Re-Engineering Research and Innovation Information in University Libraries in Uganda for Small and Medium Enterprises

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ABSTRACT

Globally, enormous amounts of research are generated in universities; however, in Uganda, not much of this research cascades to Small and Medium Enterprises (SMEs) which contribute 75% of the nation's Gross Domestic Product (GDP). Since university libraries are expected to support teaching, learning, research and community engagement in the surrounding communities, these libraries ought to reposition themselves to become conduits of disseminating Research and Innovation (R&I) to SMEs and other partners in development.

The purpose of this study was to investigate how university libraries in Uganda can repackage R&I information and disseminate it to SMEs. The study addresses two broad objectives namely: 1) To investigate how University libraries in Uganda are facilitating access to R&I information for use by SMEs in the agricultural sector in Uganda; and 2) To find out the extent to which University libraries in Uganda repackage R&I information for use by SMEs in the agricultural sector.

This study was underpinned by three theories namely: LibQUAL+™, Modern theories of management and Wilson's 1999 model of Information seeking behaviour. The study adopted a post-positivist research paradigm and an exploratory research design. Mixed methods epistemology was employed. Quantitative and qualitative data were therefore collected from a large sample of respondents from 6 universities that offer graduate agricultural programmes and from 231 SMEs in the agricultural sector. The respondents consisted of university librarians, heads of library research and innovation units, university heads of IT, Agricultural academic staff, graduate agricultural students and proprietors of SMEs in the agricultural sector in the central region of Uganda. Quantitative data was analysed using SPSS to generate descriptive and inferential statistics where frequencies, percentages and chi square were used, while the qualitative data was analysed through content analysis.

The findings revealed that the research carried out in universities was beneficial to SMEs, mainly in areas of increasing the SMEs productivity, identifying training opportunities, and starting up new business ventures. A third of the respondents disclosed that currently Ugandan university libraries do not have an enabling environment for SMEs to access R&I information mainly because of inaccessible format in which R&I information is packaged. However, university libraries could re-engineer their R&I information services to serve SMEs mainly through digitisation, carrying out community engagement programmes targeting SMEs, and repackaging R&I information. The study among others recommended that R&I

information should be repackaged from print to short documentaries, newsletters, using social media, translating it from English to local languages and broadcasting it on radios and televisions to make it suitable for SMEs.

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DEDICATION

I dedicate this work to my sweet and loving Lord, Jesus Christ, without whom, I have nothing in this world.

"**He that spared not his one and only son, but delivered him up for us all, how shall he not with him also, freely give us all things**?" (Romans 8:32)

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LIST OF ABBREVIATIONS

AAU	Association of African Universities
AGORA	Access to Global Online Research in Agriculture
ARL	American Research Libraries
CAS	Current Awareness Services
CD	Compact Disc
CITARD	Communication and Information Technology for Agriculture and Rural Development
COMLA	Commonwealth Library Association
CUUL	Consortium of Uganda University Libraries
EBSCO	Elton B. Stephen's Company
DVD	Digital Video Disc
eIFL	Electronic Information for Libraries Network
FAO	Food and Agricultural Organisation
IFLA	International Federation of Library and Information Associations
HINARI	Health Inter Network Access to Research Initiative
HTML	Hyper Text Machine Language
IL	Information Literacy
IR	Institutional Repository
JSTOR	Journal Store
LARA	Listening, Analysing, Relating and Acting.
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MARC	Machine Readable Catalogue
NAADS	National Agricultural Advisory Services
NARO	National Agricultural Research Organisation
NGOs	Non-Governmental Organisations
OCLC	Online Catalogue of the Library of Congress
OPAC	Online Public Access Catalogue
PDA	Personal Digital Assistant
PMCA	Participatory Market Chain Approach

R&D	Research and Development
R&I	Research and Innovation
RSS	Real Simple Syndication
SCECSAL	Standing Conference of Eastern Central and Southern African Librarians
SDI	Selective Dissemination of Information
SME	Small and Medium Enterprise
SPIDER	Swedish Programme for Information Communication Technology (ICT) in Developing Regions
UBOS	Uganda Bureau of Statistics
UCC	Uganda Communication Commission
UCU	Uganda Christian University
ULIA	Uganda Library and Information Association
UKZN	University of KwaZulu-Natal
UMU	Uganda Martyrs University
UN	United Nations
UNCHE	Uganda National Council of Higher Education
UNCST	Uganda National Council of Science and Technology

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CHAPTER ONE

BACKGROUND TO THE STUDY

"To succeed, jump as quickly at opportunities
as you do at conclusions"
Benjamin Franklin

"Africans are not asking for handouts but for support of their business
ideas, so as to start and sustain their enterprises"
Microbank.com

