 5.11: Patterns of information and knowledge sharing

Patterns for information sharing	Country	Strongly Agree	Agree	Less Agree	Do not Agree	Undecided	% Agree
Participating in joint publication	NG	39(17.8)	48(21.9)	54(24.7)	41(18.7)	37(16.9)	64.4
	SA	69(75)	23(25)	0(0.0)	0(0.0)	0(0.0)	100
With academics in my field	NG	49(22.4)	86(39.3)	47(21.5)	31(14.2)	7(3.2)	82.6
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
With academics in my institution	NG	56(25.6)	68(31.1)	49(22.4)	31(14.2)	15(6.8)	79
	SA	57(62)	17(18.5)	18(19.6)	0(0.0)	0(0.0)	100
With academics in my country	NG	53(24.2)	57(26)	63(28.8)	27(12.3)	19(8.7)	79
	SA	26(28.3)	34(37)	19(20.7)	0(0.0)	13(14.1)	85.9
Through professional memberships	NG	57(26)	65(29.7)	48(21.9)	40(18.3)	9(4.1)	77.6
	SA	37(40.2)	25(27.2)	13(14.1)	0(0.0)	17(18.5)	81.4
During Seminars, conferences and workshops	NG	86(39.3)	94(42.9)	25(11.4)	0(0.0)	14(6.4)	93.6
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100

The majority of the respondents from the selected universities in Nigeria (64.4%) and South Africa (100%) indicated that they shared information through participation in joint publication (64.4%) and (100%) which spells collaboration. The majority of respondents also shared information with others in the same area of specialisation (82.6% Nigeria and 100% South Africa) and, with academics within their institutions (79% Nigeria and 100% South Africa), suggesting strong intra-institutional collaboration between colleagues in the same institution but from different fields. They also indicated that they

shared information and knowledge with academics in their countries (79% Nigeria and (85.9% South Africa), suggesting that the respondents in both countries were sharing information with academics in other universities, which translates into inter-institutional collaboration.

The majority of respondents from both countries (77.6% Nigeria; 81.4% South Africa) also indicated that they shared information through professional membership. The encouragement of professionalism in Africa, especially in academia, has led to the promulgation of professional associations and communities of practice. Academics subscribe to their professional bodies to promote understanding, research, and peer review practices and the respondents in the two countries under study attested to being part of these practices. The majority of respondents stated that they shared information and knowledge during seminars, workshops and conferences; during seminars, workshops and conferences (93.6% Nigeria; 100%South Africa). Through such platforms academics share knowledge and communicate research results, and in doing so promote academic excellence, individual growth and professionalism.

The patterns of sharing are in accordance with the types of information shared and the type of information preferred in previous questions, which indicates consistency and affirms the respondents' positions. The South African respondents scored higher percentages across all the sharing patterns.

The data obtained from the questionnaire was subjected to a Pearson rho correlation to test the third null hypothesis (Ho3), which reads: *There is no significant relationship in the pattern of information and knowledge sharing among academics in the selected universities in Nigeria and South Africa*.

As revealed in the table, the rho value calculated was 6.823 and the P value is 0.000 which is less than $\alpha = 0.05$. Therefore, the null hypothesis was rejected which means that there is a positive correlation in terms of pattern of sharing among academics in the selected universities from Nigeria and South Africa. The patterns of information and knowledge sharing among academics in the selected universities in Nigeria and South Africa are significantly related.

Table 5.12 below provides the test results.

Table 5.12: Sharing patterns among academics in Nigeria and South Africa

Variables	Country	N	Mean	Std. Deviation	Std. Error	r-calc.	DF	P	Remarks
Sharing patterns	Nigeria	219	3.5540	1.13657	.07680	6.823	309	.000	Sig
	South Africa	92	4.4149	.63788	.06650				

5.3.5 Extent of information and knowledge sharing

The degree of information and knowledge sharing ('most often' 'often', 'less often', 'never; or 'undecided') was requested from the respondents and 'most often' 'often', 'less often' where then combined to determine the aggregate percentage of oftenest, and the results obtained are presented in Table 5.13 below.

Table 5.13: Extent of participation in information and knowledge sharing

Extent of participation	Country	Most Often	Often	Less often	Never	Undecided	% Often
With colleagues	NG	61(27.9)	53(24.2)	61(27.9)	29(13.2)	15(6.8)	80
	SA	77(83.7)	15(16.3)	0(0.0)	0(0.0)	0(0.0)	100
Through personal discussions	NG	47(21.5)	86(39.3)	55(25.1)	6(2.7)	28(12.8)	84.5
	SA	77(83.7)	15(16.3)	0(0.0)	0(0.0)	0(0.0)	100
At conferences, seminars and workshops	NG	87(39.7)	93(42.5)	30(13.7)	0(0.0)	9(4.1)	95.9
	SA	85(92.4)	7(7.6)	0(0.0)	0(0.0)	0(0.0)	100
Inform my colleagues before undertaking any research	NG	38(17.4)	31(14.2)	67(30.6)	65(29.7)	18(8.2)	62.3
	SA	29(31.5)	37(40.2)	5(5.4)	0(0.0)	21(22.8)	77.2
Inform my colleagues on my research progress	NG	21(9.6)	37(16.9)	45(20.5)	80(36.5)	37(16.9)	46.6
	SA	43(46.7)	28(30.4)	11(12)	0(0.0)	10(10.9)	89.1
With colleagues in my discipline only	NG	23(10.5)	65(29.7)	74(33.8)	53(24.2)	4(1.8)	74
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
Concerning my field with those outside it	NG	12(5.5)	33(15.1)	27(12.3)	87(39.7)	60(27.4)	32.9
	SA	19(20.7)	21(22.8)	29(31.5)	17(18.5)	6(6.5)	75

The respondents from the selected universities in Nigeria and South Africa indicated that they often shared information and knowledge with colleagues (80% Nigeria; 100% South Africa); through personal discussions (84.5% Nigeria; 100% South Africa); at conferences, seminars and workshops (95.9% Nigeria 100% South Africa). A lesser percentage of the respondents indicated that they informed colleagues before

undertaking any research (62.3% Nigeria; 77.2% South Africa). 46.5% of the Nigerian respondents in contrast to 89.1% of the South African respondents indicated that they informed colleagues on their research progress. 74% of the Nigerian respondents and all100% of the South African respondents often share with colleagues in their discipline only while 32.9% of the Nigerian respondents and 75% of the South Africans shared information concerning their discipline with colleagues outside their field.

This corresponds with their reasons and patterns of sharing with colleagues in their field. It is evident that the majority of the respondents from Nigeria were not sharing information about their field with others outside their professional network in contrast to their South African colleagues.

5.3.5.1 Frequency of information and knowledge sharing

Table 5.14 below reveals responses on the sharing frequency (‘most frequent’, ‘frequent’, ‘less frequent’, ‘never’ or ‘undecided’) and ‘most frequent’, ‘frequent’, ‘less frequent’ where then combined to determine the aggregate percentage of sharing frequency of the respondents from the selected universities.

Table 5.14: Frequency of information and knowledge sharing

Frequency of Sharing	Country	Most frequent	Frequent	Less frequent	Never	Undecided	% frequent
Conference, workshops & seminars	NG	54(24.7)	97(44.3)	38(17.4)	13(5.9)	17(7.8)	86.3
	SA	59(64.1)	33(35.9)	0(0.0)	0(0.0)	0(0.0)	100
Information on scholarships	NG	15(6.8)	19(8.7)	68(31.1)	85(38.8)	32(14.6)	46.6
	SA	5(5.4)	11(12)	6(6.5)	29(31.5)	41(44.6)	23.9
Information on additional jobs	NG	68(31.1)	79(36.1)	51(23.3)	21(9.6)	0(0.0)	90.4
	SA	17(18.5)	13(14.1)	3(3.3)	53(57.6)	6(6.5)	35.9
Information on teaching methods	NG	29(13.2)	53(24.2)	59(26.9)	68(31.1)	10(4.6)	64.4
	SA	39(42.4)	27(29.3)	26(28.3)	0(0.0)	0(0.0)	100
Information on new technologies	NG	58(26.5)	98(44.7)	39(17.8)	0(0.0)	24(11.0)	89
	SA	37(40.2)	25(27.2)	19(20.7)	0(0.0)	11(12.0)	88
Current and on-going research	NG	49(22.4)	98(44.7)	32(14.6)	18(8.2)	23(10.5)	81.3
	SA	44(47.8)	27(29.3)	21(22.8)	0(0.0)	0(0.0)	100
Research supervision	NG	41(18.7)	95(43.4)	28(12.8)	17(7.8)	38(17.4)	74.8
	SA	55(59.8)	37(40.2)	0(0.0)	0(0.0)	0(0.0)	100
Research collaboration	NG	91(41.6)	67(30.6)	36(16.4)	0(0.0)	25(11.4)	88.6
	SA	39(42.4)	28(30.4)	10(10.9)	0(0.0)	15(16.3)	83.7
Students mentoring	NG	88(40.2)	64(29.2)	48(21.9)	0(0.0)	19(8.7)	91.3
	SA	56(60.9)	36(39.1)	0(0.0)	0(0.0)	0(0.0)	100

The highest number of respondents from both Nigeria and South Africa indicated that they frequently shared information and knowledge on students' mentoring (91.3% Nigeria; 100% South Africa). The academics' frequent sharing of this type of information is related to current and on-going research (81.3% Nigeria; 100% South Africa) and research supervision (74.8% Nigeria; 100% South Africa). Students' mentoring also refers to counselling and career guidance in general, which are very crucial in guiding students based on their fields of interest. The respondents also frequently shared information on conferences, workshops and seminars (86.3% Nigeria; 100% South Africa). This suggests that all the respondents frequently attended academic gatherings for information and knowledge sharing. Information on scholarship availability was rarely shared by the Nigeria (46.6%) and South African (23.9%) respondents. The respondents from Nigeria were also significantly keener about information on additional jobs (90.4%) compared to their South African counterparts (35.9%). Information on teaching methods/class management was shared by more South African (100%) than Nigerian (64.4%); Information on new technologies was frequently shared by both sets of respondents (89% Nigeria; 88% South Africa); Research collaboration was also shared by the majority of the respondents from Nigeria (88.6%) and South Africa (83.7%)

5.3.6 Types of ICTs used for information and knowledge sharing?

The respondents were also asked to indicate their use ('very much', 'much', 'less', 'never' or 'undecided') and 'very much', 'much', 'less' where then combined to determine the aggregate percentage of use of the different ICTs for information and knowledge sharing. The results are presented in Table 5.15 below.

Table 5.15: Types of ICTs used for information and knowledge sharing

Type of ICTs	Country	Very Much	Much	Less	Never	Undecided	% use
Computers	NG	99(45.2)	87(39.7)	23(10.5)	0(0.0)	0(0.0)	100
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
Mobile Phones	NG	98(44.7)	99(45.2)	22(10)	0(0.0)	0(0.0)	100
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
Social media	NG	76(34.7)	59(26.9)	56(25.6)	15(6.8)	13(5.9)	87.3
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
Fax machine	NG	0(0.0)	0(0.0)	5(2.3)	119(54.3)	95(43.4)	2.3
	SA	13(14.1)	11(12)	17(18.5)	40(43.5)	11(12.0)	44.6
Radio	NG	58(26.5)	53(24.2)	69(31.5)	0(0.0)	30(13.7)	86.3
	SA	13(14.1)	11(12)	39(42.4)	8(8.7)	21(22.8)	68.5
Television	NG	68(31.1)	86(39.3)	39(17.8)	0(0.0)	26(11.9)	88.1
	SA	37(40.2)	25(27.2)	19(20.7)	0(0.0)	11(12.0)	88
Digital Camera/Photos	NG	37(16.9)	45(20.5)	95(43.4)	29(13.2)	12(5.5)	81.3
	SA	9(9.8)	17(18.5)	23(25)	21(22.8)	22(23.9)	53.7
Internet facilities	NG	98(44.7)	97(44.3)	24(11)	0(0.0)	0(0.0)	100
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
CD-ROMs	Nigeria	47(21.5)	49(22.4)	97(44.3)	9(4.1)	17(7.8)	88.1
	SA	7(7.6)	11(12)	4(4.3)	11(12)	59(64.1)	23.9
USB Drive	Nigeria	89(40.6)	88(40.2)	42(19.2)	0(0.0)	0(0.0)	100
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
Teleconferencing	Nigeria	0(0.0)	0(0.0)	38(17.4)	98(44.7)	83(37.9)	17.4
	SA	21(22.8)	30(32.6)	23(25)	17(18.5)	1(1.1)	80.4
Videoconferencing	Nigeria	0(0.0)	0(0.0)	29(13.3)	98(44.7)	92(42.0)	13.3
	SA	17(18.5)	27(29.3)	15(16.3)	32(34.8)	1(1.1)	64.1

There was full (100%) compliance with the use of computers, mobile phones, internet facilities and USB drives for information and knowledge sharing by respondents in both countries. The fax machine had very low utilization (2.3% Nigeria; 44.6% South Africa), suggesting that faxing is becoming obsolete. Many of the respondents indicated that they used the radio (86.3% Nigeria; 68.5% South Africa) and television (88.1% Nigeria; 88% South Africa) for information and knowledge sharing. Less of the South African (57.7%) than the Nigerian (81.3%) respondents indicated that they used digital cameras and photos. CD-ROMs were used by the majority (88.1%) of the Nigerian respondents and only (23.9%) of the South African respondents. The Nigerian respondents rarely used teleconferencing and videoconferencing (17.4% and 13.3% respectively), in contrast to the South African respondents (80.4% and 64.1% respectively).

5.3.6.1 Frequency of ICT usage for information and knowledge sharing

The respondents were asked to indicate the frequency with which they used ICTs for information and knowledge sharing. The results are presented in Table 5.16 below.

Table 5.16: Frequency of ICT usage for information and knowledge sharing

ICTs usage	Country	Most frequent	Frequent	Less Frequent	Not at all	Undecided	% frequent
Computers	NG	96(43.8)	90(41.1)	23(10.5)	0(0.0)	0(0.0)	100
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
Mobile phones	NG	98(44.7)	89(40.6)	32(14.6)	0(0.0)	0(0.0)	100
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
Social media	NG	71(32.4)	57(26)	59(26.9)	0(0.0)	32(14.6)	85.4
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
Fax machine	NG	0(0.0)	0(0.0)	3(1.4)	121(55.3)	95(43.4)	1.4
	SA	4(4.3)	7(7.6)	5(5.4)	49(53.3)	27(29.3)	17.3
Radio	NG	55(25.1)	59(26.9)	71(32.4)	0(0.0)	34(15.5)	84.5
	SA	11(12)	7(7.6)	43(46.7)	13(14.1)	18(19.6)	66.3
Television	NG	65(29.7)	91(41.6)	44(20.1)	0(0.0)	19(8.7)	91.3
	SA	35(38)	24(26.1)	23(25)	0(0.0)	10(10.9)	89.1
Digital	NG	37(16.9)	41(18.7)	93(42.5)	31(14.2)	17(7.8)	78
Camera/Photos	SA	7(7.6)	9(9.8)	28(30.4)	21(22.8)	27(29.3)	47.9
Internet	NG	96(43.8)	94(42.9)	29(13.2)	0(0.0)	0(0.0)	100
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
CD-ROMs	NG	48(21.9)	47(21.5)	99(45.2)	7(3.2)	18(8.2)	88.6
	SA	7(7.6)	9(9.8)	7(7.6)	11(12)	58(63.0)	25
USB Drive	NG	87(39.7)	91(41.6)	41(18.7)	0(0.0)	0(0.0)	100
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
Teleconferencing	NG	0(0.0)	0(0.0)	36(16.4)	99(45.2)	84(38.4)	16.4
	SA	21(22.8)	30(32.6)	23(25)	17(18.5)	1(1.1)	80.4
Videoconferencing	NG	0(0.0)	0(0.0)	27(12.3)	99(45.2)	93(42.5)	12.3
	SA	17(18.5)	27(29.3)	15(16.3)	32(34.8)	1(1.1)	64.1

The frequency of usage of ICTs by the academics corresponds with their earlier responses concerning the types used. 100% of the respondents from the selected

Nigerian and South African universities indicated that they frequently used computers; mobile phones; the internet and USB drives. The fax machine (1.4% Nigeria and 17.3% South Africa) was the least used ICT. There were varying frequencies of use of digital cameras and photos (78% Nigeria and 47.9% South Africa); CD-ROMs (88.6% Nigeria and 25% South Africa); teleconferencing (16.4% Nigeria and 80.4% South Africa); video conferencing (12.3% Nigeria and 64.1% South Africa). The last two types of ICTs were rarely used in Nigeria.

5.3.7 Effects of information and knowledge sharing on teaching, research, self-development and community service.

This section sought to investigate the effects of information and knowledge sharing on teaching, research, self-development and community service among academics in selected universities in Nigeria and South Africa. In each case, respondents had to indicate the degree of the effect (‘very much’, ‘much’, ‘less affect’, ‘do not affect’ or ‘undecided’) and (‘very much’, ‘much’ and ‘less affect’) were then combined to determine the aggregate percentage of the effect. The data obtained is presented in Tables 5.17 to 5.20 below.

5.3.7.1 Effect of information and knowledge sharing on teaching

Table 5.17: Effect of information and Knowledge sharing on teaching

Effect of information sharing on teaching	Country	Very much	Much	Less Affect	Do Not Affect	Undecided	% Affect
A reliable source for lecture notes	NG	0(0.0)	66(30.1)	101(46.1)	43(19.6)	9(4.1)	76.3
	SA	0(0.0)	0(0.0)	21(22.8)	71(77.2)	0(0.0)	22.8
I get relevant materials for my lecture	NG	2(0.9)	69(31.5)	97(44.3)	43(19.6)	8(3.7)	76.7
	SA	0(0.0)	0(0.0)	19(20.7)	73(79.3)	0(0.0)	20.7
Influences my method of teaching	NG	0(0.0)	3(1.4)	48(21.9)	149(68)	19(8.7)	23.3
	SA	43(46.7)	32(34.8)	5(5.4)	0(0.0)	12(13.0)	87
A guidance in assessing students	NG	0(0.0)	0(0.0)	0(0.0)	201(91.8)	18(8.2)	0
	SA	0(0.0)	0(0.0)	0(0.0)	92(100)	0(0.0)	0
Allow others to evaluate my class	NG	0(0.0)	0(0.0)	0(0.0)	198(90.4)	21(9.6)	0
	SA	0(0.0)	0(0.0)	0(0.0)	92(100)	0(0.0)	0

The respondents from the selected Nigerian and South African universities had varied responses to the effect of information and knowledge sharing on their teaching 76% of the respondents from the selected Nigerian universities indicated that sharing was a reliable source of input for preparing lecture notes, while only 22.8% of the South African respondents indicated the same. I get relevant materials for my lectures' was

also a more notable effect among the Nigerian respondents (76.7%Nigeria; 20.7% South Africa). In contrast, only 20.7% of the Nigerian respondents as opposed to 87% of the South African respondents indicated that sharing influenced their method of teaching. None of the respondents from either country indicated that information and knowledge sharing contributed towards ‘guidance in assessing my students’ (0% Nigeria; 0% South Africa) and ‘allowing others to evaluate my lectures’ (0% Nigeria; 0% South Africa).

5.3.7.2 Effects of information and knowledge sharing on research

The respondents were asked to indicate whether information and knowledge sharing had an effect on their research activities, and their responses are presented in Table 5.18 as follows.

Table 5.18: Effects of information and knowledge sharing on research

Effect of information sharing on research	Country	Very much	Much	Less Affect	Do Not Affect	Undecided	% Affect
Access to information for my research	NG	45(20.5)	39(17.8)	35(16)	89(40.6)	11(5.0)	54.4
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
Awareness about on-going research	NG	0(0.0)	49(22.4)	31(14.2)	125(57.1)	14(6.4)	36.5
	SA	34(37)	25(27.2)	12(13)	0(0.0)	21(22.8)	77.2
Obtaining relevant input from colleagues	NG	43(19.6)	42(19.2)	31(14.2)	93(42.5)	10(4.6)	52.9
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
It is a motivating factor for my research	NG	29(13.2)	37(16.9)	73(33.3)	80(36.5)	0(0.0)	100
	SA	57(62)	35(38)	0(0.0)	0(0.0)	0(0.0)	100
Means of publicizing research findings	NG	219(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100

54.4% of the respondents from Nigeria and 100% from South Africa believed that sharing enables access to relevant information for their research. Responses to awareness about on-going research were (36.5% Nigeria; 77.2% South Africa). Respondents from the selected universities in both countries indicated that they

consulted their colleagues for input (52.9% Nigeria; 100% South Africa), but significantly more South Africans felt that this was the case. All the respondents from both countries (100% Nigeria; 100% South Africa) indicated that sharing motivates their research activities. This corresponds with the high response recorded concerning the academics' participation in sharing and preference for these types of information and knowledge.

5.3.7.3 Effects of information and knowledge sharing on self-development

Table 5.19 below presents the data obtained about the effects of sharing on self-development.

Table 5.19: Effects of information and knowledge sharing on self-development

Effect of information sharing on Self development	Country	Very much	Much	Less Affect	Do Not Affect	Undecided	% Affect
Acquire information relevant to my field	NG	27(12.3)	36(16.4)	41(18.7)	103(47)	12(5.5)	47.5
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
A means of keeping abreast of knowledge	NG	52(23.7)	41(18.7)	126(57.5)	0(0.0)	0(0.0)	100
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
Enhanced productivity	NG	85(38.8)	79(36.1)	33(15.1)	0(0.0)	22(10.0)	90
	SA	67(72.8)	25(27.2)	0(0.0)	0(0.0)	0(0.0)	100
More exposure	NG	71(32.4)	87(39.7)	19(8.7)	0(0.0)	42(19.2)	80.8
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
Wider collaboration	NG	69(31.5)	85(38.8)	0(0.0)	0(0.0)	65(29.7)	70.3
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100

47.5% of the Nigerian respondents and 100% of the South African respondents indicated that sharing helped them to acquire information relevant to their field. Sharing is a means of keeping abreast of knowledge (100% Nigeria; 100% South Africa). Sharing was also believed to, enhance productivity (90% Nigeria; 100% South Africa). Majority were also optimistic that more exposure is attained through sharing of information (80.8% Nigeria; 100% South Africa). 'Wider collaboration' received a lesser score among the Nigerian respondents (70.3% Nigeria; 100% South African).

Information and knowledge sharing had a significant effect on self-development of the respondents in both countries. The only notable exception was the Nigerian respondents' opinions on acquiring information relevant to their field.

5.3.7.4 Effects of information and knowledge sharing on community service

The data obtained about the effects of sharing on community development are presented in Table 5.20 below.

Table 5.20: Effects of Information and Knowledge sharing on community service

Effect of information sharing on community service	Country	Very much	Much	Less Affect	Do Not Affect	Undecided	% Affect
Improved community development	NG	0(0.0)	0(0.0)	49(22.4)	81(37)	89(40.6)	22.4
	SA	35(38.0)	27(29.3)	11(12)	14(15.2)	5(5.4)	79.4
Community recognition	NG	0(0.0)	21(9.6)	56(25.6)	17(7.7)	125(57.1)	35.2
	SA	0(0.0)	25(27.2)	18(19.6)	35(38)	14(15.2)	46.8
Effective community self-help techniques	NG	0(0.0)	0(0.0)	69(31.5)	99(45.2)	51(23.3)	31.5
	SA	33(35.9)	22(23.9)	8(8.7)	0(0.0)	29(31.5)	68.5
Wider communication with members	NG	21(9.6)	49(22.4)	19(8.7)	11(5)	119(54.3)	30.7
	SA	31(33.7)	24(26.1)	2(2.2)	1(1.1)	25(27.2)	71.8
Way of motivating others to participate	NG	0(0.0)	59(26.9)	43(19.6)	0(0.0)	117(53.4)	46.6
	SA	0(0.0)	0(0.0)	19(20.7)	53(57.6)	20(21.7)	20.7

22.4% of the respondents from selected universities in Nigeria and 79.4% from South Africa indicated that sharing improve community development. A minority both countries (35.2% Nigeria; 46.8% South Africa) highlighted community recognition as an effect of sharing information and knowledge. Less respondents from Nigeria (31.5% indicated that sharing contributes towards effective community self-help techniques than their South African counterparts (68.5%). A small group of respondents from the Nigerian

universities indicated that sharing influences wider communication with community members (30.7%), while the majority of respondents (71.8%) from South Africa felt that it influences wider communication among members. Less respondents from both countries felt that sharing is a way of motivating others to participate (46.6% Nigeria and 20.7% South Africa) in community development.

The South African respondents indicated significant effects of information and knowledge sharing on their community service in most of the highlighted areas in contrast to the Nigerian respondents.

The data obtained about the effects of sharing on the academics in their teaching, research, self-development and community service was subjected to a Pearson rho correlation to test the fourth null hypothesis (Ho4) of the study which reads: *Information and knowledge sharing has no significant effect on the academics in the selected universities in Nigeria and South on their teaching, research, self-development and community service.* The calculated value of rho among the academics in Nigeria was 0.861 and the P value was 0.000 which is less than $\alpha = 0.05$. Therefore, the null hypothesis was rejected; implying that the effect of information and knowledge sharing on the academics in selected universities in Nigeria was significant. The table also presents the calculated rho value among the South African academics as 0.967 and the P value as 0.000, which is less than $\alpha = 0.05$. The fourth null hypothesis was rejected, meaning that there was a significant effect on the academics in selected universities in South Africa.

The results are presented in Table 5.21 below.

Table 5.21: Effects of information and knowledge sharing on teaching, research, self-development and community service

Variables Types	Country	N	Mean	Std. Deviation	Std. Error	r-calc.	DF	P	Remarks
On academic	Nigeria	219	3.6142	1.10014	.07434	.861	217	0.000	Sig.
	Nigeria	219	2.8925	1.02474	.06925				
	South Africa	92	3.7402	.72066	.07513	.967	90	0.000	Sig.
	South Africa	92	3.6109	.44536	.04643				

5.3.8 Challenges to effective information and knowledge sharing

Table 5.22 below presents the data obtained concerning the problems affecting information and knowledge sharing among the respondents. The respondents had to indicate the degree to which each item in the list was considered to be a problem that affects sharing.

Table 5.22: Problems affecting information and knowledge sharing

Problems affecting sharing	Country	Very Much	Much	Less	Not at all	Undecided	% Affect
Inadequate information resources	NG	219(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
	SA	0(0.0)	0(0.0)	13(14.2)	75(81.5)	4(4.3)	14.2
Poor research management	NG	69(31.5)	87(39.7)	59(26.9)	0(0.0)	4(1.8)	98.2
	SA	0(0.0)	0(0.0)	0(0.0)	85(92.4)	7(7.6)	0
Poor communication on seminars, workshops and conferences	NG	81(37)	79(36.1)	48(21.9)	0(0.0)	11(5.0)	95
	SA	0(0.0)	0(0.0)	0(0.0)	92(100)	0(0.0)	0
Poor seminars, workshops and conferences attendance	NG	83(37.9)	75(34.2)	31(14.2)	9(4.1)	21(9.6)	86.3
	SA	0(0.0)	0(0.0)	13(14.1)	76(82.6)	3(3.3)	14.1
Poor support to problem No. 4 above	NG	172(78.5)	47(21.5)	0(0.0)	0(0.0)	0(0.0)	100
	SA	0(0.0)	0(0.0)	0(0.0)	92(100)	0(0.0)	0
Negative attitude of sharing among academics	NG	63(28.8)	93(42.5)	38(17.4)	21(9.6)	4(1.8)	88.6
	SA	19(20.7)	12(13)	5(5.4)	56(60.9)	0(0.0)	39.1
Research communication gap	NG	37(16.9)	69(31.5)	87(39.7)	7(3.2)	19(8.7)	88.1
	SA	0(0.0)	0(0.0)	0(0.0)	59(64.1)	33(35.9)	0

Inadequate information resources was noted as a significant challenge to information and knowledge sharing by all (100%) the Nigerian respondents, and only 14.2% of the

South African respondents. 98.2% of the respondents from Nigeria and 0% of the South African respondents cited poor research management as a challenge. Other significant challenges noted by the Nigerian respondents include: poor communication on seminars, workshops and conferences (95% Nigeria; 0% South Africa), poor seminars, workshops and conferences attendance (86.3% Nigeria; 14.1% South Africa), and poor support for seminar, workshop and conference attendance (100% Nigeria; 0% South Africa). Negative attitude towards sharing among academics was a greater challenge among the respondents from Nigerian universities (88.6%) than the South African universities (39.1%). The same applied to research communication gap (88.1% Nigeria and 0% South Africa).

The problems affecting information and knowledge sharing as highlighted in Table 25 appear to be having more of an effect on the Nigerian scholars as they indicated problems in all the areas, while the South African academics did not appear to be experiencing any significant problems with regards to information and knowledge sharing.

5.3.9 Solutions to the identified problems?

The respondents were provided with a range of common solutions that could minimize the problems of information and knowledge sharing and their responses are presented in Table 5.23 below.

Table 5.23: Solutions for effective information and knowledge sharing

Solution for minimizing problems	Country	Very Common	Common	Less common	Not Common	Undecided	% Common
Provision of adequate resources	NG	219(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
Efficient Research management	NG	75(34.2)	94(42.9)	50(22.8)	0(0.0)	0(0.0)	100
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
Timely information on seminars, workshops and conferences	NG	83(37.9)	91(41.6)	45(20.5)	0(0.0)	0(0.0)	100
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
Improved seminars, workshops and conferences attendance	NG	85(38.8)	79(36.1)	34(15.5)	12(5.5)	9(4.1)	90.9
	SA	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
Provision of research support	NG	219(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
	SA	92(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	100
Open access	NG	89(40.6)	95(43.4)	21(9.6)	0(0.0)	14(6.4)	93.6
	SA	13(14.1)	15(16.3)	14(15.2)	11(12)	39(42.4)	45.6
Institutional repositories	NG	59(26.9)	92(42)	50(22.8)	0(0.0)	18(8.2)	91.8
	SA	75(81.5)	17(18.5)	0(0.0)	0(0.0)	0(0.0)	100

In their responses, all of the Nigerian (100%) and South African (100%) respondents agreed that the provision of adequate resources; efficient research management; timely information on seminars, workshop and conferences; and provision of research support are very common solutions to minimizing the problems of information and knowledge sharing. The only area of contention was Open Access, where the majority of academics from Nigeria (93.6%) felt that it was a common solution and only (45.6%) of the South Africans agreed.

With the exception of Open Access, there was almost complete agreement on the suggested list of measures to curtail the identified problems among the respondents in both countries.

5.3 Summary

This chapter presented the analysis of the questionnaire. Inferential statistics was also used to analyse and interpret the data using the hypotheses formulated for the study. There are four hypotheses and each one of them was tested using two tailed test as detailed in Chapter four. The following main points were obtained and summarised as follows:

1. The analysis was categorised into three levels: demographic characteristics of the respondents; the main research questions; and inferential analysis by testing hypotheses.
2. The study achieved a high response rate, with 77.9% and 91.1% from the selected universities in Nigeria and South Africa respectively.
3. The demographic details of the respondents were captured, and significant similarities and differences were noted. The most notable difference was in the number of male over female respondents. The majority of respondents were from humanities in both. Most of the academics from both countries had Masters' degrees and had 11 to 20 years of experience.
4. The types of information shared and preferred were identified; types of ICTs used for sharing; effect of sharing on the respondents; problems of sharing and common solution were also identified and more details are provided in chapter seven.

The next chapter (6) will present the collaboration trend of the selected universities and the two countries using co-authorship as a measure of collaboration.

CHAPTER SIX

RESEARCH COLLABORATION

6.0 Introduction

This chapter provides a Bibliometric analysis of research collaboration among academics in selected universities in Nigeria and South Africa. The objective was geared towards understanding the collaborative status and trends among academics in the study areas and to uncover the differences concerning research collaboration within their universities, between their universities in their countries and with other universities from the two countries. The study covered collaborative practices within the period of 2003 to 2013 in six selected universities, three each in Nigeria and South Africa.

The following questions are addressed in the chapter:

1. Is there any research collaboration between the selected universities?
2. What are the collaborating universities' contributions in terms of the number of co-authored papers from 2003 to 2013?
3. How do Nigeria and South Africa compare in research collaboration among academics/researchers in the selected universities?
4. What are the country and university's degrees and strengths of collaboration within the period of study?
5. What are the trends of research collaboration within the period of 2003 to 2013?
6. What is the influence of research collaboration on research impact using co-authored papers from the selected universities?
7. What is the relationship between research collaboration and knowledge sharing?

6.1 Presentation of the Findings

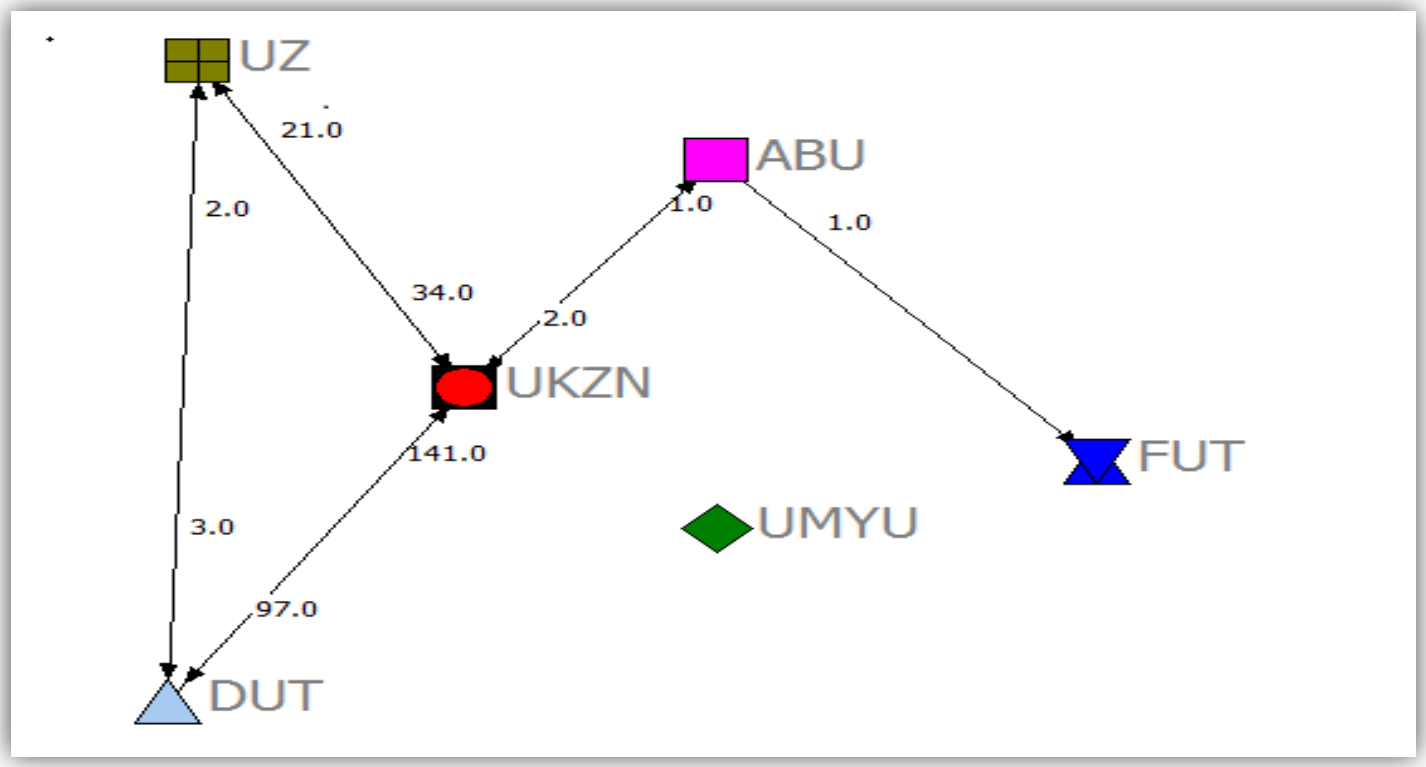
6.1.1 Collaboration between the six selected universities in Nigeria and South Africa

Data for this section was collected using advanced search strategy by typing the full names of the six selected universities with each other (two at a time) to search for collaboration domestically (with other universities) and between the two countries within the period of study. The networking figure was attained by designing a matrix

connecting the collaborating universities using Microsoft Excel and then copied the data into UCINET 6 software for processing.

Figure 6.1 below depicts the collaborative networks: the arrows connecting the universities indicate whether or not there was a two way collaboration (each arrow indicates direction of the collaboration). The figures on each side of the arrow indicate the number of times one university collaborated with the other and vice-versa. For example, UKZN collaborated with DUT 238 times all together, while UKZN and UZ collaborated 55 times, and UKZN has also collaborated with ABU 3 times during the study period. DUT and UZ collaborated 5 times while ABU collaborated with FUT only once. As the graph indicates, the only university that collaborated both within and outside the home country was UKZN, even though the collaboration was more with sister universities in South Africa; the only collaboration between UKZN and other selected universities in Nigeria was between UKZN and ABU. UMYU had no collaboration both with sister universities in Nigeria and with the selected universities in South Africa within the study period.

Figure 6.1: collaboration networks within and among the six selected universities in Nigeria and South Africa.



6.1.2 Comparison on research collaboration among academics in the selected universities?

6.1.2.1 Publication output of the six selected universities

The data obtained for the total publications (both single authored and co-authored) of the selected universities available on the database (SCOPUS) used within the study period. The results are presented in Table 6.1 below.

	UKZN			DUT			UNIZULU			ABU			FUT			UMYU		
YEAR	**TOTAL**	**S**	**M**	**TOTAL**	**S**	**M**	**TOTAL**	**S**	**M**	**TOTAL**	**S**	**M**	**TOTAL**	**S**	**M**	**TOTAL**	**S**	**M**
2003	14	2	12	18	0	18	31	9	22	94	28	66	0	0	0	0	0	0
2004	378	82	296	11	0	11	28	3	25	78	15	63	0	0	0	0	0	0
2005	699	144	555	23	0	23	50	5	45	115	14	101	0	0	0	0	0	0
2006	831	155	676	33	3	30	40	5	35	170	19	151	1	0	1	0	0	0
2007	884	146	738	52	10	42	49	3	46	199	30	169	1	0	1	0	0	0
2008	1,038	184	854	39	7	32	60	6	54	229	16	213	4	1	3	0	0	0
2009	1,105	177	928	55	7	48	69	8	61	236	24	212	4	2	2	0	0	0
2010	1,133	187	946	76	17	59	74	12	62	298	16	282	4	0	4	2	0	2
2011	1,461	170	1,291	113	26	87	66	8	58	372	29	343	3	1	2	0	0	0
2012	1,684	244	1,440	87	11	76	52	6	46	317	17	300	8	0	8	1	0	1
2013	1,848	292	1,556	131	19	112	76	13	63	295	14	281	12	1	11	6	0	6
GRAND TOTAL	**11,075**	**1,783**	**9,292**	**638**	**100**	**538**	**595**	**78**	**517**	**2,403**	**222**	**2,181**	**37**	**5**	**32**	**9**	**0**	**9**

Table 6.1 Single and multiple authored papers of the six selected universities

KEY S = Single Authored Papers **M** = Multiple Authored Papers
TOTAL = Totals include duplicate articles (i.e. articles belonging to two or more authors counted as whole articles for each author)

6.1.2.2 Co-authored papers of the selected universities from 2003 to 2013

In order to depict each of the six universities co-authored papers' contribution, the total publications per university were obtained using advanced search technique for the period of 2003 – 2013. Data was sorted according to number of authors per article, and articles that were published by two or more authors were collated.

Figure 6.2 below illustrates the contribution of academics from the six selected universities in Nigeria and South Africa with respect to co-authored papers from 2003 – 2013. In the case of Ahmadu Bello University (ABU), the number of co-authored papers was steadily growing, with slight downward fluctuations in the years 2004 and 2009. There was a decline for two consecutive years from 2011 to 2013, the highest record of 343 co-authored publications was reached in 2011 but the output declined to 300 and 281 in 2012 and 2013 respectively.

The trend has not been encouraging for the Federal University of Technology (FUT) throughout the period of study, even though it showed some positive growth towards the end in 2012 and 2013, recording a total of 8 and 11 co-authored papers respectively. However, the change was not commendable compared to other universities in this study.

The academics from Umaru Musa Yar'adua University (UMYU) in Nigeria provided no contributions from 2003 to 2009 and also in 2011 and only 2, 1 and 6 papers were co-authored in 2010, 2012 and 2013 respectively. This was the poorest performance of the six selected universities.

There was a steady increase in the number of papers published by two or more authors from the University of KwaZulu-Natal. The output grew considerably and consecutively in 2011, 2012 and 2013 when 1,291, 1,440 and 1,556 co-authored papers were recorded respectively.

The Contribution of the academics from Durban University of Technology (DUT) throughout the period of study was steadily increasing, with a few downward fluctuations of 11, 32 and 76 papers in the years 2004, 2008 and 2012 respectively.

The University of Zululand (UZ) was not steady even though there were records right from 2003. The output kept fluctuating, with the highest record of 61, 62 and 63 publications per annum in the years 2009, 2010 and 2013 respectively.

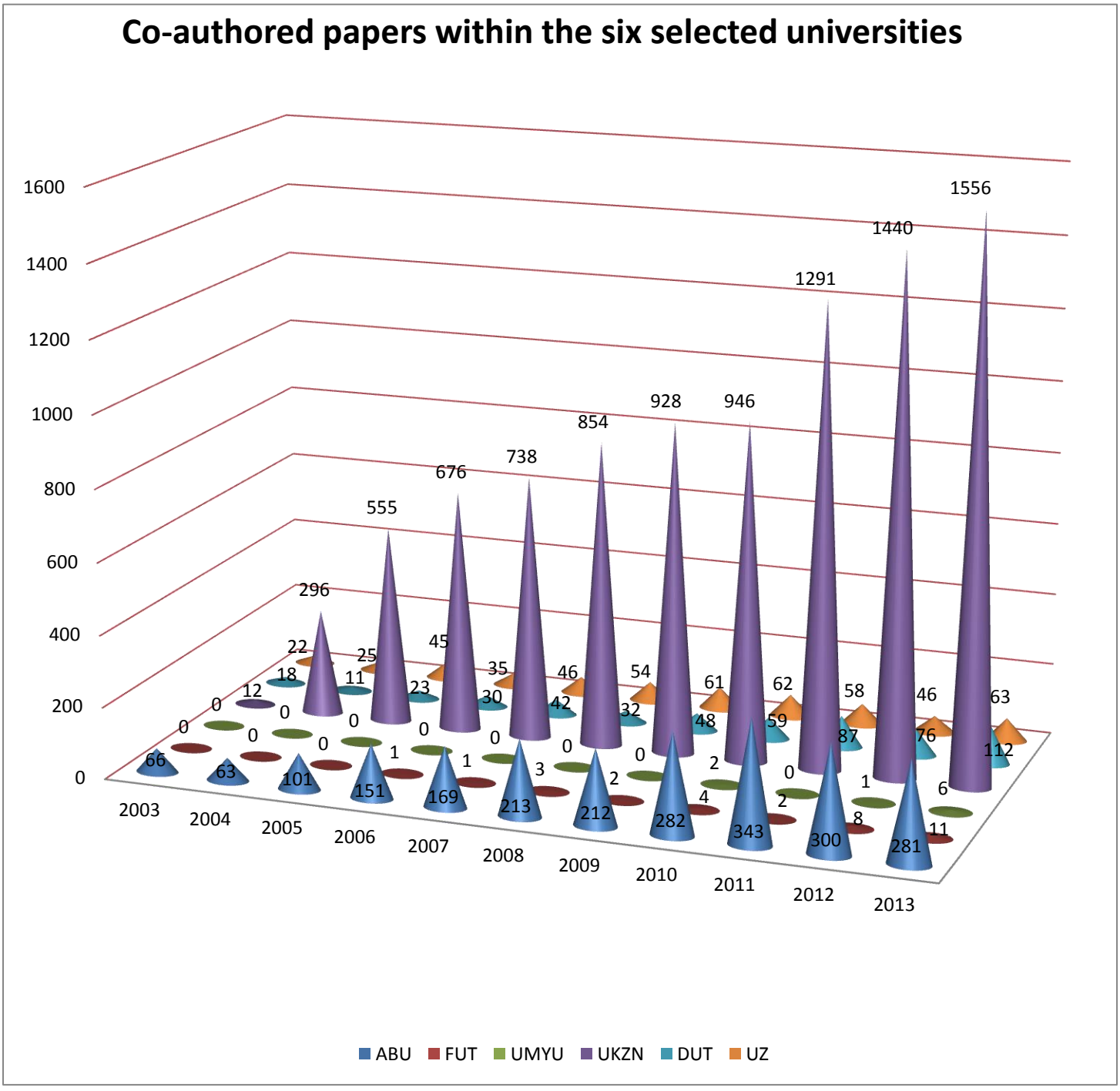


Figure 6.2: Co-authored papers of the six selected universities

6.1.3 Comparison of Nigeria and South Africa in research collaboration

The data presented below is the aggregate of all the entire single-authored, co-authored and the total (single- and co-authored) publications of the three selected universities in Nigeria for the period of study.

Figure 6.3 Mode of authorship in Nigeria

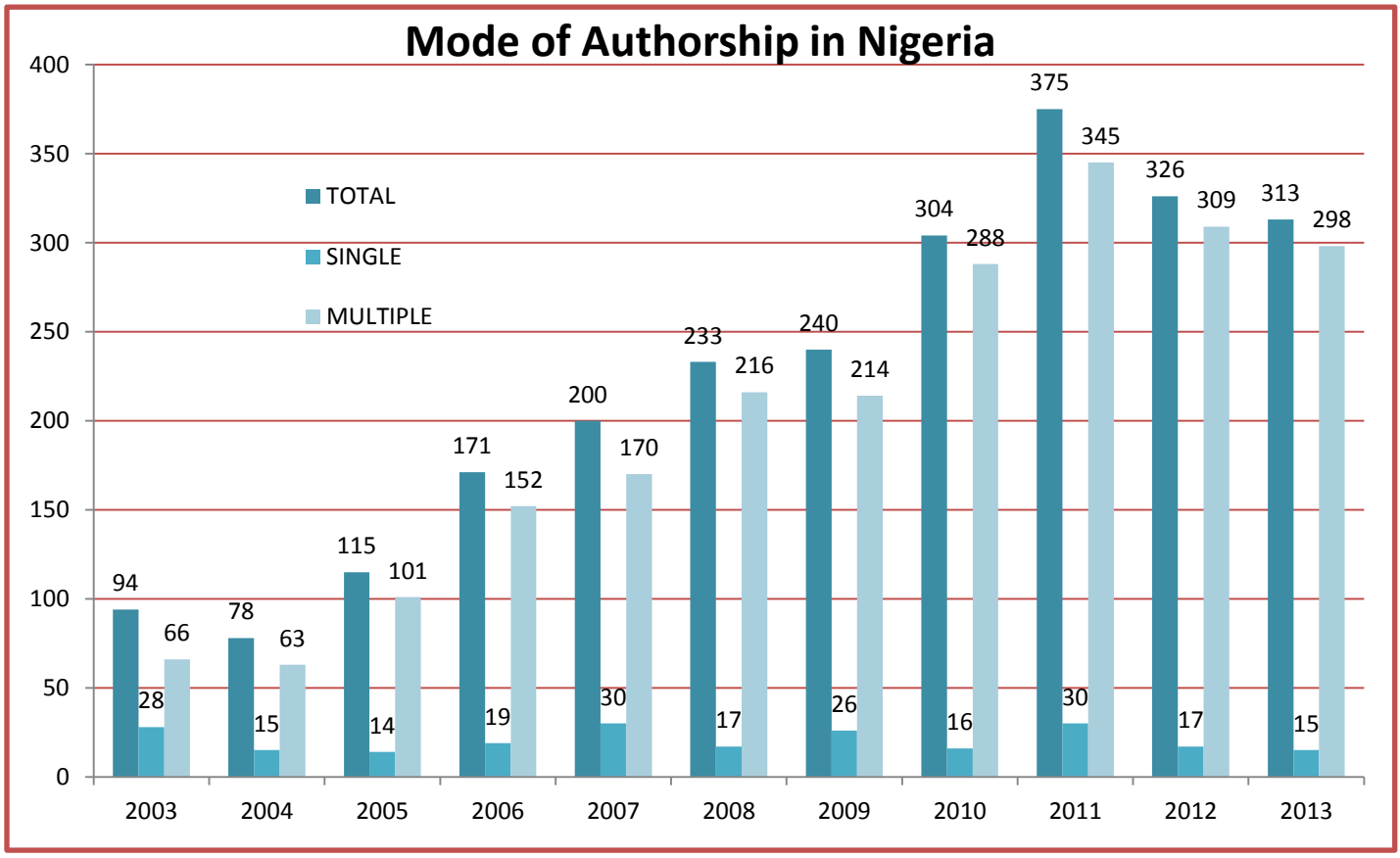


Figure 6.3 illustrates the total publication output by the academics from the three universities in Nigeria and the trend in single- and co-authored papers during the period of 2003 to 2013. The trend shows that throughout the study period there were significantly more co-authored papers than single-authored papers. It also reveals that the output was increasing over the years, with the exception of 2012 and 2013 when the records dropped to 309 and 298 co-authored papers respectively.

6.1.3.1 Mode of authorship in South Africa

The data presented here is the aggregate of all single, co-authored and the total (single and multiple authored) publications of the three selected universities in South Africa for the period of study.

Figure 6.4: Mode of authorship in South Africa

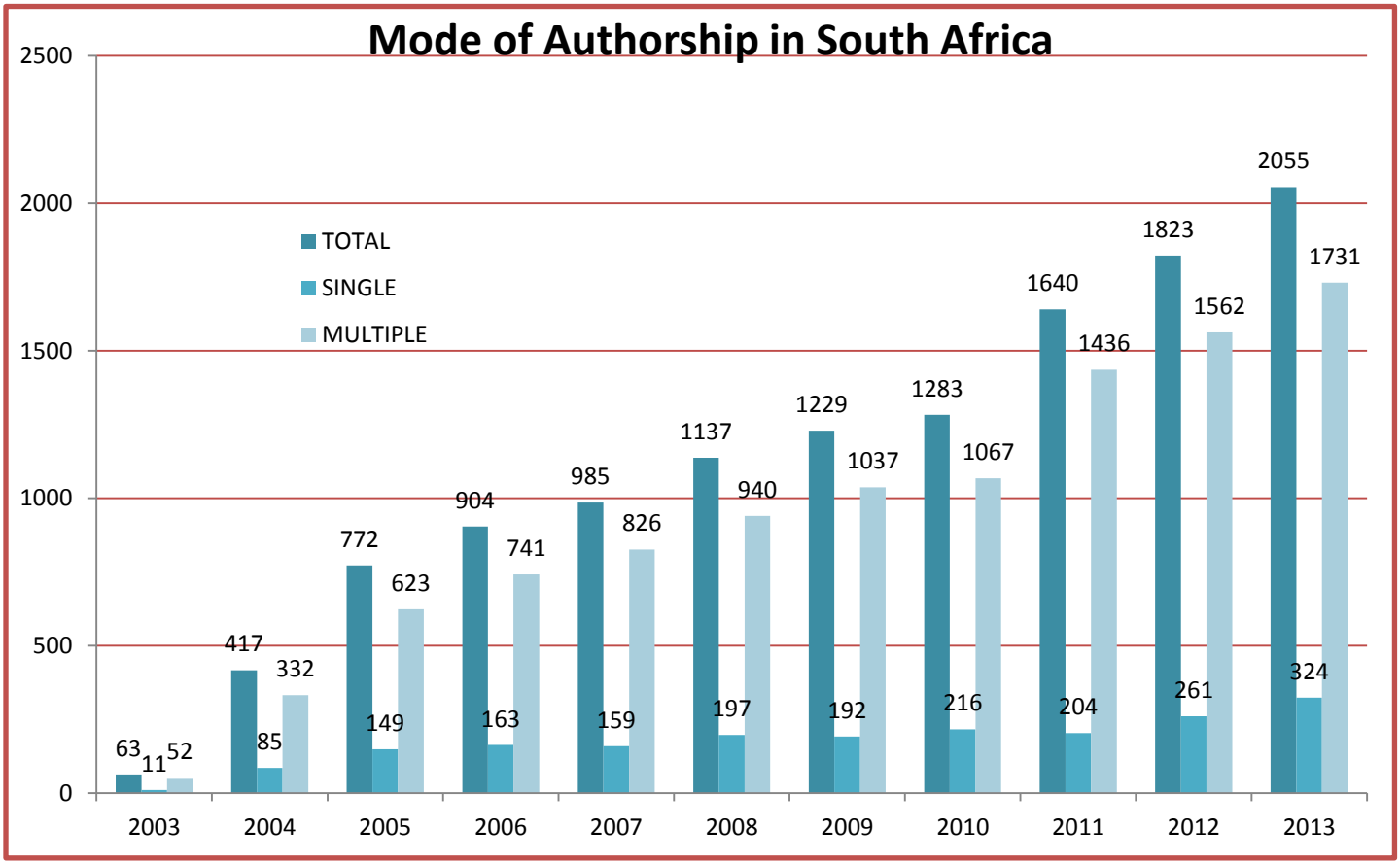


Figure 6.4 shows the trend in single- and co-authored papers by the academics from South Africa. The publication output in both single- and co-authored papers was steadily increasing throughout the period of study. The output reached 1,037 co-authored papers by the year 2009 and maintained that trend until 2013 when the highest record of 1,731 was reached, which also marked the last year of the study period. Single-authored papers also reached their highest peak of 324 in the year 2013.

6.1.4 Country and selected universities' degree and strength of collaboration within the period of study

While various methods of calculating the degree of collaboration have been used in research, this study opted for the formula proposed by Subramanyam (1982).

The degree of collaboration $C = \frac{Nm}{Nm+Ns}$

Where, C = Degree of collaboration

Nm = Number of Multiple authored papers

Ns = Number of single authored papers

Here, $C = \frac{2222}{2222+227} = 0.91$ For Nigeria

$C = \frac{10347}{10347+1961} = 0.84$ For South Africa

Table 6.2 below revealed that, there is a slight difference in the degrees of collaboration when comparing Nigeria (0.91) and South Africa (0.84). This indicates that Nigeria had a higher percentage of co-authored papers against single-authored papers than South Africa, even though the number of both single- and co-authored publication in South Africa was higher throughout the period of study. In essence, the higher the ratio of co-authored papers over single-authored papers, the higher the degree of collaboration.

Table 6.2 Degree of collaboration of the two countries based on the selected universities

COUNTRY	TOTAL NUMBER OF PAPERS	SINGLE AND MULTIPLE AUTHORED PAPER PERCENTAGES				DEGREE OF COLLABORATION
		S	%	M	%	
NIGERIA	2,449	227	9.27	2,222	90.73	0.91
SOUTH AFRICA	12,308	1,961	15.93	10,347	84.07	0.84

Table 6.3 below presents the data obtained with respect to the total publications of the six selected universities for the period of 2003 to 2013 and the data was used to figure out the number and percentage of single and co-authored articles.

Table 6.3: Degree of collaboration of the six selected universities

UNIVERSITY	TOTAL NUMBER OF PAPERS	NUMBER OF AUTHORS	AVERAGE AUTHORS PER PAPER	SINGLE AND MULTIPLE AUTHORED PAPER PERCENTAGES				DEGREE OF COLLABORATION
				S	%	M	%	
UKZN	1,554	7,539	4.85	8	0.51	1546	99.49	0.99
DUT	206	711	3.45	25	12.14	181	87.86	0.88
UZ	344	1,193	3.47	28	8.14	316	91.86	0.92
ABU	456	1,797	3.94	24	5.26	432	94.74	0.95
FUT	137	478	3.49	15	10.95	122	89.05	0.89
UMYU	23	131	5.70	0	0.00	23	100.00	1.00

Table 6.3 reveals that in the case of South Africa, there were 8 single-authored (0.51%) and 1,546 co-authored papers (99.49%) for UKZN; 25 single-authored (12.14%) and 181 co-authored publications (87.86%) for DUT; and 28 (8.14%) and 316 (91.86%) single- and co-authored papers respectively for UZ. In Nigeria, there were 24 single-authored (5.26%) and 432 co-authored publications (94.74%) for ABU; 15 single-authored (10.95%) and 122 co-authored publications (89.05%) for FUT; and 0 single-authored (0.00%) and 23 co-authored publications (100%) for UMYU.

The average number of authors per paper for the articles in the selected universities in South Africa were led by UKZN with the highest number of authors (4.85), followed by DUT (3.45) and UZ (3.47), while the Nigerian universities were led by UMYU (5.70), ABU (3.94), and FUT (3.49).

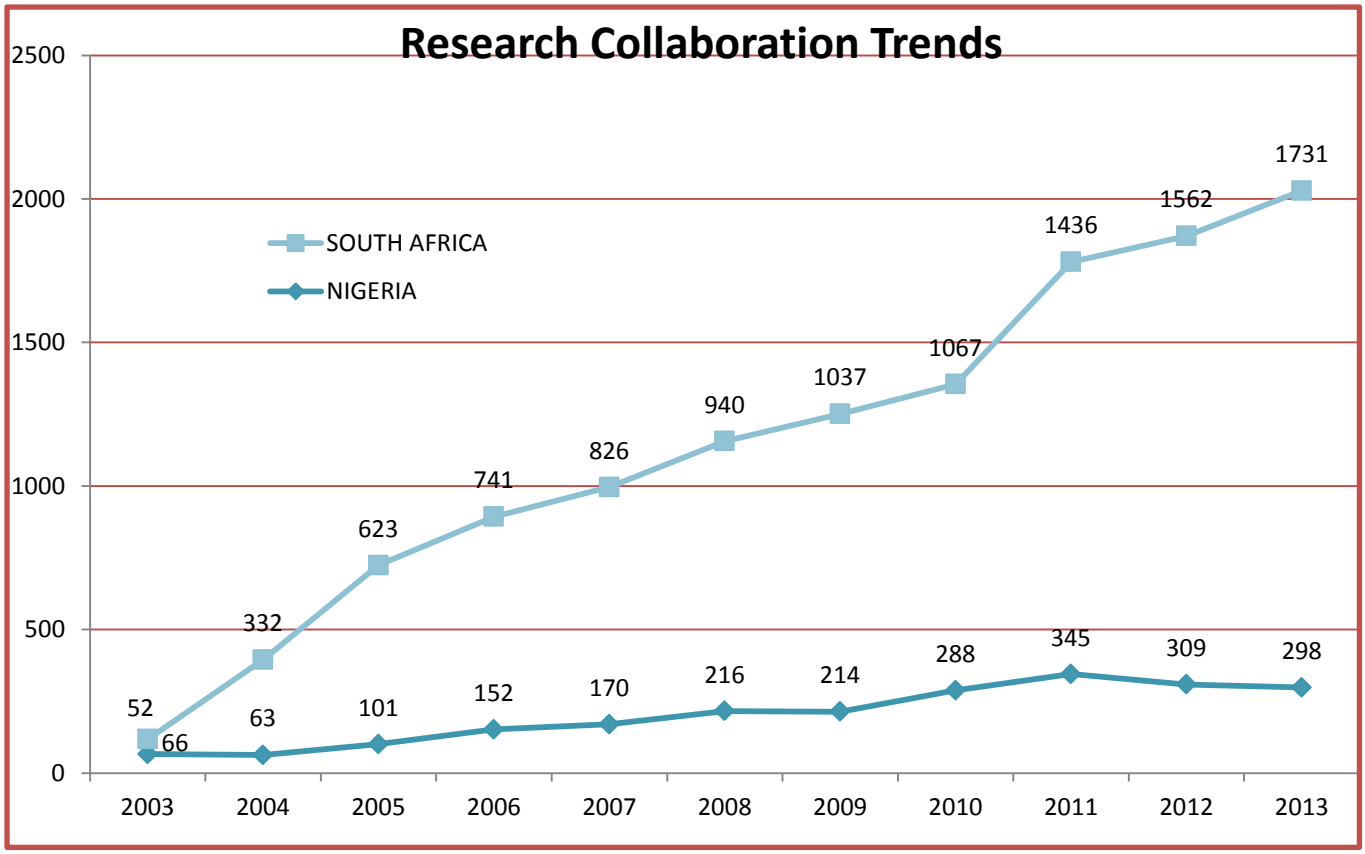
The degree of collaboration in the universities was also calculated for the study period as shown in the table. The degree of collaboration in South Africa was 0.99, 0.88 and 0.92 for UKZN, DUT and UZ respectively, while in Nigeria it was 0.95, 0.89 and 1.00 for ABU, FUT and UMYU respectively.

6.1.5 Trends of research collaboration from 2003 to 2013

The data in this section represents the aggregate figures of the combined co-authored papers (2 authors or more) for the selected universities per country over the study period. The figures were compared country-wise in order to bring to light the growth co-authored papers, which is the determinant/indicator of collaboration and the basis for comparison.

Figure 6.5 below reveals a significant disparity in the number of co-authored papers over the years in favour of South Africa; the number of co-authored publications in South Africa increased annually to 1,731 in the year 2013 against Nigeria's peak of 345 in the year 2011.

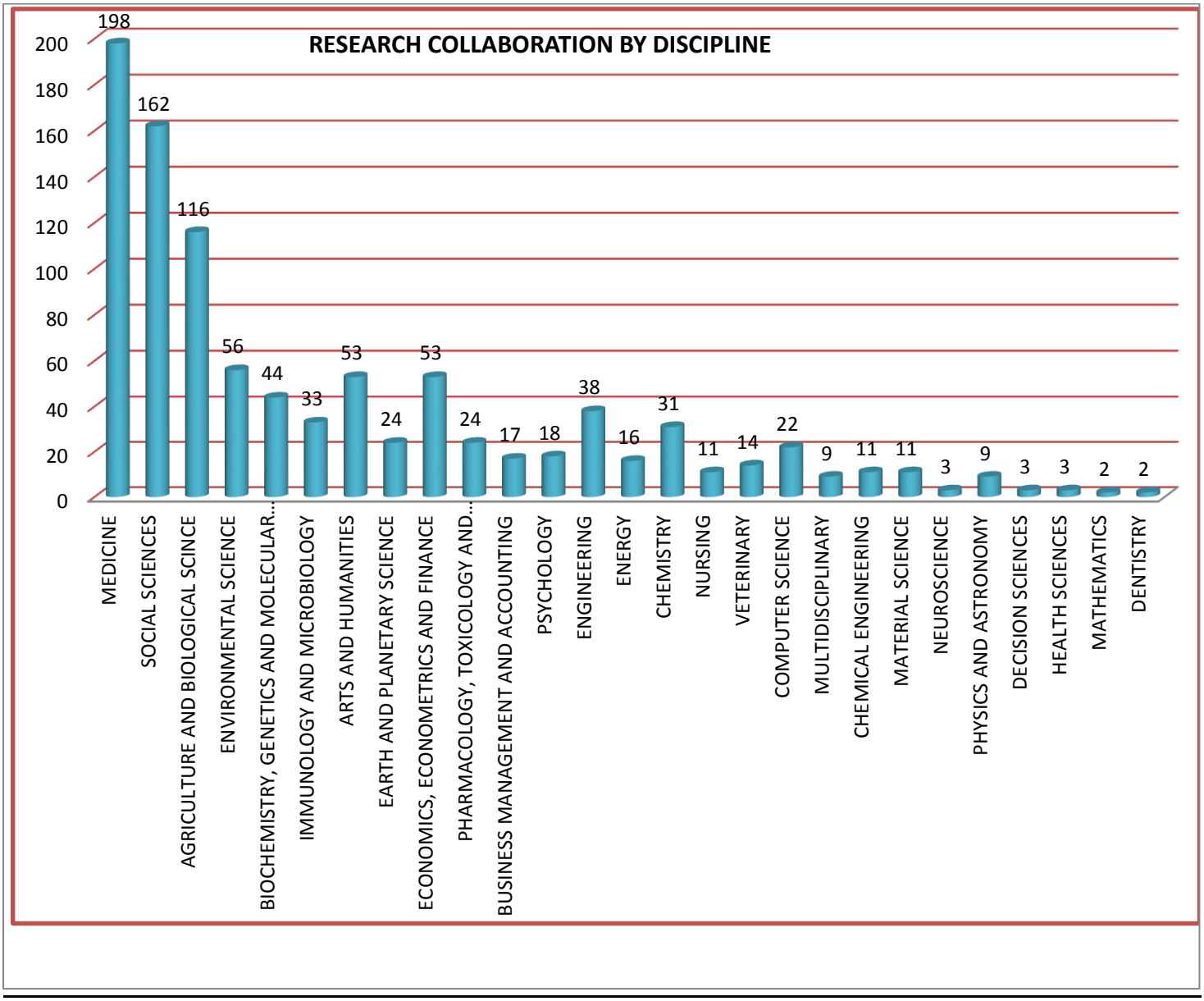
Figure 6.5: co-authorship trends of the two countries during the period of study



6.1.5.1 Areas of research collaboration between Nigeria and South Africa 2003 to 2013

Data for the number and frequency of the areas/fields in which collaboration took place between university academics from the two countries within the study period was extracted from the database and the results are presented in Figure 6.6 below.

Figure 6.6 Areas of collaboration and the frequency of collaboration



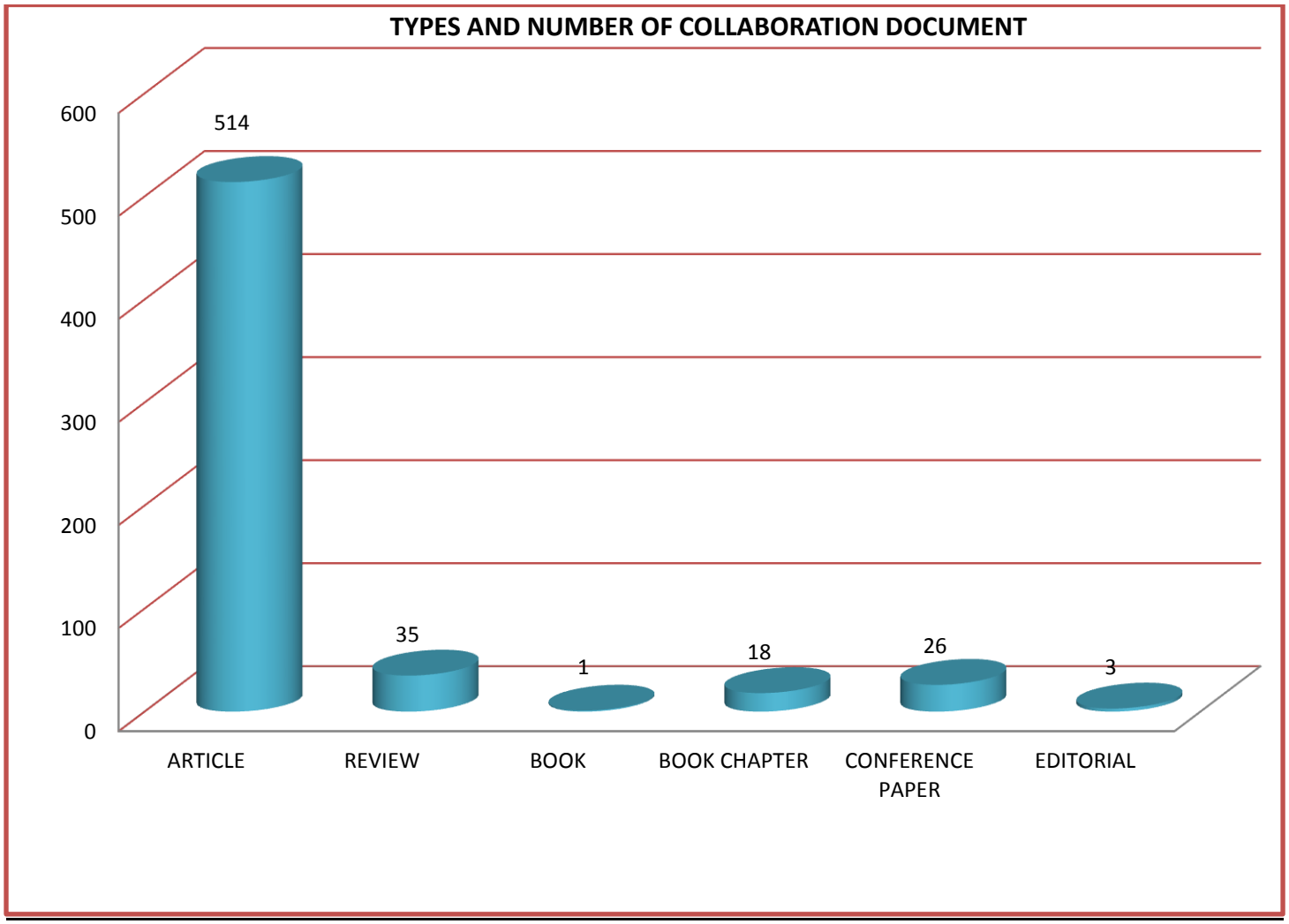
The above figure reveals that there were twenty seven areas of collaborative research between university academics from Nigeria and South Africa for the research period. The majority of collaborative publications were in the area of medicine (198), followed by social the sciences (162), agriculture and biological sciences (116), environmental

sciences (56), biochemistry and genetics (44) and immunology & microbiology (33). The least number of collaborative publications were in the areas of health science (3), mathematics (2) and dentistry (2).

6.1.5.2 Types and frequency of collaborative document between university academics from Nigeria and South Africa 2003 to 2013

The type and frequency of collaborative publications were also investigated. The majority of publications were journal articles (514), Reviews (35), Books (1), Book chapters (18), Conference papers (26) and Editorial (3). The results obtained are presented in Figure 6.7 below.

Figure 6.7 Types of publications used for collaboration



6.1.5.3 Top twenty collaborating authors between university academics from Nigeria and South Africa 2003 to 2013

The data for this section was obtained by extracting the names, number of publication, university affiliation, and country of all the authors who collaborated with others appearing on the database within the study period, using advanced search between university academics from the two countries and the list was sorted of the number of collaborations by each author. The result is presented in Table 6.4 below.

Table 6.4 Top twenty collaborating authors

NAME OF AUTHOR	UNIVERSITY/INSTITUTION	COUNTRY	NUMBER OF PUBLICATIONS
Loto, C. A.	Twane	SA	8
Popoola, A. P. I.	Twane	SA	5
Afolayan, A. J.	Fort Hare	SA	5
Eloff, J. N.	Pretoria	SA	5
Van Staden, J.	UKZN	SA	5
Chigor, V. N.	Fort Hare	SA	4
Fatoki, O. S.	Cape Peninsula	SA	4
Ayede, A. J.	Ibadan	NIG	4
Mc Gaw, L. J.	Pretoria	SA	4
Okeniyi, J. O.	Covenant	NG	4
Kazeem, M. I.	Lagos	NIG	4
Okoh, A. I.	Fort Hare	SA	4
Oluwafemi O. S.	Cape Peninsula	SA	4
Atilola, O.	Lagos	NIG	4
Adesokan, H. K.	Ibadan	NIG	3
Chigor, V. N.	Fort Hare	SA	3
Adeyemi, O. O.	Olabisi Onabanjo	NIG	3
Adedini, S. A.	Wits	SA	3
Akinwusi P. O.	Ladoke Akintola	NIG	3
Baro, E. E.	Abraka	NIG	3

Table 6.4 presents the top twenty collaborating authors in the two countries within the period of study. The top authors consisted of twelve South Africans and eight Nigerians. Loto C. A., from South Africa top the list with 8 co-authored papers.

6.1.5.4 The collaborating universities

The data in this section was obtained from the list of the top collaborating authors as alluded in 6.1.5.3 above. There are twelve Nigerian universities and eight South African universities among the top twenty as presented in table 6.5 below.

Table 6.5 Top twenty collaborating universities

UNIVERSITY	COUNTRY	NUMBER OF PUBLICATIONS
University of Ibadan	NIG	60
Obafemi Awolowo University	NIG	44
University of Witwatersrand	SA	34
University of KwaZulu-Natal	SA	31
University of Nigeria	NIG	31
University of Pretoria	SA	30
University of Cape Town	SA	27
University of Port Hare	SA	27
University of Johannesburg	SA	22
University of Ilorin	NIG	22
University of Lagos	NIG	20
Tshwane	SA	19
Covenant University	NIG	18
University of Port-Harcourt	NIG	17
University of Calabar	NIG	15
Delta State University	NIG	14
University of Limpopo	SA	14
Ahmadu Bello University Zaria	NIG	13
University College Ibadan	NIG	13
Ladoke Akintola University	NIG	13

The highest number of collaborative research was by the Nigerian universities, specifically the University of Ibadan (60 publications), and Obafemi Awolowo University (44 publications). The top three collaborating South African universities were the University of Witwatersrand (34 publications), the University of KwaZulu-Natal (31 publications) and the University of Pretoria (29 publications).

6.1.6 What is the influence of research collaboration on research impact using co-authored papers from the six selected universities in Nigeria and South Africa, 2003-2013?

Based on data obtained for all the publications from the six selected universities in the two countries, the cumulative number of citations received by each paper within the period of study was also counted. The total citations for all papers (single- or co-authored) was divided by the total number of papers (single- or co-authored) In order to come up with the average citations per paper as can be seen in Table 6.6 below.

Table 6.6: Number of citations per single and multiple authored papers

NUMBER OF AUTHORS	TOTAL CITES		PAPERS		CITES PER PAPER	
	NIG	SA	NG	SA	NIG	SA
1	823	7,142	227	1,961	3.63	3.64
2 AND MORE	8,370	92,895	2,222	10,347	3.77	8.98
TOTAL	9,193	100,037	2,449	12,308	3.75	8.13

Table 6.6 relays the data for the comparison of citations per paper and the nature of authorship (i.e. single or multiple) in Nigeria and South Africa. This comparison was done to establish the link between collaboration and research impact. It was discovered that Nigeria's 227 single-authored papers received a total of 823 citations with an average of 3.63 citations per paper while the South African 1961 single-authored papers received 7,142 citations with an average of 3.64 citations per paper, and Nigeria's 2,222 co-authored papers received a total of 8,370 citations with an average of 3.77 citations per paper, while South Africa's 10,347 co-authored papers received a total of 92,895 citations with an average of 8.98 citations per paper.

6.1.7 Relationship between research collaboration and knowledge sharing

The trend in collaboration of the individual universities and countries at large had a significant correlation with the number of authors coming together to publish, and this in turn influenced the number of times a particular article was cited. This is reflected in the

two countries where the average number of citations received by single-authored papers was significantly lower than the average citations received by the co-authored papers. The evidence suggests that knowledge is shared widely and more often through co-authored papers. Co-authored papers also determine the degree of collaboration (based on the average authors per paper) because the greater the number of authors collaborating the more knowledge is shared. In essence most people prefer to cite papers that are co-authored as these types of papers had more of an impact on coverage and also because the different views of the contributing authors are condensed together making the article richer. Therefore, it is deduced that there is a strong relationship between research collaboration and knowledge sharing.

6.2 Summary

The data obtained for this study through the database Scopus indicates that there was a significant amount of collaborative researches by the universities in the two countries. There was evidently less collaboration in the selected Nigerian universities compared to their South African counterparts for the study period, even though the visibility (availability on the Net) of publications is an issue that needs thorough investigation, especially in Nigeria. The general research collaboration trend in South Africa increased throughout the research period and doubled the collaboration trend in Nigeria, sometimes by up to 600% annually. The six South African universities were found to be more productive in terms of general (domestic and international collaborative research than their Nigerian counterparts.

The degrees of collaboration for the two countries were calculated and the Nigerian degree of collaboration was 0.91 as against that of South Africa which was 0.84. This means that the ratio of co-authored papers to single authored papers is higher in Nigeria than in South Africa.

The major collaboration and frequency between the two countries includes the following areas: medicine (198), social sciences (162), agriculture and Biological Sciences (116), and the least were health sciences (3), mathematics (2) and dentistry (2).

A number of different publications were used for the dissemination of collaborative research among the universities and the major ones in order of magnitude were: Article

(524), Reviews (35), Conference papers (26), Book Chapters (18), Editorial (3) and Book (1),

Loto C. A. from Tshwane University was the highest collaborating author (8 publications). The list had the first five most productive authors from South Africa.

The top two most collaborating universities were Nigeria's University of Ibadan and Obafemi Awolowo University 60 and 44 collaborative publications respectively.

The chapter revealed that research collaboration has an influence on research impact judging by the figures, this is more obvious in South Africa.

The next chapter (7) discusses the findings.

CHAPTER SEVEN

COMPARATIVE DISCUSSION OF THE FINDINGS

7.0 Introduction

The findings of this study “information and knowledge sharing among academics in selected universities in Nigeria and South Africa” are discussed in this chapter. The data was collected from a sample of academics through a survey, and informetrics was also applied to study research collaboration in the selected universities for the period of 2003 - 2013. The discussion is divided into: the characteristics of the respondents; information and knowledge sharing practices based on the research questions, and the testing of hypotheses; and an informetric discussion including the hypotheses tested therein and an informetric discussion based on the data gathered through an online database (Scopus).

7.1 Characteristics of the respondents

7.1.1 Gender of the respondents

The survey results revealed that males constituted the majority of respondents in the selected universities in Nigeria (74% male; 26% female) and South Africa (70.7% male; 29.3% female). This shows that there were similar trends in the gender distribution of academics in both countries, and males dominated the population. The study suggests that female graduates have less interest in building their career in the academic line hence the limited number recorded in most universities especially in Africa.

7.1.2 Disciplines of the respondents

The disciplines were categorized into three main areas, i.e. the Natural Sciences, Humanities, and Applied Sciences. The data revealed that the majority of surveyed academics in both countries fell under the humanities (57.1% Nigeria; 41.3% South Africa), followed by the Natural Sciences (27.9% Nigeria; 31.5% South Africa), while the least number of respondents belonged to the Applied Sciences (15.1% Nigeria; 27.2% South Africa). The data gathered indicated that by percentage, there was slightly more staff in the Humanities in Nigeria than in South Africa, while the ratio of South African to Nigerian academics was greater in both the Natural Sciences and Applied Sciences.

7.1.3 Educational qualifications of the respondents

The highest educational qualification held by the majority of the respondents in both countries was a Master's degree (52.5% Nigeria; 51.1% South Africa), followed by a PhD (30.1% Nigeria; 42.2% South Africa), and bachelor's degree (17.4% Nigeria; 6.5% South Africa). However, a comparison of the percentage for each category in the two countries reveals that there were a higher percentage of higher educational qualification (PhD) in the selected universities in South Africa, probably due to better standards of teaching and research output based on the respondents' revelations regarding the problems affecting information and knowledge sharing.

7.1.4 Years of experience of the respondents

Majority of the respondents from the selected universities in both countries had 11 - 20 years of experience (42% Nigeria; 53.3% South Africa), followed by 21 - 30 years (26.6% Nigeria; 26.1% South Africa), and less than 10 years (24.2% Nigeria; 17.4% South Africa) of experience. The least number of respondents had over 30 years (7.3% Nigeria; 3.3% South Africa) of experience. The data shows that there were more upcoming academics in the selected universities in South Africa who had between 11 – 20 years' experience, and this category of academics is considered to be in their prime in terms of teaching and research. However there were also slightly more academics in Nigeria in the category of < 10 years who are in their youth and inexperience, are also deemed to be very crucial in the growth and development of any university. Therefore, there are advantages attached to each of the two countries with respect to upcoming academics. There also seemed to be more over 30's in Nigerian academia going by the percentage, a category that has the longest experience to pass onto the younger generation. The trends in years of experience in both Nigeria and South Africa were very encouraging for academia.

7.2 Comparative discussion of responses in relation to the research questions

This section provides a comparative discussion of the survey findings in Nigeria and South Africa in relation to the main research questions of the study.

7.2.1 Information and knowledge sharing by the academics in the selected universities in Nigeria and South Africa

Q1. Do the academics share information and knowledge?

All the respondents from the selected universities in the two countries attested to understanding the concept of information and knowledge sharing (100% Nigeria: 100% South Africa). They all (100%) also stated that they shared information and knowledge. This is indicative of the positions of the countries in African research rankings, even though Reuters (2010) and Aliyu (2007) have shown that the level at which the two countries publish research output is low compared to global practice. In keeping Walczak's (2005) assertion that the world has moved away from an industrial economy to a knowledge economy where individuals, organisations and governments invest in knowledge management practices for competitive growth. This also means that the academics have realised the importance of information and knowledge seeking and sharing to gaining competitive advantage. Information and knowledge sharing addresses the elements of participation and building networks which bring about wider participation in communities of practice as highlighted in the Social Capital Theory in Chapter 2. Academics who participated in sharing knowledge develop their professional careers by acquiring more ideas, experiences, refining and integrating different views and perspectives on topical issues, ensuring uniformity in research.

7.2.2 Types of information and knowledge shared by the academics in the selected universities

Q2. What type of information and knowledge do the academics share?

The survey established that the major type of information and knowledge shared by both the Nigerian and South African academics was information on conferences, seminars and workshops (100% Nigeria:100% South Africa). This finding is supported by Rieges's (2005) assertion that knowledge sharing is a mutual process involving two

or more individuals sharing and refining their expertise and benefitting from each other's wealth of experience. The Nigerian academics were more interested in sharing information on part-time, visiting and sabbatical jobs (86.3%). The surveyed academics in both countries also shared information on scholarship availability (54.4% Nigeria: 75% South Africa); information on new technology (100% Nigeria: 100% South Africa). The academics evidently understood the usefulness of technology and had developed the behaviour of using these technological tools for smoother and easier handling of their information and knowledge sharing activities. This correlates with the growing number of easy to use platforms for knowledge acquisition and sharing and the emergence of Web 2.0, which has facilitated the development of virtual communities (Hsu et al., 2007; Hsu and Lin, 2008). To sustain their participation and benefit from the advantages of sharing provided by these platforms most academics resort in establishing more professional ties as reported by Aliyu (2007).

7.2.3 Reasons for information and knowledge sharing

Q3. Why do the academics share information and knowledge?

The study revealed that there were similarities in the reasons for sharing with regards to improving research out-put (94.1% Nigeria: 100% South Africa) and supporting research activities (91.3% Nigeria: 100% South Africa), become popular among colleagues (84.9% Nigeria; 100% South Africa) and strengthening academic culture (83.6% Nigeria; 100% South Africa). These findings are supported by Mukherjee and Stem (2007) in their working paper titled "disclosure or secrecy" discussing the economic and social benefits of openness while undertaking research especially in the sciences, who state that one of the reasons for sharing knowledge is to gain popularity and influence; and Nelson's (2004) observation while studying the benefits of common scientific practices among scientists, that it leads to familiarity with others in their fields.

Gamble (2002) postulates that sharing with members of group allows one to occupy a central position in the group. It also shapes the academic values, norms, and general outlook on life.

7.2.4 Patterns of information and knowledge sharing

Q4. How do the academics share information and knowledge?

Most of the surveyed academics attested to sharing information and knowledge with academics in their fields (82.6% Nigeria: 100% South Africa); and during seminars workshops and conferences (93.6% Nigeria: 100% South Africa). Studies confirm that formal academic gatherings are the leading platforms for knowledge sharing (Gamble, 2002; Walsh et al., 2007). The academics in both countries also explored other patterns of sharing, such as participation in joint publication (64.4% Nigeria; 100% South Africa). They also indicated a strong measure of collaboration with academic within their institutions (79% Nigeria; 100% South Africa). A significant number of the academics also stated that they shared information and knowledge with academics in their countries (79% Nigeria; 85.9% South Africa). The latter points to efforts of inter-varsity research collaboration which would be motivated by many factors including but not limited to, sense of belonging and participatory practices; leading to building trust for networking between and among academics; thereby strengthening the academic culture, mutual trust and professionalism. This point is supported by the number of academics who shared information through professional memberships (77.6% Nigeria; 81.4% South Africa). Despite the fact that there were more South African academics involved in different patterns of sharing, the majority of the academics in the selected universities in both countries demonstrated very similar patterns of sharing.

7.2.5 Extent and frequency of information and knowledge sharing

Q5. How often do the academics share information and knowledge?

The surveyed academics in Nigeria and South Africa often shared information through personal discussions with colleagues (80% Nigeria; 100% South Africa), at conferences, seminars and workshops (84.5% Nigeria: 100% South Africa), before undertaking research (62.3% Nigeria: 77.2% South Africa) and with colleagues within their disciplines (74% Nigeria: 100% South Africa). According to the Social Capital Theory, this behaviour suggests feeling of trust and a sense of belonging among the academics which ensured reciprocity as the more individuals share with colleagues; the more they acquire information and knowledge. There were some differences noted with regards to the extent to which the academics informed colleagues on research progress

(46.6% Nigeria; 89.1% South Africa) and shred with colleagues outside their disciplines (32.9% Nigeria; 75% South Africa), where the South African academics were more involved.

There were many similarities between the extent of sharing and the frequency of sharing among the surveyed academics with respect to workshops, conferences and seminars (86.3% Nigeria; 100% South Africa); information on new technology (89% Nigeria; 88% South Africa); research collaboration (88.6% Nigeria; 83.7% South Africa); and students mentoring (91.3% Nigeria; 100% South Africa). It would appear that the Nigerian academics shared this type of information and knowledge more frequently. In the area of research supervision, the South Africans were more focused (74.8% Nigeria; 100% South Africa), while information on scholarship opportunities was more frequently shared by the Nigerian academics (46.6% Nigeria; 23.9% South Africa).

7.2.6 Use of ICTs for information and knowledge sharing

Q6. What types of ICTs do the academics use for information and knowledge sharing?

The study revealed that the majority of the surveyed academics in both countries used computers, mobile phones, social media, USB drives, and Internet facilities. Based on the Technology Acceptance Model, this shows that they perceived these ICTs to be useful and easy to use. However, digital cameras/photos (81.3% Nigeria; 53.7% South Africa) and CD-ROMs (88.1% Nigeria; 23.9% South Africa) were mostly used by the Nigerian academics, while teleconferencing (17.4% Nigeria; 80.4% South Africa) and videoconferencing (13.3% Nigeria; 64.1% South Africa) were largely used by the South African academics. In the case of CD-ROMs, the implication is that many of the Nigerian academics had to use this rather outdated technology for lack of other options, in contrast to the South Africans who had access to the latest technologies. Fax machines (2.3% Nigeria; 44.6% South Africa) are found to be less used by the academics in both countries. It would appear that in the age of cell phones and email, this type of ICT is becoming obsolete with regards to information and knowledge sharing.

The trends in the frequency of use of ICTs by academics in both countries corresponded with the trends in the types used. The literature review revealed that ICTs

are found to be useful in knowledge management which involves the storage, processing, and sharing and knowledge (see Aina, 2004; Beebe, 2004; UNESCO, 2000); Jones (2007) explained the usefulness of ICTs such as web-portal in connecting researchers for sharing of ideas and especially in a university system; Abdullah et al. (2007) throws light on the benefits of ICTs in promoting knowledge sharing in universities and other higher institutions of learning. To summarise the survey revealed that ICTs, particularly common and useful ones such as computers and the Internet, are very much appreciated and used for information and knowledge sharing among the academics in the selected universities in Nigeria and South Africa. However, the use of more advanced ICTs has favoured the South African academics.

7.2.7 Effects of information and knowledge sharing on the academics

Q7. How does information and knowledge sharing affect the academics in their teaching, research, self-development and community services?

7.2.7.1 Effects on teaching

Academics in all fields strive towards achieving common goals, and these are to enhance their knowledge, investigate situations to determine outcomes, train others, and serve their immediate community for growth and development. No nation develops beyond its knowledge capacity, and this can only be widened through sharing.

The study established that the majority of surveyed academics in Nigeria viewed information and knowledge sharing to be a reliable source for improving lectures (76.3% Nigeria: 22.8% South Africa) and acquiring inputs and relevant materials (76.7% Nigeria: 20.7% South Africa). However it did not influence their teaching methods (23.3%) in contrast to the South African academics (87%). Academics from both countries did not feel that guidance for students' assessment (0% Nigeria; 0% South Africa) and allowing others to evaluate their classes (0% Nigeria; 0% South Africa) were effects of sharing. With the exception of teaching methods, the surveyed academics in South Africa did not feel that information and knowledge sharing had significant effect on their teaching. The Nigerian academics noted more effects of sharing on teaching.

7.2.7.2 Effects on research

The surveyed academics in Nigeria and South Africa agreed that sharing can be a motivating factor for research (100% Nigeria: 100% South Africa) and a means of communicating their research findings (100% Nigeria: 100% South Africa). There were also areas of disparity among the academics, especially relating to awareness about on-going research (36.5% Nigeria: 77.2% South Africa) and getting relevant inputs from colleagues (52.9% Nigeria: 100% South Africa). Overall, the South African academics were more positive than the Nigerians with respect to the effect of sharing on research.

7.2.7.3 Effects on Self-development

In terms of the effects of sharing on self-development, the majority of academics from both countries felt that sharing ia a means of keeping abreast of knowledge (100% Nigeria: 100% South Africa); bringing about enhanced productivity (90% Nigeria: 100% South Africa); gaining greater exposure in their area of expertise (80.8% Nigeria: 100% South Africa) and establishing wider collaboration (70.3% Nigeria: 100% South Africa). There was, however, a significant difference noted in opinion regarding acquiring information relevant to their field, where the academics in South Africa (47.5% Nigeria; 100% South Africa) were more positive. This suggests that the majority of academics from Nigeria did not view information sharing to be a means of acquiring relevant information to their fields, and this is rather contradictory considering that the majority had indicated that they shared information with colleagues in their disciplines and with others outside it.

There are significant benefits of sharing with respect to academics' self-development. It was found that the academics in the selected universities in both countries were positively affected by sharing as it helps them to keep abreast of knowledge, especially in their various fields. This triggers more research outputs through the acquisition of information relevant to their fields and establishing wider collaborative ties. It also shows the significance of knowledge sharing on the intellectual capacity development of the individuals through the provision of basic information and collaborative research initiatives for enhanced productivity.

7.2.7.4 Effect on community service

Information and knowledge sharing did not affect or influence the community service of most of the surveyed academics in Nigeria in the areas of improving community development (22.4% Nigeria: 79.4% South Africa). It also had no influence on developing effective community self-help techniques (31.5% Nigeria: 68.5% South Africa) and wider collaboration/involvement concerning community projects (30.7% Nigeria: 71.8% South Africa). All three had a significant effect on the South African respondents. It would appear that the majority of the academics in Nigeria did not engage in matters pertaining to community development. This suggests that sharing did not affect the academics in Nigeria with regards to community services. The majority of academics from both countries did not feel that information and knowledge sharing could motivate others to participate in community projects (46.6% Nigeria; 20.7% South Africa) and earning community recognition (35.2% Nigeria; 46.8% South Africa). The results show that there were significant differences in the effects of sharing on community engagements among academics in the two countries.

Supporting and improving community development educationally and socio-economically is one of the objectives of academic institutions, and these activities are planned and undertaken by all the individuals in society, including academics. The current study found that the majority of the academics in the selected universities in Nigeria were not of the opinion that information and knowledge sharing had any significant effects on community services, and this may in turn affect the academia-community relations in the country. In contrast the academics in the selected universities in South Africa largely indicated that information and knowledge sharing with their immediate communities has important benefits, especially with respect to improving community development, wider communication with members and improving community self-help techniques.

7.2.8 Challenges to information and knowledge sharing

Q8. What are the challenges to effective information and knowledge sharing?

The problems affecting information and knowledge sharing were much more pronounced among the surveyed academics in Nigeria. The Nigerian academics cited serious problems concerning the inadequacy of information resources (100% Nigeria; 14.2% South Africa) this implies that there is adequate provision of information resources in South African academic institutions against poor provision in Nigeria, and poor research management in the institutions (98.2% Nigeria; 0% South Africa). Both of these would affect academics' teaching and research processes. The problem extended to poor communication (95% Nigeria; 0% South African) about conferences, seminars and workshops which would probably explain why they are poorly attended (86.3% Nigeria; 14.1% South Africa). The responses of the academics in Nigeria regarding types of information shared and the types preferred where the majority indicated that they shared a lot of information on scholarships/bursaries and part-time, sabbatical and visiting, is possible proof of their need to supplement their requirements for funding. In South Africa, additional jobs and bursaries did not feature as problems. They also noted negative attitudes regarding the sharing of information (88.6% Nigeria; 39.1% South Africa) coupled with poor support and sponsorship (100% Nigeria; 0% South Africa).

These problems result in poor research output and delayed implementation of research findings. They also influenced the visibility of academic publications in Nigeria. For example, in Umaru Musa Yar'adua University (UMYU), the researcher observed that, there were up to eleven floating journals, but only two of these were subscribed to online sources. This is a serious issue in this era of globalization. The study established that there were significantly fewer problems relating to sharing among the academics in the selected universities in South Africa. This has a strong correlation with the fact that South Africa is placed above Nigeria in the ranking of research output in Africa by different agencies (Reuters, 2010).

7.2.9 Solutions towards effective information and knowledge sharing

Q9. What are the possible common solutions to the problems of information and knowledge sharing?

The survey revealed that there are many measures to take in order to curtail problems affecting sharing, especially in Nigerian institutions. The majority of surveyed academics from both countries agreed about the provision of adequate information resources (100% Nigeria; 100% South Africa), effective research management strategies (100% Nigeria; 100% South Africa) and institutional repositories (91.8% Nigeria; 100% South Africa) in the universities. They also mentioned timely communication about up-coming research gatherings (100% Nigeria; 100% South Africa), the provision of necessary research support (100% Nigeria; 100% South Africa) and effective research output through seminars, workshops and conferences (90.9% Nigeria; 100% South Africa) as common solutions to the problems of information and knowledge sharing. However, more Nigerian academics (93.6%) than South African academics (45.6%) felt that open access is a common solution to the problems afflicting information and knowledge sharing. Despite the fact that academics in South Africa experienced fewer problems, there is still a need for improvement in the country.

7.2.10 Research collaboration trends among the academics

Q10. What are the trends in research collaboration among the academics within the period of 2003 to 2013?

The data for this question was obtained from online database (Scopus), where all publications involving the six selected universities within the period of 2003 to 2013 were extracted and co-authorship was used to determine collaboration among and between academics from the universities three each from Nigeria and South Africa.

7.2.10.1 Research collaboration between the six universities

Q10.1 Is there any research collaboration between the six universities?

There was a significant amount of collaborative research involving academics in South African universities within the same university, with academics in other universities in the country, and with academics in universities in Nigeria. The collaborative networks

revealed that collaboration occurred much more between the academics in the selected South African universities than the academics in Nigerian universities, and there were more collaborative ties between the universities in South Africa than those in Nigeria. This correlates with the survey findings where the majority of the South African academics expressed that they shared information about their research progress with colleagues in their universities and with others from universities within the country while only a few of the Nigerian academics shared their research progress with others.

Q10.2.1 What is the co-authorship trend of the two countries?

The growth of co-authored papers in the selected universities in the two countries showed that there was a huge disparity in the number of collaborative publications being recorded per annum in favour of South Africa. The steady increase in the number of co-authored papers annually indicated the magnitude of collaboration per country; the Nigerian and South African output in 2003 was 66 and 52 respectively which grew to 298 for Nigeria and 1,731 for South Africa in 2013. This suggests that there were more research output in the selected universities in South Africa due to better research support/sponsorship and management from the institutions as highlighted in the survey results in contrast to the Nigerian universities.

Q10.2.2 What is the growth of co-authored papers of the collaborating universities?

The trend in co-authored papers within the selected universities in Nigeria was very low compared to the universities in South Africa. By comparing the two most productive universities in the countries, ABU and UKZN, it was discovered that there was a huge difference in terms of the number of publications by two or more authors, In 2003, there was a record of 66 publications for ABU and 12 for UKZN, and thereafter the numbers grew to 281 for ABU and 1,556 for UKZN. This shows that the trend in the growth of collaborative research within the universities in Nigeria is lower than the trend within the universities in South Africa; even a comparison of the least productive universities in collaborative research in both countries was in favour of the South African institutions.

7.2.10.2 Research collaboration among academics in the selected universities

Q10.3 How do the countries compare in research collaboration?

There was a significant relationship noted in the ratio of single- to co-authored papers in the universities in both countries for the study period, where the co-authored publications considerably outnumbered the single authored publications. There was an increase in this ratio through the period of study, which indicates that collaborative papers increased more than single-authored papers in both countries. The aggregate total of single and co-authored papers of the Nigerian universities was 28 and 66 respectively in 2003, and this grew to 15 and 298 respectively in 2013. Closer examination reveals that the single-authored papers have even declined compared to the previous year. The aggregate total of single- and co-authored papers of the South African universities in 2003 was 11 and 52, and by the end of the study period they grew to 324 and 1,731 respectively, In the case of South Africa, the growth trend increased in both single- and co-authored publications.

7.2.10.3 Country and universities' strength and degree of collaboration

Q10.4 What are the country and selected universities degree of collaboration within the period of study?

The measure of strength and degree of collaboration was calculated to determine the percentages of both single- and co-authored papers from the total number of publications in the selected universities in each country. Subramanyam's mathematical formula states that the higher the ratio of co-authored papers over single-authored papers the greater the degree of collaboration. In this case, the trend is in favour of Nigeria, where the percentage of total co-authored papers was higher than the percentage of single-authored papers by a larger margin than the universities in South Africa. The percentages were 9.27% for Nigeria and 15.93% South Africa for single-authored publications, and 90.73% and 84.07% for Nigerian and South African publications respectively.

The average number of authors per paper from the six selected universities was also more in favour of Nigeria due to the higher percentage of co-authored papers,

especially in the case of UMYU were all (100%) of the publications within the period of study were published by more than one author. UMYU's average author per paper was 5.70, and degree of collaboration of 1.00, which is also the highest among the universities in Nigeria and South Africa. This is despite that UMYU produced the least number of papers of all the universities for the study period.

7.2.10.4 Research collaboration trends within the period of study

Q10.5 What are the trends in research collaboration within the period of study?

7.2.10.5.1 Areas of collaboration between the two countries

The study revealed that collaborative research between university academics in Nigeria and South Africa cut across many disciplines. Out of the twenty seven areas of collaborative research identified within the period of 2003 to 2013, Medicine topped the list followed by Social Sciences. Other areas of collaborative research include Agriculture and Biological Sciences, Biochemistry and Genetics, Immunology and Microbiology while the least areas of collaboration were Health Sciences, mathematics and Dentistry. This suggests that collaborative research between academics from the two countries cut across many disciplines.

7.2.10.5.2 Types of publications used for collaboration

The types of documents used to publish collaborative research between academics from Nigeria and South Africa within the period of study primarily consisted of articles, reviews, books, book chapters, conference papers and editorials. Among these, journal articles were the most popular followed by reviews and conference papers. The type of documents used to for collaborative research between academics from the two countries correlates with the survey data, which revealed that most academics in both countries share information during seminars, workshops and conferences. This also shows that the academics from the two countries have been collaborating in research within their countries and with other academics between the two countries.

7.2 10.5.3 Top twenty collaborating authors between universities from the two countries

The number of publications by individual authors was captured in order to determine the top twenty most collaborating authors between universities from the two countries. From the data, the top seven most productive authors were from South African universities, and the highest contributing author was Loto C. A. from Tshwane University of Technology Pretoria, with eight (8) publications. This shows that during study period, the academics in South Africa were being more collaborative internationally than their Nigerian counterparts. The results correlates with the survey responses by the academics about their extent of collaboration where the South African academics indicated wider collaboration ties with others outside their discipline and abroad more than the Nigerians.

7.2.10.5.4 Top twenty collaborating universities

The highest collaborating universities were also identified and the top twenty listed. It was established that the top two collaborating universities were the University of Ibadan and Obafemi Awolowo University, which are both from Nigeria. Also among the twenty top collaborating universities, twelve were from Nigeria while eight were from South Africa.

7.2.10.6 Influence of research collaboration on research impact using co-authored papers

Q10.6 What is the influence of research collaboration on research impact using co-authored papers?

The number of citations per paper determines the relevance and impact/influence of the research findings. The number of citations received by single- and co-authored papers in the selected universities in the two countries shows that co-authored papers have more of an impact on research collaboration than single-authored papers. This also shows that most academics in the two countries engage more in collaborative than individual research, and correlates with the survey findings where the majority of academics in both countries indicated that they understood and participated in information and knowledge sharing. There was also a clear margin in the percentage of

single-authored papers to co-authored papers, which was higher in South Africa. Furthermore, the average number of citations received by the co-authored papers in the selected universities in South Africa was 8.98 against the average citation of 3.77 in Nigeria. This shows that the influence of research collaboration on research impact is higher in South Africa.

7.2.10.7 Relationship between research collaboration and knowledge sharing

Q10.7 What is the relationship between collaboration and information and knowledge sharing?

The aggregate of all the activities investigated revealed a great deal about the academics' understanding, involvement, extent of participation, ICT use and collaborative practices in the universities and countries under study. The study also identified the major areas of impact and challenges to effective practice and possible solutions therein. The sum of all the data proves that there is a strong relationship between research collaboration information and knowledge sharing. It has proven that the more that an individual academic collaborates, the more that he/she stands to occupy a central position in his/her field of expertise and the wider the coverage of his/her research findings. It also proves that information and knowledge are shared more through collaboration because the coming together of different academics brings about wider intellectual input from diverse perspectives, and accommodates more views for universal common standing. university or a country is, the more they occupy a central position in their field of expertise and the widely the coverage of the research findings thereby sharing knowledge beyond boundaries, it has also proven that knowledge is more shared through collaboration as the coming together of different actors brings about wider intellectual input from diverse perspectives and accommodating more views for universal common stand and thereby enriching quality control and knowledge enhancement.

7.3 Summary

Chapter seven discussed the study's findings and highlighted possible relationships and disparities in the information and knowledge sharing practices of the academics in selected universities in Nigeria and South Africa. The data obtained from the study was discussed in relation to available literature and the theories adopted for the study, which are Social Capital (SCT) and Technology Acceptance Model (TAM). The summary and conclusions in the next chapter (8) are informed by the issues discussed in this chapter.

CHAPTER EIGHT

SUMMARY, CONCLUSION AND RECOMMENDATIONS

8.0 Introduction

This chapter summarizes the findings of this study in relative to the research objectives, presents the conclusions of the study and provide appropriate recommendations for efficient and effective information and knowledge sharing in the selected universities in Nigeria and South Africa. The chapter also suggests some useful areas for further research in relation to the problem under investigation.

The research was undertaken to compare the information and knowledge sharing activities among academics in selected universities in Nigeria and South Africa with a view to finding the similarities, differences in practice, and the trends in collaborative efforts between the universities. The survey research method was employed in this study, and the questionnaire was used to collect raw data from academics in selected universities in Nigeria and South Africa. In Nigeria, data was obtained from Ahmadu Bello University Zaria, the Federal University of Technology and Umaru Musa Yar'adua University. The South African universities consisted of the University of KwaZulu-Natal, Durban University of Technology and University of Zululand.

A total of 219 academics from Nigeria and 101 academics from South Africa were sampled for the study. 281 and 92 questionnaires were returned from Nigeria and South Africa respectively. The online database Scopus was used to obtain the Bibliometric data to study the collaboration trends among the academics in the selected universities using co-authorship as a measure.

The data collected was supplemented with a literature review and personal observation. The questionnaire elicited respondents' demographic data; their understanding of information and knowledge sharing; types of information and knowledge shared; reasons for information and knowledge sharing; patterns of sharing; types of ICTs used for information and knowledge sharing; effects of information and knowledge sharing on the academics; challenges of information and knowledge sharing; and possible solutions for effective information and knowledge sharing; A separate chapter was

dedicated to determining the research collaboration trends among the academics in the selected universities in the two countries..

The majority of the respondents from Nigeria (74% male; 26% females) and South Africa (70.7% male; 29.3% female) were male. The respondents were categorized into three main disciplines (Humanities, Natural Sciences and the Applied Sciences) and the results revealed that most of the respondents were in the Humanities (57.1% Nigeria; 41.3% South Africa), followed by the Natural Sciences (27.9% Nigeria; 31.5% South Africa), while the smallest group was from the Applied Sciences (15.1% Nigeria; 27.2% South Africa) in both countries. The highest educational qualification of the majority of respondents was Masters' degree, followed by a PhD and Bachelor's degree, and the trend was uniform in both countries. However the percentage concentration of Masters' (52.5% Nigeria; 51.1% South Africa) and Bachelors' (17.4% Nigeria; 6.5% South Africa) degrees was more in favour of Nigeria, while the PhD (30.1% Nigeria; 42.2% South Africa) percentage was higher in South Africa.

The majority of the respondents (42%) and (53.3%) in Nigeria and South Africa had between 11 to 20 years of experience in academia. The second highest percentage of respondents (26.6% Nigeria; 26.1% South Africa) had between 21 to 30 years' experience, while the least percentage (7.3% Nigeria; 3.3% South Africa) had over 30 years' of experience.

8.1 Summary of the study

The summary is organised according to the research objectives and questions.

8.1.1 Objective 1: To explore the types of information and knowledge shared among academics in selected universities in Nigeria and South Africa

The research question driven by this objective was:

8.1.1.1 Q1. What type of information and knowledge do the academics share?

The hypothesis formulated to support this question was:

8.1.1.2 Ho1. There is no significant difference in the types of information and knowledge shared among the academics

Walczak (2005) asserts that the global trend in development has shifted from the industrial to the knowledge economy, which explains Aliyu's (2007) observation that academics in Africa have embraced knowledge sharing for competitive advantage. However, Reuters (2010) revealed that the African trend in knowledge sharing is below average compared to global standard. In essence there were divergent views by many scholars regarding information and knowledge sharing among university academics on the African continent.

The study determined that all of the surveyed academics in the selected universities in the two countries (100% Nigeria; 100% South Africa) understood the concept and value of information and knowledge sharing and they do strongly participated in the process through various platforms and academic gatherings. In both countries, the main type of information and knowledge shared by the surveyed academics was information on conferences, seminars and workshops (100% Nigeria; 100% South Africa) and information on new technologies (100% Nigeria; 100% South Africa). However information on scholarship primarily shared by the South African respondents (54.4% Nigeria; 75% South Africa), and information on part-time, visiting and sabbatical jobs was shared by significantly more Nigerian respondents (86.3% Nigeria; 8.7% South Africa). In summary there was a relationship in the types of information and knowledge shared among academics in the selected universities in Nigeria and South Africa as confirmed by the first hypothesis (Ho1) tested using T-test were the calculated value of P = 0.313 was greater than the alpha value of 0.05.

8.1.2 Objective 2: To determine the reasons for information and knowledge sharing

The research question was:

8.1.2.1 Why do academics share information and knowledge?

The hypothesis formulated to support this question was:

8.1.2.2 Ho2. There is no significant difference in the reasons for information and knowledge sharing among the academics in selected universities in Nigeria and South Africa

The study identified similarities in the reasons for information and knowledge sharing among the respondents, as pointed out by the majority, in the areas of improving research output (94.1% Nigeria; 100% South Africa) and supporting research activities (91.3% Nigeria; 100% South Africa). Improving collaboration was also common reason among the academics (78.1% Nigeria; 100% South Africa). Collaboration is important as it brings about familiarity with others in one's field, and makes one more current in one's discipline.

There are significant disparities in other reasons for sharing among the respondents, as highlighted in the table, in the areas of being familiar with others in their discipline (69.4% Nigeria; 100% South Africa), to improve collaboration (78.1% Nigeria; 1100% South Africa) and to uncover new ideas (88.6% Nigeria; 100% South Africa) were seen as reasons for sharing information and knowledge by larger percentage of the South African academics than the Nigerians. remaining reasons such as to improve collaboration were South Africans are found to be sharing knowledge on collaboration more than the Nigerians this attitude brings about familiarity with others in their field which make them more current in their discipline. The results proved that South African academics are more popular among their peers and collaborate to produce more research outputs than the Nigerians. This shows that, when academics share more information and knowledge with others especially in collaborative research, their popularity and recognition among colleagues increases. The hypothesis tested using T-test regarding the difference on their reasons for information and knowledge sharing also shows significant difference where the obtained value of P= 0.000 is less than the

alpha value of 0.05. This means that there is a strong disparity in the reasons for knowledge sharing among academics in the selected universities in Nigeria and South Africa.

8.1.3 Objective 3: To determine the ways and extent of information and knowledge sharing

The research questions driven by this objective were:

8.1.3.1 How do academics share information and knowledge?

8.1.3.2 How often do academics share information and knowledge?

The hypothesis to support these questions was:

8.1.3.3 Ho3. There is no significant relationship in the pattern of information and knowledge sharing among academics in the selected universities in Nigeria and South Africa

There are a number of ways through which information and knowledge can be shared among individuals and groups. Formal academics gatherings are reported to be the most widely used avenues for knowledge sharing, and these platforms are also used for communicating research findings and results (Gamble, 2002; Walsh et al., 2007).

The current study revealed that the majority of the surveyed academics in the selected universities in the two countries had similar information and knowledge sharing patterns. The major ways of sharing in Nigeria and South Africa as noted by the respondents were with academics in their fields (82.6% Nigeria; 100% South Africa), during seminars workshops and conferences (93.6% Nigeria; 100% South Africa), and with other academics in their countries (79% Nigeria; 85.9% South Africa). The differences are quite insignificant. The hypothesis tested using correlation to measure the trend also proved that there are strong similarities among academics in the selected universities with respect to patterns of sharing. The calculated rho value was 6.823 and the P value of 0.000 was less than the alpha of 0.05 meaning that the sharing patterns of academics in the selected universities in Nigeria and South Africa are similar. Therefore, the sharing pattern of academics in the study areas is similar.

The majority of the respondents in the selected universities in both countries were found to be extensively and frequently sharing knowledge with their colleagues through personal discussions (84.5% Nigeria; 100% South Africa), during seminars, workshops and conferences (95.9% Nigeria; 100% South Africa); before undertaking research (62.3% Nigeria; 77.2% South Africa), on research collaboration (88.6% Nigeria; 83.7% South Africa), and students mentoring (91.3% Nigeria; 100% South Africa). However the Nigerian academics shared more information on additional jobs (90.4% Nigeria; 35.9% South Africa; and on scholarship availability (46.6% Nigeria; 23.9% South Africa) while the South Africans academics shared more information on research supervision (74% Nigeria; 100% South Africa), with those outside their discipline (32.9% Nigeria; 75% South Africa) and on their research progress (46.6% Nigeria; 89.1% South Africa).

8.1.4 Objective 4: To explore the types of ICTs used for information and knowledge sharing

The research questions driven by this objective were:

8.1.4.1 Do you use ICTs for information and knowledge sharing?

8.1.4.2 What types of Information and Communication Technologies (ICTs) do the academics use for information and knowledge sharing?

Information and Communication Technologies (ICTs) have infiltrated and influenced all sectors of human endeavour. Today, it is widely accepted and believed that the viability and effectiveness of any system, be it individual, organisational or societal, is largely dependent on the application and use of these technologies for competitive advantage. ICTs are vital components of academic systems especially for knowledge processing and transfer. Studies have reiterated the importance of such tools in knowledge management for effectively influencing the storage and transfer of information and knowledge for posterity; these tools also facilitate easier and quicker access to knowledge regardless of time or location (Aina, 2004; Beebe, 2004).

The majority of academics in the selected universities in the two countries were found to be extensively using ICTs such as computers (100% Nigeria; 100% South Africa), mobile phones (100% Nigeria; 100% South Africa), social media (87.3% Nigeria; 100% South Africa), USBs drive (100% Nigeria; 100% South Africa), the Internet (100%

Nigeria; 100% South Africa) and digital cameras (81.3% Nigeria; 53.7% South Africa). The academics from Nigeria were more inclined to using CD-ROMs (88.1% Nigeria; 23.9% South Africa) than the South Africans. The study also found that in the selected universities the most advanced ICTs, such as teleconferencing (17.4% Nigeria; 80.4% South Africa), videoconferencing (13.3% Nigeria; 64.1% South Africa) were being utilised by the South African academics, while the Nigerians academics were more inclined to use the most popular gadgets, such as computers and mobile phones.

8.1.5 Objective 5: To investigate the effects of information and knowledge sharing

The research question was:

8.1.5.1 How does information and knowledge sharing affect the academics in their teaching, research, self-development and community services?

The hypothesis to support this question was:

8.1.5.2 Ho4. Information and knowledge sharing has no significant effect on the academics in the selected universities in Nigeria and South Africa in their teaching, self-development and community services.

This study found that knowledge sharing affects the academics in the selected universities in the two countries in various ways. The Nigerian academics revealed that information and knowledge sharing is a reliable source for academics to improve their lecture notes (76.3% Nigeria; 22.8% South Africa) and acquiring relevant materials for their lectures (76.7% Nigeria; 20.7% South Africa) , while the South African academics felt strongly that it influences their teaching methods (23.3% Nigeria; 87% South Africa). However, there is a common ground with respect to guidance in assessing students (0% Nigeria; 0% South Africa) and allowing others evaluate their class (0% Nigeria; 0% South Africa), which were not considered to be effects on teaching by the respondents in both countries.

The results concerning the effects of sharing on research revealed similarity in the selected universities in the two countries concerning sharing as a motivating factor for research (100% Nigeria; 100% South Africa) and a means of communicating research findings (100% Nigeria; 100% South Africa). However, the surveyed Nigerian

academics did not believe that information and knowledge sharing influences communications and awareness about on-going research (36.5% Nigeria; 77.2% South Africa) and getting relevant inputs from colleagues (52.9% Nigeria; 100% South Africa) , in contrast to the South African academics who believed that the effects are considerable.

There are significant benefits of sharing with respect to academics' self-development. It was found that the academics in the selected universities in both countries were positively affected by sharing as it helps them to keep abreast of knowledge (100% Nigeria; 100% South Africa) especially in their various fields. This triggers more research outputs through the acquisition of information relevant to their fields (47.5% Nigeria; 100% South Africa) and establishing wider collaborative ties (70.3% Nigeria; 100% South Africa). It also shows the significance of knowledge sharing on the intellectual capacity development of the individuals through the provision of basic information and collaborative research initiatives for enhanced productivity.

The current study found that the majority of the academics in the selected universities in Nigeria were not of the opinion that information and knowledge sharing had any significant effects on community services. In contrast the academics in the selected universities in South Africa largely indicated that information and knowledge sharing has important benefits, especially with respect to improving community development (22.4% Nigeria; 79.4% South Africa), wider communication with members (30.7% Nigeria; 71.8% South Africa) and improving community self-help techniques (31.5% Nigeria; 68.5% South Africa).

The data obtained concerning the effects of sharing was subjected to a hypothesis testing using correlation, and the results obtained were a rho value of 0.861 and P value of 0.000, which is less than the alpha value of 0.05 for Nigeria and a rho value of 0.967 and P value of 0.000 which is also less than the alpha value of 0.05 for South Africa. These results showed significant effects of sharing on teaching, research, self-development, and community service among academics in the selected universities in both countries.

8.1.6 Objective 6: To examine the challenges to effective information and knowledge sharing

The research question driven by this objective was:

8.1.6.1 What are the challenges to effective information and knowledge sharing?

It was found that the Nigerian academics in the selected universities are experiencing a lot of problems that affect information and knowledge sharing. The problems the respondents from Nigeria cited ranged from inadequacy of information resources (100% Nigeria; 14..2% South Africa), to poor research management (98.2% Nigeria; 0% South Africa), poor communication regarding conferences, seminars and workshops (95% Nigeria; 0% South Africa), poor attendance of conferences, seminars and workshops (86% Nigeria; 14.1% South Africa), negative attitude towards sharing by the academics (88.6% Nigeria; 39.1% South Africa), and poor support and sponsorship (100% Nigeria; 0% South Africa). These problems were found to have virtually no effect on the information and knowledge sharing of the academics in the South African universities. This shows that there is a significant difference in the standard of knowledge sharing in the selected universities in the two countries, and that the South African academics definitely have a greater advantage in terms of research management and support over the Nigerian academics. This may be one of the reasons why various studies have placed South African above other countries in Africa with respect to research output and collaborative ties. Visibility of research results in this era of globalisation is also a determinant factor in the ranking of universities and countries in research and collaboration.

8.1.7 Objective 7: To proffer solutions towards effective information and knowledge sharing

The research question driven by this objective was:

8.1.7.1 What are the possible common solutions to the problems affecting information and knowledge sharing?

The current study has found that there are a number of solutions to adopt towards limiting the effect of the problems affecting information and knowledge sharing. Despite

the severity of the problems of sharing especially in Nigeria, majority of the academics in both countries believed that provision of adequate information resources (100% Nigeria; 100% South Africa) in academic libraries will ensure access to knowledge needed for studies and facilitating research activities, there should also be a functional research management policy (100% Nigeria; 100% South Afric) and strategy to augment the efforts of individual scholars and highlight useful areas of assistance. The provision of open access facilities and databases (93.6% Nigeria; 45.6% South Africa) will go a long way in providing a substantial amount of literature needed for research coupled with timely communication on upcoming formal academic gatherings (100% Nigeria; 100% South Africa) among the researchers. There are needs for support services to the academics (100% Nigeria; 100% South Africa) to undertake researches in various areas by Government and other organisations such as bursaries and sponsorships. The universities are also needed to develop and provide access to institutional repositories (91.8% Nigeria; 100% South Africa) for free and unrestricted flow of information through knowledge management.

8.1.8 Objective 8: To analyse the research collaboration status in the selected universities in the two countries as a factor for knowledge sharing

The research question driven by this objective was:

8.1.8.1 What is the status of research collaboration among the academics in the selected universities for the period of 2003 to 2013 as a factor of information and knowledge sharing?

As alluded in chapter six this objective was geared towards understanding the collaborative status and trends among academics in the study areas and to uncover the differences concerning research collaboration within their universities, between their universities in their countries and with other universities from the two countries. The study covered collaborative practices within the period of 2003 to 2013 in six selected universities, three each in Nigeria and South Africa.

The study revealed that during the study period (2003 – 2013) there were collaborative ties between academics within the selected universities in Nigeria, but there were a limited number of collaborative studies between academics from two or more universities within the country. The Nigerian academics were also limited regarding

collaboration with colleagues from South Africa. The study further revealed that the academics in the selected universities in South Africa engaged in collaborative ties within their universities, with others in their country and also with those from Nigeria. It was determined that the South African academics in the selected universities had more collaborative research ties domestically (within and between universities) from 2003 – 2013.

The study revealed a huge difference in the trend of aggregated co-authored papers per annum of the selected universities in each country for the study period; in Nigeria the co-authored papers grew from 66 in 2003 to 298 in 2013, while in South Africa the growth was from 52 publications in 2003 to 1,731 in 2013. This shows the increase in participation and awareness regarding collaborative research output, especially in the South African universities. The highest collaborating universities among the selected universities in Nigeria and South Africa respectively for the study period were Ahmadu Bello University Zaria (ABU) and University of KwaZulu-Natal (UKZN) with a total of 2,181 and 9,292 co-authored papers respectively within the period of study. the results showed that UKZN produced 400% more co-authored papers than ABU.

The strength and degree of collaboration were calculated to determine the percentage of single to co-authored papers in both countries, and the results were 9.27% to 90.73% for Nigeria and 15.93% to 84.07% for South Africa. The major areas of collaboration between universities from the two countries were in Medicine (198), the Social Sciences (162), and Agriculture and the Biological Sciences (116), while the least collaboration was in Mathematics (2) and Dentistry (2). The types of documents used for communicating/disseminating collaborative research results between universities from the two countries were journal articles (514), reviews (35), conference papers (26), book chapters (18), editorials (3) and book publishing (1).

The data for the most collaborating authors from the two countries was processed and it was determined that the top eight most collaborating authors out of twenty were from South Africa. Loto C.A. from Tshwane University of Technology in Pretoria, South Africa, emerged as the highest collaborating author, with eight publications within the period of study. The data for most collaborating university from the two countries was also processed and the top two most collaborating universities out of twenty were the

University of Ibadan and Obafemi Awolowo University, both from Nigeria, with 60 and 44 collaborative publications respectively.

The study also established the relationship between research collaboration and research impact using co-authored papers. The study determined that the number of citations received by co-authored papers was more than the number of citations received by single-authored papers in the selected universities and countries for the period of study. The magnitude was lower in Nigeria than in South Africa, showing the average citations per co-authored paper to be 3.77 and 8.98 respectively, which means that collaborative research had more of an influence on research impact in the South African universities.

Thus, the study revealed the relationship between research collaboration and information and knowledge sharing, and supports the notion that the more that a single individual, institution or country embarks on collaborative ties with others, the more knowledge is shared; the level of collaboration determines the level and amount of knowledge shared.

8.2 Conclusion

This section provides the conclusions driven by the empirical study of information and knowledge sharing among academics in selected universities in Nigeria and South Africa.

The majority of the study's respondents from the selected universities in the two countries were males, and they were dominant by a high percentage across all disciplines to the extent that for every 1 female academic, there were about 3 to 4 males. The surveyed academics were also more concentrated in the Humanities disciplines, followed by the Natural Sciences, with the least number of academics in the Applied Sciences. Comparatively, there were a greater percentage of academics in the Natural and Applied Sciences in South Africa.

The majority of the surveyed academics had Masters, degrees as their highest qualification, followed by PhDs and Bachelors' degrees. The trend was similar in both countries, but comparatively there were more Masters' and Bachelors' degree holders among the Nigerian respondents, while the percentage of PhDs was higher in selected

universities in South Africa. The majority of the respondents in both countries had between 11 to 20 years of experience, followed by 21 to 30 years, and only a minimum number of the academics had over 30 years' experience. The trend was uniform in both countries.

It was found that information and knowledge sharing is a familiar concept among the academics in the selected universities and that they participate in knowledge sharing in various capacities and platforms, such as during seminars, workshops and conferences. It was also found that there is a lot of similarity in the types of knowledge shared among the academics in the selected universities in both countries. Academic gatherings bring together many academics from different countries and disciplines for inter-disciplinary exchange and cross-pollination of ideas.

The major ICTs such as computers, mobile phones, internet facilities, television, and digital cameras/photos were found to be used extensively by academics in the selected universities in Nigeria and South Africa for information and knowledge sharing while the most advanced ICTs such as teleconferencing and video conferencing were much more utilized by the South African academics. Information and knowledge sharing has significantly been effective to the academics in the selected universities in Nigeria in their teaching activities especially in the areas of improving their lectures, getting relevant materials and teaching methods while the academics in selected universities in south Africa did not feel that information and knowledge sharing had significant effect on their teaching. Information and knowledge sharing have had a significant effect on the academics in the selected universities in both countries especially as a motivating factor for research, means of communicating research findings but comparatively the South African academics were more positive than the Nigerians with respect to the effect of sharing on research. There were significant similarities in terms of the effects of sharing on the majority of academics from both countries as it a means of keeping abreast of knowledge, brings about enhanced productivity, greater exposure and establishing wider collaboration while there are areas of disparity where the academics from South Africa found information and knowledge sharing as a means of acquiring relevant information to their field in contrast to the academics from Nigeria. The surveyed academics in Nigeria were not affected by information and knowledge sharing with regard to improving community development, wider involvement concerning community

projects while all three had a significant effect on the South African respondents. the academics were not affected by sharing in the areas of participation in community projects and earning community recognition.

The study revealed that there are many challenges to information and knowledge sharing especially as noted by academics in the selected Nigerian universities. The Nigerian academics cited the poor supply of infrastructure and utilities such as electricity, inadequacy of information resources, including both print and electronic sources, poor research management and support, poor communication and attendance in conferences, seminars and workshops, and poor attitudes towards sharing among the academics. While the surveyed South African academics indicated that they were not significantly affected by these problems which suggest that they enjoy more privileges with respect to support and administrative processes towards improving their research output. This proves the reasons for the performance of South Africa in research output, and why it is placed above Nigeria in terms of performance among other countries in Africa.

The common solutions towards ensuring effective and efficient knowledge sharing among the academics, as revealed in the study, are: provision of adequate information resources, including electronic sources; ensuring a functional research management system that will provide the academics with the necessary equipment and support (e.g. sponsorship and bursaries); routine organisation of academic gatherings for the dissemination of research results and timely communication to that effect; and improved awareness among academics regarding the importance of knowledge sharing to improve participation. These solutions were found to be common to solving the identified problems in Nigeria and improving the research status in South Africa.

There is a need for improvement in the provisions and management of research support in South African as studies (Reuters, 2010) have noted that, despite the advantage that the South Africans have over African countries, including Nigeria in terms of research output, their performance is below standard in global comparison.

The study also revealed that collaborative research is very minimal among the academics and universities in Nigeria compared to South Africa, and therefore the South African academics are more productive in terms of collaborative research output.

The South African academics produced more collaborative research publications from 2003 – 2013 (2,222 Nigeria; 10,347 South Africa).

This and many other reasons, as highlighted above are found to be responsible for the ranking of Nigeria and its universities behind South Africa in terms of research output. This also determines the relationship between research collaboration and research impact, where South African academics are seen to be more productive than the Nigerians academics due to more collaborative engagements, which in turn bring about wider participation, visibility and recognition globally.

The Bibliometric analysis revealed that the major areas of collaboration among the Nigerian and South African academics for the period of 2003 – 2013 were in Medicine, which topped the list with highest number of collaborative research, followed by the Social Sciences, Agriculture and the Biological Sciences, while the least areas of collaboration were in Mathematics and Dentistry. The collaborative publications were mostly journal articles, followed by book reviews and conferences papers. The top collaborating author in the two countries was Loto C.A. from Tshwane University of Technology in South Africa, while the top collaborating universities were the University of Ibadan and Obafemi Awolowo University, both from Nigeria.

Despite the above discoveries, the study fell short of ascertaining a clear cut indication of the elements and activities of information and knowledge sharing and detailed collaborative practices regionally and internationally; and could not make comparison to advanced nations' universities to bring to light the efforts and status of the African academics with regards to global sharing and collaborative efforts. This was principally due to limited time and resources. The study also could not examine the institutional capacities of the universities with regards to assisting the academics financially, and the policies that are in place to support academic practice. These are areas that need to be examined, as they may also be the reasons for the backward position of African researchers. However, the study achieved its primary stated objective, which was to uncover and compare the practices of academics in a few selected universities in the two African countries (Nigeria and South Africa). This is a step in the right direction, and further studies can be embarked upon to expand to the areas as suggested above.

8.3 Recommendations

Objective 1: To explore the types of information and knowledge shared among academics in Nigeria and South Africa

To be able to move towards improved sharing activities, there is a need for an in-depth analysis and evaluation of the information literacy levels of the academics in the selected universities with respect to hands-on skills. An individual may be educated to the level of PhD, but their ability to search for, retrieve, process, store and share information may be poor. This researcher observed and listened to many verbal confessions during the course of data collection, where many academics in the selected institutions comment on their urge for training on information retrieval skills, especially in Nigeria. This will surely improve their capacity to seek and share information and knowledge.

Irrespective of the type of information or knowledge that academics share they need to understand and be equipped with contemporary information seeking and retrieval techniques. Hence there is an urgent need for the training and retraining of academics by university authorities, as well equipping the academics with the required modern tools and internet connectivity for effective sharing. In essence, training and development is urgently required to improve the information literacy levels of the academics in both countries. The training and development of literacy skills will surely transform and widen the sharing horizons and collaboration among the academics.

The study suggests that the Federal Ministry of Education, in conjunction with various state ministries and the Tertiary Education Trust Fund (TETFUND) in Nigeria, should reinvigorate their efforts through collaboration with the Nigeria University Commission (NUC), the National Examinations Council (NECO), and all public and private universities in the country, to come up with research and ICT training programmes for capacity building, such as the Advanced Digital Appreciation Programme Tertiary (ADAPT) currently being run in the country, which is not being given enough coverage. Together, they need to provide and emphasize the necessity of digital training of academics from grass roots level to nurture the ability of individuals to adopt and use ICTs for research and innovation country-wide. These agencies should also ensure and increase the provision of necessary support and sponsorship for grass-root and

advanced research collaboration efforts both locally and internationally in all fields. An example is the Petroleum Technology Development Fund (PTDF) which caters for studies and research related to petroleum technology.

There should also be the provision of basic amenities, such as an uninterrupted power supply in the country and an enabling environment for research activities, to attract foreign researchers and investors in scientific and social sciences research. This will in no doubt widen the horizon of collaborative research in the country, thereby increasing the universities output, coverage, participation, and improved ranking both regionally and globally.

The situation among academics in selected universities in South Africa may be better than Nigeria, but there are areas of concern, such as the minimum requirement system for teaching and employment being practiced in the country which, to a large extent, undermines and compromises quality and professionalism. This could serve to explain why many academics in South Africa, as observed during the course of data collection are from other countries. While the integration of foreign elements brings about diversity and wider perspectives in teaching and research, it can also spell a shortage of capacity in terms of manpower in the academic arena.

South Africa possesses the potential to push collaborative research and improve output to a much higher level than Nigeria, but the government needs to revisit the various policies of employment, especially in academic institutions. This and more can be done through agencies like the South African Qualifications Authority (SAQA) where qualifications are evaluated to ascertain the suitability and relevance of individuals' contribution to the system. Backed by law, the Council for Higher Education (CHE), in conjunction with the Department of Education (DoE) should impose strict measures to ensure quality teaching and research in the country by insisting that citizens obtain a Master's Degree as their minimum qualification if they are interested in academia, and this should be supported by providing enticing remunerations for successful candidates to attract more quality academics. Ideally, researchers should earn more rewards, and this would attract more competent individuals to the academia as against the current situation where many administrators earn more than academics as the case may be.

Objective 2: To find out the reasons for information and knowledge sharing

The reasons for information and knowledge sharing among academics in the selected universities in both countries were found to be similar, but the comparison of their research output globally is low. Hence there is a need for an in-depth analysis of global information and knowledge sharing practices and standards, as this study only compared two countries in a bid to determine why South Africa is placed above Nigeria in terms of research output in Africa. Therefore, the governments in both countries need to revisit the funding policies of the universities with a view to revitalise the essence and objectives of higher institutions as enshrined in the laws of the land, especially in Nigeria where the situation is at a critical stage. The proper funding and support for academic institutions would enhance their productivity, which would help them gain the competitive advantage to compete in the global arena.

Objective 3: To determine the ways and extent of information and knowledge sharing

Academics explore different ways and patterns for communicating and sharing their knowledge with others depending on the situation and environment in which they find themselves, but there are global standards if the objectives of teaching and research are to be achieved. The patterns and extent of information and knowledge sharing among the academics in the selected universities in Nigeria and South Africa were found to be similar, but South Africa is still placed above Nigeria in university research rankings, and both countries placement is below average in global comparison. A closer look at the results reveals that the academics cited interacting with their colleagues during seminars, workshops and conferences, as their most explored avenue for information and knowledge sharing, and yet these platforms are poorly attended due to poor communication and funding especially as it affects the academics from Nigeria. Many academics fail to communicate their research findings, not because they do not want to, but because they do it in less formal ways, and this is as a result of the poor support and management from the authorities, coupled with a negative attitude to sharing that the academics develop leading to poor participation. All these are revealed by this study.

There is a need for tighter measures to ensure sustained research output by the academics through the re-introduction and imposition of policies to persuade individual academics to be more productive in both their individual and collective capacities, such as the publish or perish system. The government and university authorities in both countries must look into the productivity of the academic institutions and venture into rewarding them based on performance. This is already being done in South Africa, even though it should be increased to improve the standard, while the lackadaisical situation in Nigeria should be arrested through tighter publish or perish policies that are based on global standards. This would influence participation in and the exploration of sharing avenues and platforms in greater measures to meet the demand.

Objective 4: To explore the types of ICTs used for information and knowledge sharing

The importance and relevance of ICTs alone cannot influence their utilization; there needs to be availability, affordability, accessibility and usability. There is wide acceptance and utilisation of the most common ICTs by the academics in the selected universities in both countries, as revealed in the study, but as observed during visits for data collection in Nigeria most of these resources are either obsolete or even limited in number. There is an urgent need for the increased provision of these tools, especially in Nigeria, where the researcher observed significant problem among junior academics who could not afford to purchase their own ICTs and had to rely on the few provided in the offices and libraries.

It is recommended that universities ensure access to ICTs that are needed to facilitate sharing and routine academic activities by providing these tools free to the academics, or at-least at subsidised rates, coupled with the provision of viable Internet and electronic library services. None of these would work without steady power supply to facilitate full function of these facilities. Implementing these ICTs would greatly facilitate and transform the level of participation and engagement in sharing activities.

Objective 5: To investigate the effects of information and knowledge sharing

The study revealed that information and knowledge sharing affects the academics in selected universities in both countries in their teaching, research, self-development and community service. Therefore, it is necessary to encourage and establish informal and

formal ties between the academics to facilitate the continuous sharing and exchange of ideas. This would ensure greater scrutiny of their research performance to refine and accommodate new ideas and innovations for efficiency in tune with the global standards. Academic institutions, as agencies for research and innovation, are expected to develop common grounds for improved living standards in society. The common grounds established should guarantee their growth individually and collectively in the areas of teaching and research, and the advantages should extend to their immediate communities for developmental initiatives, implementation and subsequent benefit to the larger society.

To surmise, the academics in the selected universities in these countries and Africa at large should establish collaborative ties to enhance productivity and growth in research output to contribute towards individual and societal development.

Objective 6: To examine the challenges to effective information and knowledge sharing

A number of challenges to information and knowledge sharing were identified in the current study, most notably by the Nigerian academics. These challenges are connected to the poor performance in global measures of research output and collaboration by academics in Africa in general and the countries under study in particular.

The range of problems affecting the sharing of information and knowledge, such as poor research management, poor communication, inadequate information resources, and poor attendance during academic gatherings should be studied in global context and not only as they affect the Nigerian system or nations on the African continent. There is urgent need for collaborative initiatives and projects to be organised multilaterally in Africa to mark out modalities towards improving the standard of universities and research institutions through the provision of world class facilities and funding for research activities. This also has to be based on the establishment of a comprehensive management policy that reflect global standards. The problems of information and knowledge sharing on the African continent have to be tackled collectively, especially by the leadership of the most productive nations, as African academics interact with others in their countries and beyond in the quest to share information and knowledge and their

overall practices. Some common ground has to be established for growth that is supplemented and supported by identifiable national and regional agencies towards achieving the broader objective of information and knowledge sharing.

Objective 7: To proffer solutions towards effective information and knowledge sharing

The academics involved in the current study shared their opinions concerning the common solutions to the problems of information and knowledge sharing. Among these solutions are the provision of required information resources, which would mean equipping the libraries with state of the art information management facilities and the provision of a functional research management policy that will ensure free and unrestricted access to the necessary support and incentives for the conduct of research and timely dissemination of results. Other recommended areas are to establish comprehensive institutional repositories and subscribe to relevant data bases for the provision of the necessary inputs for the conduct of research. The provision of scholarship and bursaries by the government and other agencies for the support of research activities, especially collaborative efforts, will go a long way towards achieving greater heights in African research output. These scholarships and bursaries will serve to motivate researchers and improve their ability to attend, participate, and disseminate their results during formal academic gatherings.

Objective 8: To analyse the research collaboration trends in the two countries

The term ‘research collaboration trend’, as it was used in this study, refers to the aggregate of activities by academics which include publications both single- and co-authored within and outside their universities and countries and across fields towards improving their research output. The current study examined the collaborative research trends among academics in the study areas from different angles using co-authorship as measure.

The study revealed the collaborative research trends among the academics in selected universities in Nigeria and South Africa and the study areas within their immediate environment. Universities need to encourage and ensure the participation of all academics in collaborative research, especially within their universities, and this must also extend to regional, continental and global collaboration. It is also strongly

recommended that the Nigerian universities must improve and transform their patterns of publication, especially their journals, to improve their online visibility. The researcher observed that in Nigerian universities majority of the journal publications and other research outputs are not visible online. This definitely undermines their impact worldwide, as increased visibility would lead to subsequent improvement in African and global standings.

8.5 Recommendations for further study

The current study involved and compared only a few selected universities in two African countries. Hence there is a need to cast the net wider and include more universities and countries in Africa and compare them to other developing and developed countries in order to offer a useful strategic framework for the attainment of contemporary and global research and collaborative standards within universities, countries, and Africa at large.

It is also suggested that research should be embarked upon by governments in Africa, private research institutions to streamline a multilateral perspective for African collaborative research initiative. This will give a clear cut explanation about the problems affecting knowledge sharing and collaboration in African universities.

Reference

Abalaka, Godwin (1991). Information needs and seeking behaviour of Natural scientist of Ahmadu Bello University, Zaria. Unpublished M.L.S Thesis: Ahmadu Bello University, Zaria. P.3

Abdelaziz, Abid (2004). Information Literacy for lifelong learning. A paper presented at world library and information congress: 70th IFLA General Conference and Council held in Buenos Aires, Argentina between 22 – 27 August 2004.

Abdel-Rahman, H. H., & Ayman, B. N. (2011). Jordanian student"s attitudes and perceptions towards knowledge sharing in institutions of higher education. *International Journal of Academic Research*, 3(4), 401-405.

Abell, A. and Oxbrow, N. (2001). Competing with knowledge: the information professional in the knowledge management age. London: Library Association.

Aboyade, B. O. (1982). The making of an informed society. Ibadan: University Press.

Abrami, P. C. and Barret, H. (2005). Directions for research and development on electronic portfolios. *Canadian Journal of Learning and Technology, 31(3).* [online] Available at: http://www.cjlt.ca/index.php/cjlt/article/viewArticle/92/86 [Accessed 20 july 2013]

Adler, P.S. and Kwon, SW. (2002). Social Capital: Prospects for a New Concept. *The Academy of Management Review,* 27(1), 17-40.

Adomi, E. E., Ogbomo, M. O. & Inoni, O. E. (2003), "Gender factor in crop farmers' access to agricultural information in rural areas of Delta State, Nigeria". *Library Review,* Vol. 52 No. 8, pp. 388-393.

Afiouni, F. (2004), Human resource management and knowledge management: A road map toward improving organizational performance, *Journal of American Academy of Business,* Vol. 11, pp. 124-131.

Afolabi M. (1993) Introduction to Research method for writing project and thesis, Zaria, Alpha publishers

Aguolu, C. C. & Aguolu I. E. (2000) *Libraries and information management in Nigeria,* Maiduguri Ed. Linform Service

Aguolu, C. C. (1984). The future of Education for Librarianship in Nigeria: Problems and expectations *Libri* 35 (3).

Aguolu, C. C. (2002). Libraries and information management in Nigeria, Maiduguri Ed. Inform Service.

Ajegbomogun, F. O. (2007). Impediments to harnessing scholarly electronic journals on the internet in developing countries: A Nigerian university case study. *Library Hi Tech News, 6, 27-32*

Alavi, M. and Leider, D. (2001). Review: knowledge management and knowledge management systems: conceptual foundations and research issues. *MIS Quarterly*, 25 (1), 107-136.

Aliyu, M. (2007) Information and communication network among natural scientist in Amadu Bello university, Zaria. *Samaru journal of information studies.* Vol. 7 (1) pp. 13

Allen, T. J. (1997). Managing the flow of technology: Technology transfer and the dissemination of technical information within the R&D organization. Cambridge, MA: MIT Press.

Allen, V. (1997). The knowledge evolution: expanding organizational intelligence. Boston: Butterworth-Heinemann.

Alter, C. & Hage, J. (1993) *Organizations Working Together*. London, Sage Publications.

Amabile, T. M., Patterson, C., Mueller, J., Wojcik, T., Odomirok, P. W., Marsh, M. & Kramer, S. J. (2001) Academic-Practitioner Collaboration in Management Research: A Case of Cross-Profession Collaboration. *The Academy of Management Journal,* 44(2), 418-431.

Ameen, K. & Haider, S.J. (2007). Evolving paradigm and challenges of collection management in university libraries of Pakistan, Collection Building, Vol.26, (2): 54-58.

American Library Association. (2003). Academic librarianship and the redefining scholarship project. [Online] Available at: http://www.ala.org/.../White_Papers_and_Reports/Academic_Librarianship_and_the_Redefining_Scholarship_Project.htm [accessed 12 February, 2013].

Andrews, K.M. and Delahay, B.L. (2000), "Influences on knowledge processes in organizational learning: the psychosocial filter", *Journal of Management Studies,* Vol. 37, pp. 797-810.

Argyris, C. & Schön, D. A. (1996) *Organizational Learning II: Theory, Method and Practice*. Reading, Addison-Wesley.

Asthana, S., Richardson, S. & Halliday, J. (2002) Partnership Working in Public Policy Provision: A Framework for Evaluation. *Social Policy & Administration,* 36(7), 780-795.

Bailey, K.D. (2008). Methods of social research. New York: Macmillan.

Balintulo, M. (2004). The role of the state in the transformation of South African higher education (1994-2002): Equity and redress revisited. In Zeleza, P.T. & Olukoshi, A. (eds.). African universities in the 21st century. Dakar: Council for the Development of Social Science Research in Africa. p 441-458.

Ball, R. (2011). The scholarly communication of the future: From book information to problem solving. *Publishing Research Quarterly*, 27, 1-12.

Banjo, A. (2000). In the saddle: A Vice Chancellor's Story. In: Y Lebeau & M Ogunsanya (eds). The Dilemma of Post-Colonial Universities. Ibadan: IFRA/African Book Builders.

Banjo, A. O. (1984). Indexes and Indexing, In: Indexing and indexes: Nigerian Perspective. Being selected papers from a seminar on indexing services

Organized by the Cataloguing and Classification Section, *Nigerian Library Association,* (23-25)

Bankole, O. M. (2013). The use of Internet services and resources by scientist at Olabisi Onabanjo University, Ago Iwoye, Nigeria. *Electronic Library and Information Systems*, 47, 15-33.

Barjak, F. (2006). The role of Internet in informal scholarly communication. *Journal of the American society for information and technology*, 57, 1350-1367.

Barquin, R. (2000). From bits and bytes to knowledge management. [Online[Available at: http://www.barquin.com [accessed 15 February, 2013).

Beller, S. (2001). The DIKUW model, National Health Data Systems. [Online[Available at: http://www.nhds.com/toc/htm [accessed 15 March, 2013).

Bellinger, G., D. Castro and Mills, A. (1997). Data, information, knowledge and wisdom. [Online] Available at: http://www.outsights.com/systems.dikw/dikw.htm [accessed 15 March, 2013).

Benjamin, S. A. (2001). Perspective on University autonomy and the sustainability of higher education in Nigeria. *Proceedings of the 12th General Assembly of the Social Science Academy of Nigeria,* 21-28.

Benson, J. K. (1975) The Inter-organizational Network as a Political Economy. *Administrative Science Quarterly*, 20(2), 229-249.

Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities, (2003), [Online] Available at: http://oa.mpg.de/lang/en-uk/berlin-prozess/berliner-erklarung/ [Assessed 15 June, 2014]

Blau, P. (1964) Exchange and Power in Social Life Wiley, New York.

Blignaut, S., Els, C. and Howie, S. (2010). Contextualizing South Africa's participation in the SITES 2006 module. *South African Journal of Education* 30: 555-570

Bontis, N. and Fitz-ens, J. (2002) "Intellectual capital ROI", a casual map of human capital antecedents and consequents www.bontis.com/ic/publictaions/IJTMCh

Bouthillier, F. & Shearer, K. (2002). Understanding knowledge management and information management: the need for an empirical perspective. *Information Research,* 8(1). [Online] Available at: http://informationr.net/ir/8-1paper141.html. [Accessed 15 October 2014]

Bouty, I. (2000). Interpersonal and interaction influences on informal resource exchanges between R&D researchers across organizational boundaries. *Academy of Management Journal* 43(1) 50-65.

Boydell, L. R. & Rugkåsa, J. (2007) Benefits of working in partnership: A model. *Critical Public Health*, 17(3), 217-228.

Britz, J.J. (2007), “Critical analysis of information poverty from a social justice perspective”, DPhil thesis, Department of Information Science, University of Pretoria, Pretoria.

Britz J. Johannes and Ponelis Shana, (2012),"Social justice and the international flow of knowledge with specific reference to African scholars", *Aslib Proceedings,* Vol. 64 Iss.: 5 pp. 462 – 477

Brown, T.T., R.M. Scheffler, S. Seo and M. Reed (2006), “The Empirical Relationship between Community Social Capital and the Demand for Cigarettes”, *Health Economics*, Vol. 15, No. 11, pp. 1159-1172.

Bryson, J. (1990). Effective Library and Information Centre Management Great Britain: Billing and Sons Ltd. Pp.256-257.

Buckland, M.K. (1991). Information as a thing. *Journal of the American Society for Information Science,* 42(5): 351-360.

Byerly, Greg and Brodie, Carolyn S. (1999). Information Literacy skills models: Defining the choices in learning library and information; principle and practice. Barbara stripling Eaglewood Littleton: *Libraries unlimited* 54 – 82.

Cabrera, A. and Cabrera E. (2002). Knowledge-sharing dilemmas: *Organizational Studies,* Vol. 23, pp. 687-710.

Cabrera, A., Collins, W.C., and Salgado, J.F. (2006). "Determinants of individual engagement in knowledge sharing", *The International Journal of Human Resource Management* 17(2) pp. 245-264.

Cambridge Dictionary (2003). Cambridge: Cambridge University Press.

Carnegie Corporation of New York. (n.d.). Higher Education and Libraries in Africa. [Online] Available at: http://carnegie.org/programs/higher-education-and-libraries-in-africa/ [Accessed 21 March, 2013]

Center for Research on Education, Diversity & Excellence (2002). Glossary. [Online] Available at: http://crede.berkeley.edu/tools/glossary.html [Accessed March 28, 2014]

Chalupnicek, P. (2010). The Capital in Social: An Austrian Perspective. *The American Journal of Economics and Sociology*, 69(4), 1230-1250.

Chambers, R. (2005) Ideas for Development, London, Routledge

Charles, C. A., Hayman, R., Mdee, A., (2012). Academic-NGO Collaboration in International Development Research: A reflection on the issues. [Online] Available at: http://www.intrac.org/pages/en/cracking-collaboration-anew-look-at-partnerships-in-international-development-research-.html [Accessed 12 may, 2014]

CHE. (2010). Universities of Technology – Deepening the Debate. February 2010

Chiu, C.M., Hsu, M.H., and Wang, E.T.G. (2006) "Understanding Knowledge Sharing in Virtual Communities: An Integration of Social Capital and Social Cognitive Theories," *Decision Support Systems* 42(3), pp. 1872-1888.

Chow, W. S., & Chan, L. S. (2008). Social network, social trust and shared goals in organizational knowledge sharing. *Information & Management,* 45(7), 458-465.

Clarke A. & Edwards, L. (1980). The Williams committee of inquiry into education and training in Australia: Recommendations for Universities. Higher Education, 9.

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*. 35(1), 128-152.

Commonwealth of Australia. (2004). Review of closer collaboration between universities and major publicly funded research agencies. [online] Available at: http://www.dest.gov.au/Collaboration/documents/pub.bdf [Accessed 30 March, 2014]

Condie, R. and Livingston, K. (2007). Blending online learning with traditional approaches: Changing practices. *British Journal of Educational Technology* 38 (2): 337-348

Core Group (2008). *CORE GROUP Members Discuss NGO Roles in Global Health Research*, A Summary Statement by the CORE Secretariat following CORE Group's Annual Spring Membership Meeting on April 14-18, 2008, CORE GROUP, Atlanta, Georgia.

Crane, D. (1972). Invisible College: diffusion of knowledge in scientific communities. Chicago, University of Chicago Press.

Creswell, I. W. (1994). Research Design: Qualitative and Quantitative Approaches. Thousand Oaks: Sage Publications

Cruikshank, Jane (2008). "Lifelong Learning and the New Economy: Limitations of a Market Model." *International Journal of Lifelong Education* 27/1: 51-69.

Curry, Stephen, (2012). "The inexorable rise of open access scientific publishing", guardian.co.uk [Online] Available at: http://www.guardian.co.uk/science/occams-corner/2012/oct/22/inexorable-rise-open-access-scientific-publishing [Accessed 14 June, 2014]

Curtis, G. (1999). Business information systems: Analysis, design, and practice (3rd Ed.). Addison Wesley.

Davenport, T.H., and Prusak, L. (1998). Working knowledge: how organisations manage what they know Harvard Business School Press, Boston, MA.

Davis, F. & Venkatesh, V. (1996). A critical assessment of potential measurement biases in the technology acceptance model: three experiments. *International Journal Human-Computer Studies, 45(1), 19-45*

Davis, F. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quaterly, 13 (3), 319-40*

De Sanctis, Gerardine and M. Scott Poole. (1994). Capturing the Complexity in Advanced Technology Use: Adaptive Structuration Theory, *Organization Science*, 5(2), 121-147.

Dee, T.S. (2004), "Are There Civic Returns to Education?" *Journal of Public Economics*, Vol. 88, pp. 1697-1720.

Denny, A. S & Tewksbury, R. (2012). How to write a literature review. *Journal of Criminal Justice Education,* 1-17

Department of Education (DoE). (1997). Education White Paper 3: A programme for the transformation of higher education. Pretoria: Government Printers.

Department of Education, (NCHE). Discussion Document, Pretoria, 1996.

Desjardins, Richard (2003). "Determinants of Economic and Social Outcomes from a Life-Wide Learning Perspective in Canada." Education Economics 11/1: 11-38.

Dipeolu, S. (1992). Survival strategies for University libraries in the 21st century, In: Salisu, T. M., & Olanlokun, S.O. (eds.) Committee of University Librarians of Nigerian Universities. *Proceedings of the Ibadan Ekpoma seminars 1992 and 1994*.

Donate, M., and Guadamillas, F. (2011). Organizational factors to support knowledge.

Doyle, L. O. (1975). *Information Retrieval and Process:* Los Angeles; Melville Publishing Company.

Draca, M., Sadun, R. and Van Reenen, J. (2006). *Productivity and ICT: A review of evidence*. CEP Discussion Paper No. 749. London: Centre for Economic Performance, School of Economics and Political Sciences.

Du Plooy, G. M. (2009). *Communication research: techniques, methods and applications.* Cape Town: Juta & Company.

Duke, Chris, Mike Osborne and Bruce Wilson, eds. (2005). Rebalancing the Social and Economic: Learning, Partnership and Place. Leicester, U.K.: National Institute of Adult Continuing Education (NIACE).

Edmonds, M. & kennedy, T. D. (2013). *An applied reference guide to research design: Quantitative, qualitative and mixed methods*, Los Angeles. Sage Publications Inc.

Eisenhart, M. A. (1991). Conceptual frameworks for research circa: ideas from a cultural anthropologist; implications for mathematics education researchers. *Proceedings of the 13th annual meeting of the North American chapter of the International Group for the Psychology of Mathematics Education,* 1, 202-219

Elliott, J. (2005). Merging right: questions of access and merit in South African higher education reform, 1994-2002. *Perspectives in Education,* 23(1), 69-76.

Emerson, R. M. (1962). Power-Dependence Relations. *American Sociological Review,* 27(1), 31-41.

Erdelez, S. (1997). Information encountering: a conceptual framework for accidental information discovery. In: P. Vakkari, R. Savolainen, and B. Dervin, eds. Information seeking in context: proceedings of an international conference on research in information needs, seeking and use indifferent contexts, 14-16 August, Tampere, Finland. London: Taylor Graham, 412-421.

Etim, E. F. (2001). Scientific and technological information use and industrial Development in Nigeria. Uyo: Heinemann.

European Commission: Expert Group on Assessment of University-based Research. (2010). *Assessing Europe's University-based Research* [Online]. Available at: http://ec.europa.eu/research/science-society/document_library/pdf_06/assessing-europe-university-based-research_en.pdf [Accessed 26 January, 2015].

Falk, Ian (2001). "Literacy by Design, Not by Default: Social Capital's Role in Literacy Learning." *Journal of Research in Reading* 24/3: 313-23.

Fari S. A. (2010). Application of ICTs in Information Sharing Among Academics in Nigeria: *UMYU Journal of Educational Research,* vol. 2(1), 185-190

Fari S. A. (2011). Pattern of Information Sharing Among Academics in Tertiary Institutions in Katsina State: *A.B.U. Journal of Educational Research and Development,* Vol. 6(1), 210-218.

Federal Republic of Nigeria, (2004). National Policy on Education (Revised). Yaba, Lagos: NERDC press.

Ferdinand, A. E. (1994) Foundation of library and use and system services. Onitsha: Noble Publishers.

Fernandez, R. M., Castilla, E. J., & Moore, P. (2000). Social capital at work: Networks and employment at a phone centre. *American Journal of Sociology*, 105(5), 1288-1356.

Fisher, S. (2011) Knock, knock, knocking on closed doors: exploring the diffuse ideal of the collaborative research relationship. *Area*, 43(4), 456-462.

Friend, J. K., Power, J. M. & Yewlett, C. J. L. (2003) *Public Planning: The Inter-Corporate Dimension*. London, Routledge.

Froehlich, J. (1997). Survey and analysis of the major ethical and legal issues facing Library and Information Services. Muchen: K.G Sauro

Fukuyama, F. (2002). Social Capital and Development: The Coming Agenda. *Johns Hopkins University Press,* 22(1), 22.

Gaffoor, S. & Cloete, F. (2010). Knowledge management in local government: the case of Stellenbosch Municipality. South African Journal of Information Management, 12 (1). [Online] Available at: http://www.sajim.co.za. [Accessed 15 October, 2014]

Gamble, Teri Kwal (2002). Communication Works. New York. McGraw-Hill Companies.

Gandhi, S. (2004). Knowledge management and reference services. *The Journal of Academic Librarianship,* 30(5):368–381.

Gannon-Leary, P., Bent, M. and Webb, J., (2008). A Destination or a Place of Last Resort. *Library and Information Research*, 32, 3-14.

Garip, F. (2008). Social Capital and Migration: How Do Similar Resources Lead to Divergent Outcomes? *Demography,* 45(3), 591-617.

Ghatak, S. (2007), "Brief note on ICTs", [Online] available at: http://topics.developmentgateway.org/poverty/rc/filedownload.do~itemId=1098665 [accessed 24 October 2014].

Gill, D. (2008). Strategic disclosure of intermediate research results. *Journal of Economics & Management Strategy* 17(3) 733-758.

Godowin, M. & Quisumbing, A. R. (2008), Separate but Equal? The Gendered Nature of Social Capital in Rural Philippine Communities. *Journal of International Development,* 20(1), 13-52.

Goh, S. C. (2002). Managing effective knowledge transfer: an integrative framework and some practice implication. *Journal of Knowledge Management*, 6 (1), 23-30.

Govinder K. S., Zondo, N. P. and Makgoba, M. W. (2013). A new look at demographic transformation for universities in South Africa. *South Africa Journal of Science,* 109(11/12), http://dx.doi.org/10.1590/sajs.2013/20130163

Gray, J. and Perry, B. (1975). Scientific Information; London: Oxford University Press. Pp. 1-3.

Griffiths, P. (1999). Knowledge and information management in the public sector. London: Ark Group Limited in association with Inside Knowledge.

Grootaert, Christiaan (1998). "Social Capital: The Missing Link?" Social Capital Initiative Working Paper No. 3. Washington, DC: The World Bank. [Online] Available at: http://siteresources.worldbank.org/INTSOCIALCAPITAL/Resources/Social-Capital-Initiative-Working-Paper-Series/SCI-WPS-03.pdf [Accessed 03 November. 2014]

Gurteen, D. (1999). Creating a knowledge sharing culture. Knowledge Management Magazine, 2(5). [Online] Available at: http://www.gurteen.com/gurteen/gurtee.nsf/id/ksculture. [Accessed 15 October 2014].

Haas, M. R. (2006). Different knowledge, efferent benefits: toward a productivity perspective on knowledge sharing in organizations [Electronic Version]. [Online] Available at: http://knowledge.wharton.upenn.edu/papers/1346.pdf. [Accessed 20 October 2014] Hague: Martinus Nijhoff Publishers.

Haines, L. L., Light, J., O'malley, D. & Delwiche, F. A. (2010). Information-seeking behaviour of basic science researchers: implication for library services. *Journal of the Medical Library Association*, 89, 73-81.

Hall, H. (2006). Exploring Knowledge Sharing in Distributed Organizations, *Report on Research in Progress*. [Online] Available at: www.dcs.napier.ac.uk [Accessed 20 February, 2012]

Halpern, David (2005). Social Capital. Cambridge: Polity Press.

Hanley, T. & Vogel, I. (2012) *Effective Academic-Humanitarian Collaboration*, A practical resource to support academic and humanitarian organisations working together, Enhanced Learning & Research for Humanitarian Assistance (ELRHA), London.

Hanna, et al (1995). The diffusion of information and communication technology: experience of industrial countries and a lesson for developing countries, World Bank Discussion Papers 281, Washington, P. 7.

Hannah, R. L. (1998). Merging the intellectual and technical infrastructures in higher education: The Internet example. The Internet and Higher Education.

Harle, J. (2010). *Growing knowledge: Access to research in east and southern African universities* [Online]. Available at: http://www.arcdiafund.org.uk/sites/default/files/arc_pub_africanconnectivity_theassociationofcommonwealthunis_0.pdf [Accessed 04 January, 2015]

Harle, J., (2009). The Nairobi Report: Frameworks for Africa-UK Research Collaboration in the Social Sciences and Humanities: African University Perspectives.

Harle, J., (2011). The Nairobi Process: Foundations for the Future, Supporting the Early Careers of African Researchers. The Association of Commonwealth Universities,

London, UK. [Online] Available at: http://www.acu.ac.uk/view_news?id=131 [Accessed 20 February, 2012]

Hartinah, S., Davis, M., Hydari, A., & Kent, P. (2001). Indonesian nutrition research papers 1979-98: A bibliometric analysis. In: M. Davis & C. S. Wilson (eds.). *Proceedings of the 8th International Conference on Scientometrics and Informetrics,* Sydney, July, 16-20, 1, 177-225.

Hasse-Biber, S. N. (2010). Mixed Method Research: Merging Theory with Practice. New York, the Guildford Press, Pp. 11&14

Heller, M.A., R.S. Eisenberg (1998). Can patents deter innovation? The anti-commons in biomedical research. *Science 280* 698-701.

Hendriks, P. (1999). Why share knowledge? The influence of ICT on the motivation for knowledge sharing. *Knowledge & Process Management*. 6(2), 91-100.

Higher Education Act, no 101. (1997). *Government Gazette* (18515)

Himmelman, A. T. (1996) On the Theory and Practice of Transformational Collaboration: From Social Service to Social Justice IN HUXHAM, C. (Ed.) *Creating Collaborative Advantage*. London, SAGE.

Holt, G.E. (2007). Theft by library staff: The bottom line: *managing library finances,* Vol.20 (2): 85-92.

Hsu, C.L., and Lin, J.C. (2008) "Acceptance of blog usage: The roles of technology acceptance, social influence and knowledge sharing motivation" *Information & Management* 45(1), pp. 65-74.

Hsu, M.H., Ju, T.L., Yen, C.H., and Chang, C.M. (2007) "Knowledge Sharing Behavior in Virtual Communities: The Relationship between Trust, Self-Efficacy, and Outcome Expectations," *International Journal of Human-Computer Studies* 65(2), pp. 153-169.

Hughes, S. K. and Shapiro J. J. (1996) “Information literacy as liberal Art. Enlightenment proposal for a new curriculum”. *Education review* 3(2).

Huxham, C. (1996) *Creating Collaborative Advantage*. London, SAGE.

Ifidon, S.E. (1995). Management of information institutions in a depressed economy. *Nigerian Libraries* 29(1&2). pp. 28- 41.

Ikoja-Odongo, J.R. (2001) A study of information needs and uses in the informal sector in Uganda: preliminary findings. LIBRES: *Library and Information Science Research Electronic Journal,* 11(1) Retrieved 24th February. 2013 from http://libres.antin.edu.aullibres.

International Institute for Educational Planning (January-March, 2007). Higher education and development. Newsletter, XXV (1), p.4. http://www.iiep.unesco.org/fileadmin/user_upload/pdf/jane07.pdf Retrieved: 20 October 2014

Jansen, J.D. (2004). How mergers shape the institutional curriculum. South African *Journal of Higher Education,* 18(1), 5-18.

Janus-Hiekkarranta, A. (2009). Developing a comprehensive knowledge management approach for ICT-based professional services companies: a case study. Masters Thesis, Technology management and Policy. Department of Business Technology. Helinski School of Economics. http://hsepubl.lib.hse.fi/FI/ethesis/pdf/12198/hse_ethesis_12198.pdf. Accessed 15 October 2014.

Jarvenpaa, S.L. & Staples, D.S. (2001), Exploring perceptions of organizational ownership of information and expertise. *Journal of Management Information Systems,* 18(1):151–183.

Jashapara, A. (2005). The emerging discourse of knowledge management: a new dawn for information science research? *Journal of Information Science,* 31(2):136–148.

Jiyane, Glenrose V.;Majanja Mabel K.; Mostert Bertha J. and Ocholla Dennis.(2013). South Africa as an information and knowledge society: the benefit to informal sector women entrepreneurs. *South African Journal of Libraries and Information Science* Vol 79(1):1-115. Retrieved 16 December, 2014, from http://sajlis.journals.ac.za.doi:10.7553/79-1-115

Johnson, A. M. (2011). *Charting a course for a successful research career: A guide for early career researchers* [Online]. Available: http://cdn.elsevier.com/assets/pdf_file/0019/111835/charting-a-course-for-a-successful-research-career.pdf [Accessed 12 December 2014].

Johnson, H. & Wilson, G. (2006) North–South/South–North partnerships: closing the 'mutuality gap'. *Public Administration and Development*, 26(1), 71-80.

Jones, K.S. (2006), "Giving and Volunteering as Distinct Forms of Civic Engagement: The Role of Community Integration and Personal Resources in Formal Helping", *Non-profit and Voluntary Sector Quarterly,* Vol. 35, No. 2, pp. 249-266.

Jones, M., Cline, M., & Ryan, S. (2006). Exploring knowledge sharing in ERP implementation: An organizational culture framework. *Decision Support Systems,* 41(2), 411–434.

Jones, T., & Taylor, S. F. (2012). Service loyalty: accounting for social capital. *Journal of Services Marketing,* 26(1), 60-75

Jung, T., Harrow, J. & Pharoah, C. (2012) *Co-producing Research: Working Together or Falling Apart?*, CGAP Briefing Note 8; January 2012, CASS Business School, London.

Kaniki, A. M., (2003). Information Needs for Basic Research: an African Perspective.

Kaniki, A. M., (2007). The South African Research Environment and the National Research Foundation. Presented at the Library Academy of the Research Libraries Consortium Funded by the Carnegie Corporation of New York, Mont Fleur, Stellenbosch, 16 – 22 September 2007.

Kankanhalli, A., Tan, B. C. Y., and Wei, K. K. (2005). Contributing Knowledge to Electronic Knowledge Repositories: An Empirical Investigation, *MIS Quarterly*, 29(1),113-143.

Katz, J. S. & Hicks, D. 1997. How much is collaboration worth? A calibrated bibliometric model. *Proceedings of the Sixth Conference of the International Society for Scientometrics and Informetrics,* Jerusalem, Israel, June 16-19, p. 163-175.

Katz, J. S. & Martin, B. R. (1997). What is research collaboration? *Research policy,* 26(1), 1-18

Kerka, Sandra (2000). “Lifelong Learning. Myths and Realities No. 9.” United States Department of Education, Office of Education, Research and Improvement. Retrieved 3 October 2014: http://www.eric.ed.gov:80/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/16/36/80.pdf

Key Perspectives Ltd., (2009). A Comparative Review of Research Assignment Regimes in Five Countries and the Role of Libraries in the Research Assessment Process. Report commissioned by OCLC Research. Retrieved 28 February 2014 from: http://www.oclc.org/research/publications/library/2009/2009-09.pdf

Khan, R.E. (2010). Developing the Theoretical and Social Framework. Lecture J199. [Online] Available at: http://www.scribd.com/patrisya123/documents. (Accessed on 20 December 2013)

Kim, S. and Lee, H. (2006). The impact of organizational context and information technology on employee knowledge-sharing capabilities. *Social Science Journal*, 66 (3), 370-385.

King, W. R. & He, J. (2006). A meta-analysis of the technology acceptance model, *Information and Management.* 43 (6), 740-755

King, W.R., and Marks Jr., P.V. (2008). "Motivating knowledge sharing through a knowledge management system," *Omega* 36(1), pp. 131-146.

Klijn, E. H. & Teisman, G. R. (2000) Governing Public-Private Partnerships: Analysing and Managing the Process and Institutional Characteristics of Public-Private Partnerships IN OSBORNE, S. P. (Ed.) *Public-Private Partnerships*: Theory and Practice in International Perspective. London, Routledge.

Kothari, C.R. (1985). Research methodology: methods and techniques. New Delhi Wiley Eastern.

Kroes, Neelie, (2012). “Scientific data: open access to research results will boost Europe's innovation capacity”, Europa.eu, http://europa.eu/rapid/press-release_IP-12-790_en.htm?locale=en

Kumar, R., Novak, J., Raghavan, P., & Tomkins, A. (2004). Structure and evolution of blogspace. *Communications of the ACM,* 47, 35-39.

Larson, A. (1992) "Network Dyads in Entrepreneurial Settings: A Study of the Governance of Exchange Relationships," *Organization Science* 37(1), pp. 76-104.

Lasker, R. D. & Weiss, E. S. (2003) CREATING PARTNERSHIP SYNERGY: THE CRITICAL ROLE OF COMMUNITY STAKEHOLDERS. *Journal of Health and Human Services Administration,* 26(1), 119-139.

Lave J. and Wenger, E. (1991). Situated learning: legitimate peripheral participation. New York: Cambridge University Press.

Le Grange, L. (2011). (Re)thinking (trans)formation in South African (higher) education. *Perspectives in Education,* 29(2), 1-9.

Lee, D.J., and Ahn, J.H. (2007). “Reward systems for intra-organizational knowledge sharing”, European Journal of Operational Research, Vol. 180, pp. 938–956. Management and Innovation”, *Journal of Knowledge Management,* Vol. 15, No. 6, pp. 890-914.

Lee, Y., Kozer, K. A. & Larsen K.R.T. (2003). The technology acceptance model: past, present and future. *Communications of the AIS, 12(50), 752-80*

Leedy, P. D. (1997). Practical Research. Planning and Designing. 6thed. Upper Saddle River: Merrill, p.55

Leedy, P. D. and Ormrod, J. E. (2005). Practical Research: Planning and Design. 8th.ed Ohio: Pearson Prentice Hall. P.45

Levy, Y. & Ellis, T. J. (2006). A system approach to conduct an effective literature review in support of information systems research. *Information Science Journal,* (9), 181-212.

Liang T. P., Liu C.C. & Wu C. H. (2008). Can social exchange theory explain individual knowledge sharing behavior? A meta-analysis. Retrieved from http://www.whiceb.com/download/whiceb2008/seminar/Ting-Peng%20Liang.pdf

Lin, H.F. (2007). “Effects of extrinsic and intrinsic motivation on employee knowledge sharing intentions,” *Journal of Information Science* 33(2), pp. 135-149.

Lin, N. (1999). Social networks and status attainment. *Annual Review of Sociology,* 25(1), 467-487.

Liu, S., Liao, H. & Pratt, J. (2009). Impact of media richness and flow on e-learning technology acceptance. *Computers & Education,* 52(3), 599-607. http://dx.doi.org/10.1016/j.compedu.2008.11.002

Lor, P.J. & Britz, J.J. (2007). Is a knowledge society possible without freedom of access to information? *Journal of information science*, 33(4): 387-397.

Lwoga, E. T. and Ngulube, P. (2008). “Managing indigenous and exogenous knowledge through information and communication technologies for agricultural development and achievement of the UN Millennium Development Goals”, in Njobvu, B. and Koopman, S. (Eds). *Libraries and information services towards the attainment of the UN Millennium Development Goals,* Walter de Gruyter, Berlin, pp. 73-88.

Ma, M., and Agarwal, R. (2007). "Through a Glass Darkly: Information Technology Design, Identity Verification, and Knowledge Contribution in Online Communities," *Information Systems Research* 18(1), pp. 42 - 67.

Ma, Q. & Liu, L. (2004). The technology acceptance model: a meta-analysis of empirical findings. *Jr. of Org., End User Computing, 16 (1), 59-72*

Mahapatra, A. (2010). Research in a brave new Web 2.0 World. *ACS Chemical Biology*, 5, 799-800.

Maidabino, A. A. & Zainab, A. N. (2011). Collection security management at university libraries: assessment of its implementation status. *Malaysian Journal of Library & Information Science*, Vol.16, no.1, April 2011:15-33

Maron, N. L. & Smith, K. K. (2008). Current models of digital scholarly communication: results of an investigation concluded by Ithaka for the Association of Research Libraries [Online]. Available: http://comminfo.rutgers.edu/tefko/Course/Zadar/Readings/Maron%20ARL%20dig%20sch%20comm%202008.pdf [Accessed 24 January 2015].

Marsland, N., Wilson, I. and Abeyasekera, S. (2000). A Methodological Framework for Combining Qualitative and Quantitative Survey Method .London. p.24

Martin, W.J. (1995). The information society. London: Aslib.

Mavodza, J., & Ngulube, P. (2012). Knowledge management practices at an institution of higher learning. *SA Journal of Information Management.* Retrieved March 14th, 2013, from http://www.sajim.co.za/index.php/SAJIM/article/view/496/584

Max Planck Institute for Psycholinguistics. (2013). Research output [Online]. Available: http://www.mpi.nl/departments/other-research/publications-and-presentations [Accessed 26 January 2015].

Maxwell, J. A. (2005). Qualitative Research Design: An Interactive Approach. *SAGE publications,* New Delhi p.22.

McDermott, R., & O'Dell, C. (2000). Overcoming cultural barriers to sharing knowledge. *Journal of Knowledge Management*, 5(1), 76-85.

Mdee, A., Akuni, J., Thorley, L. & Otieno, P. (2012) *"Now I Know My Rights"! Exploring Group Membership and Rights-Based Approaches for People Living With HIV/Aids in Northern Tanzania,* JEFCAS Working Paper No.4, University of Bradford, Bradford.

Meadows, A.J. (1998) Communicating research. San Diego: Academic Press

Mfusi, X.M. (2004). The effects of higher education mergers on the resultant curricula of the combined institutions. *South African Journal of Education,* 18(1), 98-110.

Milligan, K., E. Moretti and P. Oreopoulos (2004), “Does Education Improve Citizenship? Evidence from the United States and the United Kingdom”, *Journal of Public Economics,* Vol. 88, pp. 1667-1695.

Moed, H. F., (2010). Citation Analysis and Research Evaluation. Springer, Dordrecht, The Netherlands.

Mohammed, Z. (1998) Education and training for library and Information professionals in the new millennium in: *compendium of papers presented at the annual National Conference and Annual General Meeting of the Nigerian Library Association, Abuja.*

Mohammed, Z. (2006). Library and Information Science Research in Nigeria. Mimeograph. Pp. 3-10

Molm, L.D. (2001). Theories of social exchange and exchange networks G. Ritzer and B. Smart, *Sage*, London, pp. 260-272.

Morton, J., Quan, J., Nelson, V. & Albright, K. (2002) Improving Communication with U.K. Agricultural and Related Scientific Expertise. *Science Communication*, 23(4), 442-462.

Mouton, N., Louw, G.P. & Strydom, G.L. (2012). Restructuring and mergers of the South African post-apartheid tertiary system (1994-2011): A critical analysis. Article submitted to the International Business and Economic Research journal.

Mugenda, O. M. and Mugenda , A. G. (1999). Research Methods. Quantitative and Qualitative Approaches. Kenya: Acts Press, p.5-8

Mukherjee, A., S. Stern (2007). Disclosure or secrecy? The economics of open science. SSRN Working Paper.

Mulligan, A. & Mabe, M. (2011). The effect of the Internet on researcher motivations, behaviour and attitudes. *Journal of Documentation*, 67, 290-311.

Muriithi, P., Horner, D. & Pemberton, L. (2013). Understanding factors influencing the effect of scientific collaboration on productivity in a developing country: Kenya [Online]. Available:

http://www.asis.org/asist2013/proceedings/submissions/papers/70paper.pdf [Accessed 20 January 2015].

Musa, Abdullahi (2005). IT Systems in an Organization. Memeograph.

Nahapiet, J. and Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *The Academy of Management Review*, 23 (2), 242-266.

Nassimbeni, M. (1998). The information society in South Africa: from global origins to local vision. *South African journal of libraries and information science*, 66(4): 154-160.

National Education Policy Investigation (1993) Post-secondary Education Oxford/NECC, Cape Town.

National Universities Commission (2012). Implication of Remedying the Deficiencies Identified During the Comprehensive Accreditation Exercise. National Universities Commission, Abuja, Nigeria, pp. 19.

National Universities Commission (2012). List of Universities. Retrieved on 10/12/2012 from http://www.nuc.edu.ng/pages/universities.asp p.1-3

National University of Ireland. (n.d.). Measuring your Research Impact. Tutorial. Retrieved 20 March, 2013 from: http://www.ndlr.ie/myri/MyRI_Tutorial/player.html

Nelson, R. R. (2004). The Market Economy and the scientific commons. *Research Policy* (33) 455-471. New York, Halt Rinehart and Winston Inc.

Newman, M.E.J. (2000). The Structure of Scientific Collaboration Networks. In www.pnas.org. pp1-3

Ng, W. and Gunstone, R. (2003). Science and computer-based technologies: attitudes of secondary science teachers. *Research in Science and technological Education* 22 (2): 243-264.

Ngulube, P. 2005. Research procedures used by Master of Information Studies students at the University of Natal in the period 1982–2002 with special reference

to their sampling techniques and survey response rates: a methodological discourse. *The International Information and Library Review,* 37(2):127–143.

Nkpa, N. (1997). Educational research for modern scholars. Enugu: Fourth Dimension Publishing.

Nonaka, I. (1994). The knowledge-creating company. *Harvard business review,* 69(6):96-104.

Nonaka, I., & Takeuchi, H. (1995). The knowledge-creating company: How Japanese companies create the dynamics of innovation. Oxford, UK: Oxford University Press.

Nory B. Jones, (2007). Darylyne Provost, "Developing a University Research Web-Based Knowledge Portal".

O'Reilly, Tim (2005), 'What is Web 2.0?' in Teaching with Technology: An Academic Librarian's guide, Chandos Publishing, UK

O'Sullivan, E., Rassel, G.R. & Berner, M. 2008. Research methods for public administrators. New York: Pearson.

Ocholla D. N. and Le Roux J. (2011). Conceptions and misconceptions of theoretical frameworks in Library and Information Science Research. Available at: www.unisa.ac.za/contents/.../Mousaion%2029%20(2)content.pdf (Accessed 15 March, 2014)

Ocholla, D. N. (2003). Using informetrics for analyzing indigenous knowledge. A paper presented at the International Conference on Collaboration and Sharing of Knowledge. 30-31 July 2003, Senate hall, Theo van Wyk Building, Main Campus, Muckleneuk Ridge, UNISA, Pretoria.

Ocholla, D. N. (2007). Marginalized Knowledge: An Agenda for Indigenous Knowledge Development and Integration with Other Forms of Knowledge. *International Review of Information Ethics*, Vol.7, Pp. 1-10

Ocholla, D. N. (2011). an overview of Issues, Challenges and Opportunities of Scholarly Publishing in Information Studies in Africa. *African Journal of Libraries, Archives and Information Science,* Vol. 21(1), Pp. 1-16.

Okee, O. (2005) "Information explosion and the role of information resources management in the new millennium." *Proceeding of NLA*.

Olabisi, T. O., and Alabi, G. A. (1985). Provision, Accessibility and use of Scientific Literature in Nigerian Universities: In What Science? Edited by F.M.A. Ukoli P. 131

Oliar, D., Sprigman, C. (2008). The emergence of intellectual property norms in stand-up comedy. American Law & Economic Association Annual Mettings Paper 41.

Oliver, E.C., et al (2000). Data processing and ICT –An instructional manual for business and accountancy students (8th ed.). London: DP Publication.

Ologbonsaiye, R. (1994).Resource management for libraries. Lagos: Concept Publications.

O'Mahony, S. (2003). Guarding the commons: how community managed software projects protect their work. *Research Policy* (32) 1179-1198.

Ononogbo R. U. and Falaiye Z. M. (2002) New Standards for Library Education in Nigeria, *World Library* 2(2)

Onyancha, O.B. & Ocholla D.N. (2004). A comparative study of the literature on HIV/AIDS in Kenya and Uganda: A bibliometric study. *Library & Information Science Research*, 26(2004), 434-447

Opaleke, J. S. (2012). Influence of Librarians Leadership Styles on Job Specific, Task Proficiency, Demonstrating Efforts and Team Performance of Subordinates. *Nigerian Libraries Journal of the Nigerian Library Association, 45 (2), p. 105*

Orlikowski, W. and Robey, D. (1991). Information Technology and the Structuring of Organizations, *Information Systems Research*, 2(2),143-169.

Osareh, F. and Wilson, C. S. (2001). Iranian scientific publications: Collaboration, growth, and development from 1985-1999. In M. Davis & C. S. Wilson (eds).

Proceedings of the 8th International Conference on Scientometrics and Informetrics, Sydney, July, 16-20, 2, 499-509.

Osuala, E. C. (1993). Introduction to Research Methodology. Onitsha: Africana FEP Publishers Ltd. p. 180.

Palmer, J. (1991). Scientists and information, II: Personal factors III information behaviour. *Journal of Documentation,* 47(3):254-275.

Pantry, S. & Griffiths, P. (2003). Librarians or knowledge managers? What's in a name, or is there a real difference? *Business Information Review,* 20(2):102–109.

Park, N. (2009). User acceptance of e-learning in higher education: An application of Technology Acceptance Model. Paper presented at the Annual meeting of the International Communication Association, New York.

Pearlson, K. E., & Saunders, C. S. (2006). Managing & using information systems: A strategic approach. John Wiley & Sons.

Persson, O., Glazel, W., & Danell, R. (2003). Inflationary bibliometric values: The role of scientific collaboration and the need for relative indicators in evaluative studies. In: J. Guohua, R. Rousseau & W. Yishan. *Proceedings of the 9th International Conference on Scientometrics and Informetrics* – ISSI, 411-420

Pickard, A. J. (2007). *Research Methods in Information.* London: Facet Publishing.

Polanyi, M. (1961). "Knowing and being", *Mind,* Vol. 70 No. 280:458-70.

Polanyi, M. (1966). The tacit dimension. New York: Anchor Day Books.

Pouris, A., (2007). The International Performance of the South African Academic Institutions: A Citation Assessment. Higher Education: *the International Journal of Higher Education and Assessment,* 54, 501 – 509.

Procter, R., et al. (2010). Adoption and use of Web 2.0 in scholarly communications. *Philosophical Transactions of the Royal Society* A, 368, 4039-4056.

Putnam, Robert D. 2000. *Bowling Alone: The Collapse and Revival of American Community.* New York: Simon and Schuster.

Rajasekar, S., Philominathan, P. & Chinnathambi, V. (2006). Research methodology [Online]. Available: http://arxiv.org/pdf/physics/0601009.pdf [Accessed 27 January 2015].

Rao, M.K. & Raghavan, K.S. (2003). Collaboration in knowledge production: A case study of superconductivity research in India. In: J. Guohua, R. Rousseau & W. Yishan. *Proceedings of the 9th International Conference on Scientometrics and Informetrics – ISSI,* 230-240

Ratcliff, F.W. (1992).Changing times: Crime and security as a major issue in libraries. Aldershot: Gower. pp 1-11.

Ravi, L. (2008). Library futures – from information gateways to knowledge gateways. In: *Beyond the hype: web 2.0 symposium of the Australian Library and Information Association,* 1–2 February 2008, Brisbane, Australia.

Research Information Network. (2008). Ensuring a Bright Future for Research Libraries: A Guide for Vice-Chancellors and Senior Institutional Managers. Retrieved 17 December, 2013 from: http://www.rin.ac.uk/our-work/using-and-accessing-information-resources/ensuringbright-future-research-libraries

Reus, T., and Liu, Y. (2004). "Rhyme and reason: Emotional capability and the performance of knowledge-intensive work groups", *Human Performance,* Vol. 17, No. 2, pp. 245-266.

Rhoten, D., W. W. Powell (2007). The frontiers of intellectual property: Expanded protection vs. new models of open science. *Annual Review of Law and Social Science* 3 345-373.

Riege, A. (2005). Three-dozen knowledge sharing barriers managers must consider. *Journal of Knowledge Management*, 9(3):18-35.

Rioux, K. (2000) Sharing information found for others on the World Wide Web: a preliminary examination. *Proceedings of the 63rd Annual Meeting of the American Society for Information Science.* 68-77.

Ritter, T., Wilkinson, I. and Jonhston, W. (2004): Managing in complex business networks. *Industrial Marketing Management,* 33, 175-183.

Rochester, M., & Vakkari, P. (1998). International LIS research: A companson of national trends. *IFLA Journal* 24:166-175.

Roper, L. (2002) Achieving Successful Academic-Practitioner Research Collaborations. *Development in Practice*, 12(3/4), 338-345.

Roscoe, J. T. (1969) Fundamental Research Statistics for Behavioural – Sciences.

Rosenthal, E. (1997). Social networks and team performance. *Team Performance Management*, 3(4), 288-294.

Ruggles, R. (1998) "The state of the notion: knowledge management in practice," *California Management Review* 40(3), pp. 80-89.

Rusli Abdullah, Mohd Hasan Selamat, Shamsul Sahibudin, Rose Alinda Alias, (2007). "A Framework for Knowledge Management System Implementation in Collaborative Environment for Higher Learning Institution", *Journal of Knowledge Management Practice*

Salisbury, W. D., Chin, W. W., Gopal, A. and Newsted, P.R. (2002). Research report: better theory through measurement in developing a scale to capture consensus on appropriation, *Information System Research*, 13(1), 91-103.

Salmi, J., (2009). The Challenge of Establishing World-Class Universities. World Bank, Washington, DC. Retrieved 16 August, 2013 from: http://siteresources.worldbank.org/EDUCATION/Resources/278200-1099079877269/547664-1099079956815/547670-1237305262556/WCU_summary.pdf

Salter, B. (1983). Contract Research Universities and the knowledge market. Higher Education Review, 15.

Sam, E.I.(2005) "Information rules the world. In computerization of library operations in the information age" Proceeding of selected papers of the cataloguing,

classification and indexing section of the Nigeria Library Association. 2001 – 2002 section PP. 117 Dansalama Press Ltd.

Sambo, A. A. (2005). Research Methods in Education. Ibadan: Stirling – Horden publishers (Nig.) Ltd. P.55

Sample, Ian, (2012) "Free access to British scientific research within two years" The Guardian, http://www.guardian.co.uk/science/2012/jul/15/free-access-british-scientific-research

SASCO (1997) "Submission on the Green Paper on Higher Education transformation", 15 March, photocopy. Source: SASCO head office, Braamfontein, Jhb.

Saunders, M. Lewis, P. & Thornhill, A. (2012). Research Methods for Business Students, London, Pearson Education Limited.

Saunders, Ron (2006). "Skills and Knowledge for Canada's Future: Seven Perspectives towards an Integrated Approach to Human Capital Development." Report. Canadian Policy Research Networks. Retrieved 21 October 2014: http://www.cprn.org/documents/44360_en.pdf

Scheffler, R.M. and T.T. Brown (2008), "Social Capital Economics and Health: New Evidence", *Health Economics, Policy and Law,* Vol. 3, No. 4, pp. 321-331.

Schmiede, R. (2009). Upgrading academic scholarship: Challenges and chances of the digital age. *Library Hi Tech* 27, 624-633.

Schrader, S. (1991). Informal technology transfer between firms: Cooperation through information trading. *Research Policy* 20 153-170.

Scott, Peter (2001), 'Blogging: Creating Instant Content for the Web', [online], Available at: http://www.library.usask.ca/~scottp/il2001/definitions.html, [accessed 18 October 2014]

Seldon, L. (2001). Academic information seeking - careers and capital types. *New Review of Information Behaviour Research* 1(2), 195-215.

Singh, S.P. (2007). What are we managing – knowledge or information? VINE: *The Journal of Information and Knowledge Management Systems,* 37(2):169–179.

Skyrme, D. (2001). Knowledge management: approaches and policies. [Online]. Available from: www.skyrme.com/pubs/deeds_kmdoc. (Accessed 2 March 2013).

Smircich, L. (1983). Organizations as shared meanings in *Organizational symbolism*. L. R. Pondy, P. J. Frost, G. Morgan, and T. C. Dandridge (eds.), 55-65. Greenwich, CN: JAI Press

Smith, D. & Katz, J.S. (2000). Collaborative approaches to research: HEFCE fundamental review of research policy and funding. Retrieved April 28th, 2014, from www.nerf-uk.org/nerf/word/webcolabhefce.doc?version=1

Snyder L. & Wilson C. (1998) Decision making inaction: Applied knowledge Management. www.knowledgeharvesting.org/papers.htm

Sonnenwald, D. H. & Liewrouw, L. A. (1997). Collaboration during the design process: a case study of communication, information behaviour, and project performance. In: P. Vakkari, R. Savolainen and B. Dervin, eds. Information seeking in context: proceedings of an international conference on research in information needs, seeking and use in different contexts, 14-16 August, Tampere, Finland. London: Taylor Graham, 179-204.

South Africa.info, (2012). South African Universities. Retrieved Monday 16th July, 2012. From www.southafrica.info/about/education/universities.htm

Stanton, J. and Nicholson, S. (2005) Biblioming for Library decision making (Vol.1 PP.282-283) Mehd-Khrosrow-pour USA. Encyclopedia of.Information of Science and Technology.

Stoan, S. K. (1991). Research and information retrieval among academic researchers: implication for library instruction. *Library Trends* 39(3), 238-257.

Suber, Peter, (2012). "Ensuring open access for publicly funded research", BMJ, 345:e5184, http://www.bmj.com/content/345/bmj.e5184#ref-2

Subramanyam K. (1982) Bibliometric study of research collaboration: A review, *Journal of Information Science, 6(1982) 33-38*.

Sullivan, H. & Skelcher, C. (2002) *Working Across Boundaries: Collaboration in Public Services.* Basingstoke, Palgrave Macmillan.

Suurla, R., Markkula, M. and Mustajarvi, O. (2002). Developing and implementing knowledge management in the Parliament of Finland. http://www2.eduskunta.fi/fakta/edustaja/ecprd/KM_Finnish_Parliament.pdf (accessed 10.03.13).

Syed Ikhsan. S.O.S. & Rowland, F. (2004). Benchmarking knowledge management in a public organization in Malaysia, *Benchmarking: An International Journal*, 11 (3): 238-266.

Symposium on Open Access and the Public Domain in Digital Data and Information For Science. UNESCO Headquarters, Paris, France, 10 November 2003. Retrieved 12 March, 2012 from: http://www.nap.edu/html/openaccess/81-84.pdf

Teo, T. (2009). Modelling technology acceptance in education: A study of pre-service teachers. Computers & Education, 52(2), 302-312. http://dx.doi.org/10.1016/j.compedu.2008.08.006

Teten, D. & Allen, S. (2005). The Virtual Handshake: Opening Doors and Closing Deals Online. New York: American Management Association.

The Association of Commonwealth Universities, London, UK. Retrieved 19 April 2014 from: http://www.acu.ac.uk/member_services/research_and_policy_analysis/africa_social_sciences/strengthening_research#nairobi

The Times Higher Education World Rankings 2011 – 2012. Retrieved 25 September, 2013 from: http://www.timeshighereducation.co.uk/world-university-rankings/2011-2012/top-400.html

Thompson, G. (1996) *Markets, Hierarchies and Networks: The Coordination of Social Life.* London, Sage.

Thompson, H. (2005) “Building local capacity via scalable Web-based services.”*Encyclopedia of Information science and technology* (vol.I, PP 312) Mehd- khrosrow-pour USA.

Thompson, R., Compeau, D. & Higgins, C. (2006). Intentions to use information technologies: An integrative model. *Journal of Organizational and End User Computing,* 18(3), 25-43. [Online] Available at: http://dx.doi.org/10.4018/joeuc.2006070102 [Accessed 20 July 2013]

Tire, M. (2006), An evaluation of the information dissemination mechanisms for small scale subsistence farmers. M. A. Philosophy. University of Stellenbosch, Cape Town, available at: http://ir.sun.ac.za/dspace/bitstream/10019/135/1/TireM.pdf (accessed 15 October 2014).

Tjepkema et al. (2000). Tjepkema, S; Mulder, M.; Horst, H.M. ter; Scheerens, J. Future challenges for human resource development professionals in Europe: Results of a survey in learning oriented organisations in seven countries in the European Union. Enschede: University of Twente. Available at: http://improving-ser.sti.jrc.it/default/ (accessed 20 March 2013)

Treaty on Access to Knowledge, (2005) http://www.cptech.org/a2k/a2k_treaty_may9.pdf

Ugah, A. D. (1993). Preservation of library and information materials in the Nigerian Defence Academy Kaduna. Unpublished BLIS project. Zaria: ABU

Ugah, A. D. (2000). “Information explosion and the challenges of information packaging in the new Millennium” Paper presented at the 20th Annual conference of the Nigeria Library Association.

Ugah, A.D. (2008). Information explosion and challenges of packaging in the new Millennium. Paper presented at the 20th Annual Cataloguing, Classification and Indexing Seminar Workshop at Enugu (22nd -28th Oct.)

Uhegbu, A. N. (2002). The information user: Issues and themes. Enugu: John Jacobs Classics

Uhegbu, A. N. (2007). *The information user: Issues and themes* (2nd Ed.). Okigwe: Whytem Prints.

Uit Beijerse, R. P. (1999). Questions in knowledge management: defining and conceptualizing a phenomenon. *Journal of Knowledge Management*, 3(2), 94-110.

Umar B. D. (2009) Assessment of Information Literacy among academies in Ahmadu Bello University Zaria. Unpublished MLS thesis, Department of Library and Information Science. Ahmadu Bello University, Zaria.

Umozurike, U. O. (1997). The African Charter on Human and Peoples Rights.

United Nations Department of Public Information (1995). Yearbook of the United Nations: UN Fiftieth Anniversary 1945-1995. The Hague: Martinus Nijhoff Publishers.

United Nations World Summit on Information Society (2014) https://www.itu.int/wsis/basic/about.html (accessed: 17 December, 2014)

Van den Brink, P. (2003). Social, Organizational and Technological Conditions That Enable Knowledge Sharing, Ph.D thesis, University of Amsterdam, Holland.

Van den Hooff, B., Vijvers, J. and de Ridder J. (2003). “Foundations and Applications of a Knowledge Management Scan”, *European Management Journal*, Vol. 21, pp. 237-246.

Van House, N., Butler, M.H. and Schiff, L.R. (1998). Cooperative knowledge work and practices of trust: sharing environmental planning data sets. In: CSCW '98: proceedings of the ACM Conference on computer supported co-operative work, November 14-18, Seattle, WA. ACM, 335-43.

Vandeyar, S. (2010). Shifting selves: Constructing and negotiating academic identities. *South African Journal of Education*, 24(6), 914-934.

von Krogh, G. (1998). Care in knowledge creation. *California Management Review*, 40 (3), 133-153.

Walsh, J. P., W. M. Cohen, C. Cho. (2007). where excludability matters: Material versus intellectual property in academic biomedical research. *Research Policy* 36(8) 1184-1203.

Walsh, Taylor, (2011). Unlocking the Gates, Princeton University Press, http://books.google.co.uk/books?id=uudfxXEmyG0C pp.xvii-xix.

Wang, S. and Noe, R. A. (2009). Knowledge sharing: a review and directions for future research. *Expert Systems with Applications*, 20(2), 115-131.

Wang, Y., Yishan, W., Yuntao, P., & Zheng, M. (2003). Status of collaboration in science and technology in China as reflected in co-authorship. In: J. Guohua, R. Rousseau & W. Yishan. *Proceedings of the 9th International Conference on Scientometrics and Informetrics* – ISSI, 421-429

Wasko, M. M. and Faraj, S. (2005). Why should i share? Examining social capital and knowledge contribution in electronic networks of practice. *MIS Quarterly*, 29 (1), 35- 47.

Webb, J., Gannon-Leary, P. and Bent, M., (2007). Providing Effective Library Services for Research. Facet publishing, London.

Weber, B., & Weber, C. (2007). Corporate venture capital as a means of radical innovation: Relational fit, social capital, and knowledge transfer. *Journal of Engineering and Technology Management*, 24(1), 11-35.

Webster, F. 2002. Theories of the information society. 2nd edition. London: Routledge.

Weigand, D. E. (1993). Grounded theory and qualitative methodology *IFLA Journal* 19(2):17-26.

Wenger, E (1998). Communities of practice: Learning, meaning and identity. Cambridge: Cambridge University Press.

Westell, Tracy (2005). “Measuring Non-Academic Outcomes in Adult Literacy Programs: A Literature Review.” Toronto, Ontario. Retrieved 21 October 2014: http://www.nald.ca/fulltext/measuring/measuring.pdf

What is Social Networking? [online], Available at: http://www.whatissocialnetworking.com/, [accessed 20 October 2014]

Willcoxson, L. (2003).Creating the HRM context for knowledge management, *in Human resource management: challenges and future directions*, B Millett & R Wiesner (eds.), John Wiley & Sons, Australia.

Willis, J. W. (2007). *Foundations of Qualitative Research: Interpretive and Critical Approaches*, Thousand Oaks, Calif.: Sage.

Wilson, J. (2000), "Volunteering", *Annual Review of Sociology*, Vol. 26, pp. 215-240.

Womboh, S. H. & Margaret, B. D. (2002*) Information Science Management and Resource Sharing*, Yola: Paraclete publishers

World Bank (2009), "Knowledge for development – about", available at: http://go.worldbank.org/94MMDLIVF0 (accessed 18 November 2014).

World Summit on Information Society. (2003). Declaration of principles (WSIS) [Online]. http://www.itu.int/wsis/geneva/official/dop/html (accessed 16 December 2014).

Ya'Acob, A., Nor, M.F.N and Azman, H. (2005). Implementation of Malaysian Smart Schools: An investigation of teaching-learning practices and teacher-student readiness. *Internet Journal of e-Language Learning and Teaching* 2(2): 16-26

Yang, J.T. (2004). Job –related knowledge sharing: comparative case studies. *Journal of Knowledge Management*, 8(3), 118-126.

Ye, Q., Li, T. and Law, R. 2011. A co-authorship network analysis of tourism and hospitality research collaboration. *Journal of Hospitality & Tourism Research.* [Online] Available at: http://units.sla.org/division/dst/Annual%20Conference/2009_Washington/Citation [Accessed 31 January 2015].

Ye, S., Chen, H., and Jin, X., (2006). "Exploring the Moderating Effects of Commitment and Perceived Value of Knowledge in Explaining Knowledge Contribution in Virtual Communities", Proceedings of the Tenth Asia Pacific Conference on Information Systems (PACIS 2006), Kuala Lumpur, Malaysia.

Yi, M. & Hwang, Y. (2003). Predicting the use of web-based information systems: Self-efficacy, enjoyment, learning goal orientation, and the technology acceptance model. *International Journal of Human-Computer Studies*, 59, 431-449. [Online] Available at: http://dx.doi.org/10.1016/S1071-5819(03)00114-9 [Accessed 20 July 2013]

Yoshikane, F., & Kageura K. (2003). Comparative analysis of co-authorship networks of different domains: the growth and change of networks. In: J. Guohua, R. Rousseau & W. Yishan. *Proceedings of the 9th International Conference on Scientometrics and Informetrics* – ISSI, 362-367

Yousafzai, S. Y. Foxall, G. R. and Pallister, J. G. (2007). Technology acceptance: a meta-analysis of the TAM: Part 1, *Journal of Modelling in Management, 2(3), 251-280.*

Yu, Q., Shao, H. and Duan, Z. 2012. The research collaboration in Chinese cardiography and cardiovasology field. *International Journal of Cardiography*, 2012 Mar 26: 1-6.

Yu, Z., Yanfei, W., and Hailin, L. (2007). Innovative Capabilities in the Process of Knowledge Sharing to Firm Performance. *International Conference Wireless Communications, networking and Mobile Computing*.

Zeidberg, D. (1987). We have met the enemy: Collection security in Libraries. Rare Books and Manuscript Librarianship 19:2

APPENDICES

Appendix A

Research design summary table

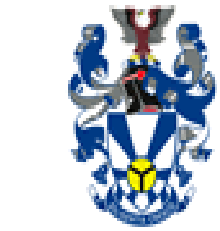
Aim of the study	Objectives of the study	Research Questions	Research Method	Research Instruments used	Chapter Location	Target Population
The aim of this study is to investigate the information and knowledge sharing activities of selected universities in Nigeria and South Africa.	1. Explore the type(s) of information and knowledge shared among academics in the selected universities.	1. Do the academics share Information and knowledge? 2. What type of information and knowledge do the academics share?	Survey	Questionnaire	1, 3, 6, 7 & 8	Academics
	2. Determine the academics' reasons for information and knowledge sharing.	3. Why do the academics share information and knowledge?	Survey	Questionnaire	1, 2, 3, 6, 7 & 8	Academics
	3. Determine the ways and extent to which the academics share information	4. How do the academics share information and knowledge? 5. How often	Survey	Questionnaire	1, 2, 3, 6, 7 & 8	Academics

	and knowledge.	do the academics share information and knowledge?				
	4. Explore the types of ICTs used for information and knowledge sharing by the academics.	6. What types of information and communication technologies (ICTs) do the academics use for information and knowledge sharing?	Survey	Questionnaire	2, 3, 6, 7, & 8	Academics
	5. Investigate the effects of information and knowledge sharing on teaching, research, self-development, and community service in the selected universities.	7. How does information and knowledge sharing affect the academics in teaching, research, self-development, and community service?	Survey	Questionnaire	3, 6, 7 & 8	Academics
	6. Examine the	8. What are the challenges	Survey	Questionnaire	3, 6, 7 & 8	Academics

	challenges to information and knowledge sharing among the academics.	to information and knowledge sharing?				
	7. To identify the common solution to effective information and knowledge sharing	9. What are the common solutions to the identified problems?	Survey	Questionnaire	3, 6, 7 & 8	Academics
	8. Analyse the research collaboration trends in the two countries through the application of informetric using co-authorship as a measure of collaboration.	10. What is the trend in research collaboration among the academics from 2003 to 2013?	Bibliometrics	Online Database (Scopus)	5, 6, 7 & 8	Research publications between 2003 to 2013

Appendix B

Questionnaire



Department of Information Studies

Faculty of Arts

Dear Respondents,

I am a PhD student in the above named department undertaking a study entitled, "Information and knowledge sharing among academics in selected universities in Nigeria and South Africa". The aim of this study is to bring to light the challenges associated with information and knowledge sharing with a view to establishing a model for improvement towards enhanced research output and collaboration.

The information requested is purely for research purposes, and thus, will be treated as confidential. Your identity will not be revealed. Kindly respond to the questions posed. Filling the questionnaire will not take more than 15-20 minutes. Thanks for your anticipated co-operation.

Yours sincerely,

Fari, S. A.

Safari3152@yahoo.com

+27780464562 (SA), +2348033063623(NIG.)

Superviser: Prof. D N Ocholla OchollaD@unizulu.ac.za; 0359026484

SECTION A: BIODATA

Please tick the appropriate response

Your name please ----------

1. Gender: **Male** [ ] **Female** [ ]
2. Your discipline: **Humanities** [ ] **Natural Sciences** [ ] **Applied Sciences** [ ]
3. Your highest educational qualification? **PhD** [ ] **Masters** [ ] **Bachelor** [ ]
4. Rank: (Graduate assistant, Senior lecturer, professor etc) ----------
5. Years of experience: **0-10** [ ] **11-20** [ ] **21-30** [ ] above **30** [ ]
6. Nationality: **Nigerian** [ ] **South African** [ ] **Other Countries** [ ]
7. Institution: ABU ( ) FUT ( ) UMYU ( ) DUT ( ) UKZN ( ) UZ ( )

SECTION B: INFORMATION AND KNOWLEDGE SHARING

1. Do you understand the concept of information/knowledge sharing? Yes[ ] No[ ]

2. Do you participate in information/knowledge sharing? Yes[ ] No[ ]

3. If No, why? ----------

4. Indicate the type of information you share	**Very Much**	**Much**	**Less**	**Never**	**Undecided**
4.1 Information on conferences, workshops and seminars	( )	( )	( )	( )	( )
4.2 Information on scholarship availability	( )	( )	( )	( )	( )
4.3 Information on part-time, visiting and sabbatical jobs	( )	( )	( )	( )	( )
4.4 Information on teaching methods/class management	( )	( )	( )	( )	( )
4.5 Information on new technologies	( )	( )	( )	( )	( )
4.6 Information on current/on-going researches	( )	( )	( )	( )	( )
4.7 Information on communal activities	( )	( )	( )	( )	( )
4.8 Research supervision	( )	( )	( )	( )	( )
4.9 Research collaboration	( )	( )	( )	( )	( )
4.10 Research students mentoring	( )	( )	( )	( )	( )
4.11 Any other comment ----------					

5. Indicate the type of information you prefer	**Very Much**	**Much**	**Less**	**Never**	**Undecided**
5.1 Information on conferences, workshops and seminars	( )	( )	( )	( )	( )
5.2 Information on scholarship availability	( )	( )	( )	( )	( )
5.3 Information on part-time, visiting and sabbatical jobs	( )	( )	( )	( )	( )
5.4 Information on teaching methods/class management	( )	( )	( )	( )	( )
5.5 Information on new technologies	( )	( )	( )	( )	( )

5.6 Information on current/on-going research ( ) ( ) ( ) ( ) ( )

5.7 Information on communal activities ( ) ( ) ( ) ( ) ( )

5.8 Research supervision ( ) ( ) ( ) ( ) ( )

5.9 Research collaboration ( ) ( ) ( ) ( ) ( )

5.10 Research students mentoring ( ) ( ) ( ) ( ) ( )

5.11 Any other comment ----------

6. What are your reasons for information/knowledge sharing?

No.	Reasons	Strongly Agree	Agree	Less Agree	Do not Agree	Undecided
6.1	To avoid duplication of effort					
6.2	To be current in my discipline					
6.3	To become popular among colleagues					
6.4	To be familiar with others in my field					
6.5	To improve collaboration					
6.6	To uncover new ideas					
6.7	To strengthen the academic culture					
6.8	To foster unity among academics					
6.9	To improve research output					
6.10	To support research activities					
6.11	To share information/knowledge					
6.12	To enable free flow of information					
6.13	Any other comment:					

7. Do you use the following ways/patterns for information/knowledge sharing?

No.	Pattern	Strongly Agree	Agree	Less Agree	Do not Agree	Undecided
7.1	Participating in joint publication					
7.2	With academics in my field					
7.3	With academics in my institution					
7.4	With academics in my country					
7.5	Through professional memberships					
7.6	Seminars, conferences and workshops					
7.7	Others (specify)					

8. To what extent do you participate in sharing the following information/knowledge?

No.	Participation	Most often	Often	Less Often	Never	Undecided
8.1	With colleagues					
8.2	Through personal discussions					
8.3	At conferences, seminars and workshops					
8.4	Before undertaking any research					
8.5	On my research progress					
8.6	With colleagues in my discipline only					
8.7	Concerning my field with those outside it					
8.9	Any other comment:					

9. How frequently do you share the following information/knowledge?

No.	Type of information	Most Frequent	Frequent	Less Frequent	Never	Undecided
9.1	Conference, workshops & seminars					
9.2	Information on scholarships					
9.3	Information on additional jobs					
9.4	Information on teaching methods					
9.5	Information on new technologies					
9.6	Current and on-going research					
9.7	Research supervision					
9.8	Research collaboration					
9.9	Students mentoring					
9.7	Any other comment:					

10. **Do you use ICTs for information and knowledge sharing? Yes [ ] No [ ]**

11. Do you use the following ICTs for information/knowledge sharing?

No.	TYPE OF ICT	Very Much	Much	Less	Not at all	Undecided
11.1	Computers	( )	( )	( )	( )	( )
11.2	Mobile phones	( )	( )	( )	( )	( )
11.3	Social media	( )	( )	( )	( )	( )
11.4	Fax machine	( )	( )	( )	( )	( )
11.5	Radio	( )	( )	( )	( )	( )
11.6	Television	( )	( )	( )	( )	( )
11.7	Digital camera/photos	( )	( )	( )	( )	( )
11.8	Internet facilities	( )	( )	( )	( )	( )
11.9	CD-ROMs	( )	( )	( )	( )	( )
11.10	USB drive	( )	( )	( )	( )	( )
11.11	Teleconferencing	( )	( )	( )	( )	( )
11.12	Videoconferencing	( )	( )	( )	( )	( )
11.13	Others (Specify) ----------	( )	( )	( )	( )	( )

12. How frequently do you use the following ICTs in information/knowledge sharing?

No.	ICT Devices/Facilities	Most frequent	Frequent	Less Frequent	Not at all	Undecided
12.1	Computers					
12.2	Mobile phones					
12.3	Social media					
12.4	Fax machine					
12.5	Radio					
12.6	Television					
12.7	Digital camera/photos					
12.8	Internet					
12.9	CD-ROMs					
12.10	USB drive					
12.11	Teleconferencing					
12.12	Videoconferencing					
12.13	Others (Specify):					

13. Do the following problems affect your information/knowledge sharing?

No.	Problems	Very Much	much	Less	Not at all	Undecided
13.1	Inadequate information resources					
13.2	Poor research management					
13.3	Poor communication on seminars, workshops and conferences					
13.4	Poor seminars, workshop and conference attendance					
13.5	Poor support/incentive to attend academic gatherings					
13.6	Negative attitude of sharing among academics					
13.7	Research communication gap					
13.8	Others (specify)					

14. How common could these be in minimizing problems of information/knowledge sharing?

No.	Solutions	Very Common	Common	Less common	Not Common	Undecided
14.1	Provision of enough resources					
14.2	Efficient research management					
14.3	Timely information on seminars, workshops and conferences					
14.4	Improved seminar, workshop and conference attendance					
14.5	Provision of research support					
14.6	Open access					
14.7	Institutional repositories					
14.8	Others (specify)					

15. How do information and knowledge sharing affect you in the following activities?

No.	Activity	Very much	Much	Less affect	Do Not Affect	Undecided
15.1	**Teaching**					
15.1.1	A reliable source for lecture notes					
15.1.2	I get relevant materials for my lecture					
15.1.3	Influences my method of teaching					
15.1.4	A guidance in assessing my students					
15.1.5	Allow others to evaluate my lectures					
15.1.5	Others specify:					
15.2	**Research**					
15.2.1	Access to information for my research					
15.2.2	Awareness about on-going research					
15.2.3	Obtaining relevant input from colleagues					

15.2.4	It is a motivating factor for my research					
15.2.5	Means of publicizing research findings					
15.2.6	Others specify:					
15.3	**Self-Development**					
15.3.1	Acquire information relevant to my field					
15.3.2	A means of keeping abreast of knowledge					
15.3.3	Enhanced productivity					
15.3.4	More exposure					
15.3.5	Wider collaboration					
15.3.6	Others specify:					
15.4	**Community Service**					
15.4.1	Improved community development					
15.4.2	Community recognition					
15.4.3	Effective community self-help techniques					
15.4.4	Wider communication with members					
15.4.5	Way of motivating others to participate					
15.4.6	Others specify:					

Appendix C

Correlation and T-test tables

Correlations (a)

Variables	Types	Types prefer	Reasons	Patterns	Extent	Frequency	Usage of ICT	Frequency of Usage of ICT	Problems	Minimizing problems	Effect of sharing on teaching	Effect of sharing on research	On self-development	On community service	On academic
Types	1	.996(**)	.985(**)	.986(**)	.980(**)	.978(**)	.989(**)	.993(**)	.968(**)	.967(**)	.310(**)	.924(**)	.985(**)	.914(**)	.861(**)
Types prefer	.996(**)	1	.984(**)	.986(**)	.978(**)	.978(**)	.983(**)	.989(**)	.972(**)	.966(**)	.312(**)	.918(**)	.984(**)	.906(**)	.858(**)
Reasons	.985(**)	.984(**)	1	.984(**)	.969(**)	.990(**)	.972(**)	.982(**)	.985(**)	.984(**)	.321(**)	.889(**)	.979(**)	.863(**)	.844(**)
Patterns	.986(**)	.986(**)	.984(**)	1	.982(**)	.980(**)	.972(**)	.983(**)	.970(**)	.971(**)	.316(**)	.918(**)	.975(**)	.885(**)	.853(**)
Extent	.980(**)	.978(**)	.969(**)	.982(**)	1	.971(**)	.977(**)	.983(**)	.959(**)	.954(**)	.294(**)	.956(**)	.979(**)	.934(**)	.863(**)
Frequency	.978(**)	.978(**)	.990(**)	.980(**)	.971(**)	1	.966(**)	.977(**)	.985(**)	.975(**)	.313(**)	.883(**)	.979(**)	.851(**)	.836(**)
Usage of ICT	.989(**)	.983(**)	.972(**)	.972(**)	.977(**)	.966(**)	1	.993(**)	.945(**)	.943(**)	.294(**)	.929(**)	.973(**)	.927(**)	.854(**)
Frequency of usage of ICT	.993(**)	.989(**)	.982(**)	.983(**)	.983(**)	.977(**)	.993(**)	1	.962(**)	.960(**)	.301(**)	.925(**)	.975(**)	.914(**)	.854(**)
Problems	.968(**)	.972(**)	.985(**)	.970(**)	.959(**)	.985(**)	.945(**)	.962(**)	1	.985(**)	.317(**)	.868(**)	.974(**)	.835(**)	.830(**)
Minimizing problems	.967(**)	.966(**)	.984(**)	.971(**)	.954(**)	.975(**)	.943(**)	.960(**)	.985(**)	1	.319(**)	.871(**)	.967(**)	.841(**)	.831(**)
Effect of sharing on teaching	.310(**)	.312(**)	.321(**)	.316(**)	.294(**)	.313(**)	.294(**)	.301(**)	.317(**)	.319(**)	1	.248(**)	.320(**)	.255(**)	.717(**)
Effect of sharing research	.924(**)	.918(**)	.889(**)	.918(**)	.956(**)	.883(**)	.929(**)	.925(**)	.868(**)	.871(**)	.248(**)	1	.917(**)	.971(**)	.841(**)
On self-development	.985(**)	.984(**)	.979(**)	.975(**)	.979(**)	.979(**)	.973(**)	.975(**)	.974(**)	.967(**)	.320(**)	.917(**)	1	.908(**)	.867(**)
On community service	.914(**)	.906(**)	.863(**)	.885(**)	.934(**)	.851(**)	.927(**)	.914(**)	.835(**)	.841(**)	.255(**)	.971(**)	.908(**)	1	.843(**)
On academic	.861(**)	.858(**)	.844(**)	.853(**)	.863(**)	.836(**)	.854(**)	.854(**)	.830(**)	.831(**)	.717(**)	.841(**)	.867(**)	.843(**)	1
N	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219

** Correlation is significant at the 0.01 level (2-tailed). a COUNTRY = NIGERIA

Correlations(a)

Variables	Types	Types prefer	Reasons	Patterns	Extent	Frequency	Usage of ICT	Frequency of Usage of ICT	Problems	Minimizing problems	Effect of sharing on teaching	Effect of sharing on research	On self-development	On community service	On academic
Types	1	.983(**)	.960(**)	.888(**)	.868(**)	.982(**)	.975(**)	.944(**)	.915(**)	.973(**)	.699(**)	.917(**)	.764(**)	.967(**)	.967(**)
Types prefer	.983(**)	1	.933(**)	.899(**)	.863(**)	.985(**)	.984(**)	.969(**)	.938(**)	.972(**)	.731(**)	.921(**)	.782(**)	.974(**)	.976(**)
Reasons	.960(**)	.933(**)	1	.911(**)	.891(**)	.970(**)	.918(**)	.860(**)	.831(**)	.932(**)	.537(**)	.922(**)	.780(**)	.955(**)	.946(**)
Patterns	.888(**)	.899(**)	.911(**)	1	.957(**)	.939(**)	.855(**)	.802(**)	.761(**)	.853(**)	.466(**)	.955(**)	.887(**)	.938(**)	.940(**)
Extent	.868(**)	.863(**)	.891(**)	.957(**)	1	.905(**)	.812(**)	.755(**)	.746(**)	.811(**)	.454(**)	.902(**)	.855(**)	.885(**)	.890(**)
Frequency	.982(**)	.985(**)	.970(**)	.939(**)	.905(**)	1	.970(**)	.945(**)	.902(**)	.962(**)	.654(**)	.951(**)	.814(**)	.988(**)	.987(**)
Usage of ICT	.975(**)	.984(**)	.918(**)	.855(**)	.812(**)	.970(**)	1	.989(**)	.953(**)	.977(**)	.790(**)	.884(**)	.715(**)	.954(**)	.957(**)
Frequency of usage of ICT	.944(**)	.969(**)	.860(**)	.802(**)	.755(**)	.945(**)	.989(**)	1	.959(**)	.952(**)	.825(**)	.834(**)	.623(**)	.921(**)	.930(**)
Problems	.915(**)	.938(**)	.831(**)	.761(**)	.746(**)	.902(**)	.953(**)	.959(**)	1	.930(**)	.830(**)	.790(**)	.605(**)	.879(**)	.883(**)
Minimizing problems	.973(**)	.972(**)	.932(**)	.853(**)	.811(**)	.962(**)	.977(**)	.952(**)	.930(**)	1	.733(**)	.881(**)	.700(**)	.949(**)	.947(**)
Effect of sharing on teaching	.699(**)	.731(**)	.537(**)	.466(**)	.454(**)	.654(**)	.790(**)	.825(**)	.830(**)	.733(**)	1	.496(**)	.327(**)	.626(**)	.646(**)
Effect of sharing research	.917(**)	.921(**)	.922(**)	.955(**)	.902(**)	.951(**)	.884(**)	.834(**)	.790(**)	.881(**)	.496(**)	1	.885(**)	.970(**)	.975(**)
On self-development	.764(**)	.782(**)	.780(**)	.887(**)	.855(**)	.814(**)	.715(**)	.623(**)	.605(**)	.700(**)	.327(**)	.885(**)	1	.828(**)	.842(**)
On community service	.967(**)	.974(**)	.955(**)	.938(**)	.885(**)	.988(**)	.954(**)	.921(**)	.879(**)	.949(**)	.626(**)	.970(**)	.828(**)	1	.998(**)
On academic	.967(**)	.976(**)	.946(**)	.940(**)	.890(**)	.987(**)	.957(**)	.930(**)	.883(**)	.947(**)	.646(**)	.975(**)	.842(**)	.998(**)	1
N	92	92	91	92	92	92	91	82	92	92	92	92	92	92	92

** Correlation is significant at the 0.01 level (2-tailed). a COUNTRY = SOUTH AFRICA

Combined (Nigeria and South Africa)

Variables	Types	Types prefer	Reasons	Patterns	Extent	Frequency	Usage of ICT	Frequency of Usage ICT	Problems	Minimizing problems	Effect of sharing on teaching	Effect of sharing on research	On self-development	On community service	On academic
Types	1	.991(**)	.908(**)	.925(**)	.874(**)	.974(**)	.963(**)	.968(**)	.506(**)	.918(**)	.281(**)	.760(**)	.790(**)	.858(**)	.830(**)
Types prefer	.991(**)	1	.924(**)	.936(**)	.883(**)	.970(**)	.955(**)	.964(**)	.495(**)	.920(**)	.285(**)	.771(**)	.818(**)	.840(**)	.839(**)
Reasons	.908(**)	.924(**)	1	.974(**)	.958(**)	.929(**)	.923(**)	.943(**)	.199(**)	.793(**)	.209(**)	.887(**)	.955(**)	.823(**)	.868(**)
Patterns	.925(**)	.936(**)	.974(**)	1	.975(**)	.945(**)	.941(**)	.951(**)	.217(**)	.790(**)	.207(**)	.900(**)	.920(**)	.876(**)	.876(**)
Extent	.874(**)	.883(**)	.958(**)	.975(**)	1	.901(**)	.920(**)	.924(**)	.090	.698(**)	.149(**)	.950(**)	.943(**)	.898(**)	.876(**)
Frequency	.974(**)	.970(**)	.929(**)	.945(**)	.901(**)	1	.961(**)	.970(**)	.437(**)	.890(**)	.260(**)	.775(**)	.812(**)	.854(**)	.830(**)
Usage of ICT	.963(**)	.955(**)	.923(**)	.941(**)	.920(**)	.961(**)	1	.993(**)	.310(**)	.810(**)	.212(**)	.847(**)	.841(**)	.926(**)	.856(**)
Frequency of usage of ICT	.968(**)	.964(**)	.943(**)	.951(**)	.924(**)	.970(**)	.993(**)	1	.312(**)	.832(**)	.219(**)	.858(**)	.881(**)	.905(**)	.861(**)
Problems	.506(**)	.495(**)	.199(**)	.217(**)	.090	.437(**)	.310(**)	.312(**)	1	.734(**)	.342(**)	-.103	-.011	.131(*)	.172(**)
Minimizing problems	.918(**)	.920(**)	.793(**)	.790(**)	.698(**)	.890(**)	.810(**)	.832(**)	.734(**)	1	.348(**)	.537(**)	.634(**)	.640(**)	.691(**)
Effect of sharing on teaching	.281(**)	.285(**)	.209(**)	.207(**)	.149(**)	.260(**)	.212(**)	.219(**)	.342(**)	.348(**)	1	.068	.146(*)	.132(*)	.573(**)
Effect of sharing research	.760(**)	.771(**)	.887(**)	.900(**)	.950(**)	.775(**)	.847(**)	.858(**)	-.103	.537(**)	.068	1	.927(**)	.891(**)	.843(**)
On self-development	.790(**)	.818(**)	.955(**)	.920(**)	.943(**)	.812(**)	.841(**)	.881(**)	-.011	.634(**)	.146(*)	.927(**)	1	.780(**)	.849(**)
On community service	.858(**)	.840(**)	.823(**)	.876(**)	.898(**)	.854(**)	.926(**)	.905(**)	.131(*)	.640(**)	.132(*)	.891(**)	.780(**)	1	.834(**)
On academic	.830(**)	.839(**)	.868(**)	.876(**)	.876(**)	.830(**)	.856(**)	.861(**)	.172(**)	.691(**)	.573(**)	.843(**)	.849(**)	.834(**)	1
N	311	311	310	311	311	311	310	301	311	311	311	311	311	311	311

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed)

Group Statistics

Variables	Country	N	Mean	Std. Deviation	Std. Error	t-value	DF	P	Remarks
Types	Nigeria	219	3.6142	1.10014	.07434	1.011	309	.313	NS
	South Africa	92	3.7402	.72066	.07513				
Types prefer	Nigeria	219	3.5900	1.14819	.07759	1.376	309	.170	NS
	South Africa	92	3.7641	.60339	.06291				
Reasons	Nigeria	219	3.7504	1.10970	.07499	7.580	308	.000	Sig
	South Africa	91	4.6511	.35222	.03692				
Patterns	Nigeria	219	3.5540	1.13657	.07680	6.823	309	.000	Sig
	South Africa	92	4.4149	.63788	.06650				
Extent	Nigeria	219	3.2100	1.07361	.07255	9.481	309	.000	Sig
	South Africa	92	4.3463	.63083	.06577				
Frequency	Nigeria	219	3.5378	1.10358	.07457	2.491	309	.013	Sig
	South Africa	92	3.8563	.82337	.08584				
Usage of ICT	Nigeria	219	3.3573	.79030	.05340	4.658	308	.000	Sig
	South Africa	91	3.7958	.66065	.06926				
Frequency of usage of ICT	Nigeria	219	3.3212	.82270	.05559	5.287	299	.000	Sig
	South Africa	82	3.8455	.58709	.06483				
Problems	Nigeria	219	4.1370	.76054	.05139	24.710	309	.000	Sig
	South Africa	92	2.1009	.32846	.03424				
Minimizing problems	Nigeria	219	4.3144	.63794	.04311	3.970	309	.000	Sig
	South Africa	92	4.0419	.24747	.02580				
Effect of sharing on teaching	Nigeria	219	2.6667	2.09125	.14131	3.568	309	.000	Sig
	South Africa	92	1.8870	.16322	.01702				
Effect of sharing research	Nigeria	219	3.3489	.86922	.05874	13.599	309	.000	Sig
	South Africa	92	4.6348	.39626	.04131				
On self-development	Nigeria	219	3.5032	1.14047	.07707	12.105	309	.000	Sig
	South Africa	92	4.9457	.08946	.00933				
On community service	Nigeria	219	2.0511	1.04378	.07053	6.782	309	.000	Sig
	South Africa	92	2.9761	1.21704	.12688				
On academic	Nigeria	219	2.8925	1.02474	.06925	6.468	309	.000	Sig
	South Africa	92	3.6109	.44536	.04643				

Note: NS = Not significant, Sig = Significant

Appendix D

Research Permits

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

6 November 2013

Mr Sani Fari Abdu
Department of Information Studies
UNIVERSITY OF ZULULAND
Student No. 201100888
Email: safari3152@yahoo.com

Dear Mr Abdu

RE: PERMISSION TO CONDUCT RESEARCH

Gatekeeper's permission is hereby granted for you to conduct research at the University of KwaZulu-Natal towards your postgraduate studies, provided Ethical clearance has been obtained. We note the title of your research project is:

"Comparative study on information and knowledge sharing among academics in Nigeria and South Africa".

It is noted that you will be constituting your sample with a request for responses on the website. A copy of this letter (Gatekeeper's approval), the ethical clearance and the questionnaire must be sent to (govenderlog@ukzn.ac.za) or (ramkissoonb@ukzn.ac.za) which will be placed on UKZN notice system http://notices.ukzn.ac.za. You are not authorized to distribute the questionnaire to staff and students using Microsoft Outlook address book.

Please note that the data collected must be treated with due confidentiality and anonymity.

Yours sincerely

Professor J J Meyerowitz
REGISTRAR

Office of the Registrar
Postal Address: Private Bag X54001, Durban, South Africa
Telephone: +27 (0) 31 260 8005/2206 **Facsimile:** +27 (0) 31 260 7824/2204 **Email:** registrar@ukzn.ac.za
Website: www.ukzn.ac.za

Directorate for Research and Postgraduate Support
Durban University of Technology
Tromso Annexe, Steve Biko Campus
P.O. Box 1334, Durban 4000
Tel.: 031-3732576/7
Fax: 031-3732946
E-mail: moyos@dut.ac.za

4th June 2013

Mr Sani Abdu Fani
c/o Department of Information Studies
University of Zululand

Dear Mr Fani

PERMISSION TO CONDUCT RESEARCH AT THE DUT

Your email correspondence in respect of the above refers. I am pleased to inform you that the Institutional Research Committee (IRC) will grant permission to you to conduct your research at the Durban University of Technology.

We would be grateful if a summary of your key research findings can be submitted to the IRC on completion of your studies.

Kindest regards.
Yours sincerely

PROF. S. MOYO
DIRECTOR: RESEARCH AND POSTGRADUATE SUPPORT

DEPUTY VICE-CHANCELLOR,
RESEARCH AND INNOVATION

UNIVERSITY OF ZULULAND
Website: http://www.uzulu.ac.za

Private Bag X1001
KwaDlangezwa 3886

Tel: 035 902 6634
Fax: 035 902 6222
Email: MsowoyaT@unizulu.ac.za

Mr Sani Fari Abdu
UNIZULU

25 June 2013

Dear Mr Abdu

REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT UNIZULU: "INFORMATION SHARING AMONG ACADEMICS IN NIGERIA AND SOUTH AFRICA"

Prof Ocholla's letter dated 24 June 2013 refers.

I hereby grant approval for you to conduct your research at UNIZULU, as per the methodologies stated in your project description document and the application for ethical clearance.

I note that you have obtained the required ethical clearance certificate (certificate number- UZREC 171110-030 PGD 2013/23).

I wish you well in your research.

Yours sincerely

Professor Rob Midgley
Deputy Vice-Chancellor, Research and Innovation

PROF. JR MIDGLEY
DEPUTY VICE-CHANCELLOR
RESEARCH & INNOVATION

25 JUN 2013

UNIVERSITY OF ZULULAND
PRIVATE BAG X1001
KWADLANGEZWA, 3886

cc Prof D Ocholla

"Restructured for Relevance"

AHMADU BELLO UNIVERSITY, ZARIA
DIRECTORATE OF ACADEMIC PLANNING & MONITORING
e-mail: dapm@abu.edu.ng
Vice Chancellor: *Prof.. Abdullahi Mustapha B.Sc. (Hons) Pharm (A.B.U.), Ph.D (London), FPSN*
Director: *Prof. Kabir Bala B.Sc. (Hons), M.Sc., MBA, Ph.D (ABU), FNIOB, MBEng, MSCIarb, MIAHS, MAPM*

DAPM/COM/30c/18

17th July, 2013

The Head,
Department of Information Studies,
University of Zululand,
South Africa.

Dear Sir,

RE: PERMISSION TO CONDUCT RESEARCH IN YOUR UNIVERSITY

Please refer to your letter dated 11th April, 2013 on the above subject.

I write to convey approval to Mr. Sani Abdu Fari to conduct a comparative study on information and knowledge sharing among academics in Nigeria and South Africa in Ahmadu Bello University, Zaria.

Thank you.

Yours faithfully,

Salisu Aliyu
For Director.

Federal University of Technology, Minna

P.M.B. 65, Minna, Niger State, Nigeria.

VICE-CHANCELLOR:
Prof. M. A. Akanji, *B.Sc (Ibadan) M.Sc.; Ph.D. (Ife), FNSBMB*
REGISTRAR:
V. N. KOLO (MRS.), *B.Sc. (Hons); MPA (ABU), MNIM, ACIPM*

Tel: +234 (0) 66 223275
Fax: +234 (0) 66 220766
Telegram: FUTECH, Minna
E-mail: registry@futminna.edu.ng.

OFFICE OF THE REGISTRAR

Your Ref:

Our Ref: R/EXT/16

11th June, 2013

Prof. D.N. Ocholla,
The Head,
Department of Information Studies,
University of Zululand,
KwaDlangezwa,
South Africa.

RE: PERMISSION TO CONDUCT RESEARCH IN YOUR INSTITUTION: MR SANI ABDU FARI

Please, refer to your letter dated 11th April, 2013 on the above subject matter.

I have been directed to convey the Vice-Chancellor's approval for Mr. Sani Abdu Fari a registered Ph.D student in the Department of Information Studies of your Institution to conduct a Research in Federal University of Technology, Minna.

Thank you.

Idris Salamatu
AA(Establishment)
For: Registrar

UMARU MUSA YAR'ADUA UNIVERSITY

P.M.B. 2218, KATSINA
KATSINA STATE, NIGERIA
OFFICE OF THE REGISTRAR
Registrar@umyu.edu.ng

Vice-Chancellor:- Professor Muuta Ibrahim, MBBS (ABU), FMCpaed (Nig), FWACP (W.A), PGDipMedEd (Dundee). E-mails: (i) vicechancellor@umyu.edu.ng. (ii) imuuta@hotmail.com
Registrar:- Abdu Halliru Abdullahi B Sc Pol. Sc. (ABU), MA (PSA) Brunel, MNIM E- mail: abduabdullahi@umyu.edu.ng

UMYU/REG/PER/000252/VOL.I/100
26th June, 2013 (Sha'aban 17, 1434AH)

The Head of Department
Information Studies
University of Zululand
Kwadlangezwa, South Africa

RE: PERMISSION TO CONDUCT RESEARCH IN YOUR UNIVERSITY

Reference to your letter dated 11th April, 2013 on the above subject; I am directed to convey approval of the Committee of Deans and Directors of Umaru Musa Yar'adua University, Katsina for Sani Abdu Fari to conduct his PhD research in the University as you requested.

2. Thank you.

Ma'a Balarabe
Establishment Secretary
For: Registrar