1.1 Introduction

Many countries in Sub-Saharan Africa are ranked amongst the first forty poorest in the world (Valentina 2016). Some of these countries include Democratic Republic of Congo, Central African Republic, Burundi, Malawi, Liberia, Niger, Guinea, Madagascar, Guinea-Bisau, Uganda, Togo, Ethiopia, and Rwanda (Kingdon, Sandefur & Teal 2006). The World bank (2018) categorises all these nations under the lowest Gross National Income earners per capita of $1,025 or less and they experience high unemployment rates of over 40% (Kingdon et al. 2006). A number of developmental partners like the MasterCard Foundation are concerned about the burgeoning youthful population between 15 and 24 years of age in Africa, a figure expected to double by 2050 (Makoni 2016). These young people are constantly demanding for jobs and food and yet the African economies are not performing well. This is now leading to urban migration, youth poverty in urban centres and increase in crime rates.

Uganda is one of the leading African countries with a young population that is faced with high levels of poverty and unemployment. For example, out of about 400,000 graduates released from Universities in Uganda each year, only 8,000 (2%) have a chance of getting gainful employment (Mugerwa 2015). In contrast, in the developed countries such as Singapore, the unemployment rate is 1.9% (Ministry of Manpower 2015). Singapore and other Asian countries have managed to keep this unemployment rate low by supporting their nationals to run their own enterprises. Many of the young people in Uganda have also attempted to start small scale businesses but they have failed to maintain them due to 'lack of requisite business skills (Sekanjako & Kisige 2017:33).

Globally, Small and Medium Enterprises (SMEs) are contributing significantly to job creation and poverty alleviation, and they are becoming a backbone of many economies

(Kazoora, Acworth, Tondo & Kazungu 2006:14; Oteh 2011:3). SMEs have varying definitions based on the number of employees, annual turnover, and total asset worth. For example, the United States define Small enterprises as those with fewer than 100 employees, while medium-sized businesses are those with fewer than 500 employees (Oteh 2011:2). The South African government defines a small enterprise as having 21-50 employees, and medium enterprise has 51-200 employees (The Republic of South Africa 2003; The Republic of South Africa 1996). For the purpose of this study, the definition of SME as provided by the Ministry of Finance, Planning and Economic Development (2011) and Ministry of Trade, Industry and Cooperatives (2015) in Uganda was adopted. Accordingly, 'Small Enterprises' are those that have 5-50 employees, with an annual turnover and total assets of up to Uganda Shillings 360 million ($ 102,857). In the same vein, 'Medium Enterprises' are firms that employ more than 50 people with an annual turnover and total assets of between Uganda Shillings 360 million to 30 billion ($102,857 to 8,571,428).

Uganda Bureau of Statistics (2011:34-35) carried out a Census of Business Establishments (COBE) in Uganda and it was revealed that they were 458,106 firms. These were made up of Micro, Small, and Medium Enterprises (MSMEs). Majority (70%) of them were micro, 20% were Small, 10% were Medium and none was found to be large (Uganda Bureau of Statistics 2011:35). This means that 30% (137, 432) of the business establishments in Uganda are SMEs. The agriculture sector in Uganda has the 'largest number of SMEs' with 8,168 agricultural businesses registered (Uganda Bureau of Statistics 2011:26). Other leading sectors with high numbers of SMEs are health, energy, information communication technology (ICT), education, manufacturing, and real estate among others. Agricultural SMEs deal in a number of businesses like crop and animal production, mixed farming, floriculture, horticulture, bee keeping, agricultural support services, food and beverage service, and agricultural retail and wholesalers (in pesticides, seeds, agricultural machinery and other agricultural related raw materials), fishing and forestry (Uganda Bureau of Statistics 2011; FSD Africa et al. 2015).

Several funding agencies like MasterCard foundation believe that interventions into agriculture could be a solution to the problems of poverty and unemployment of the Sub Saharan African youth. In response to this, MasterCard foundation supports the Regional Universities Forum for capacity building in agriculture, (RUFORUM)'s approach of 'Linking agricultural universities with the civil society, the private sector, governments and other stakeholders in support of agricultural development (Makoni 2016). Strengthening agriculture

in Africa, by empowering all players such as; researchers, learning institutions, agriculture communities and the private sector can immensely benefit the sector. The benefits can be realised through providing information and knowledge needed to boost the society mainly the informal sector where most agricultural SMEs are found. Many urbanised poor youths could also get an opportunity of engaging in urban agriculture and help meet the rising food demands.

Despite the contribution of SMEs to economic growth and GDP in many countries, they often receive lukewarm support from their governments especially in Africa (Kazoora et al., 2006:25). In Uganda, the economic transformation has been characterised by the proliferation of SMEs which contribute up to 45% of the economic activity yet most of the SMEs 'exhibit low levels of productivity and high levels of informality' (World Bank Group 2018:29). Most governments especially in Africa do not provide adequate support to SMEs by creating an enabling environment for them to thrive (Beyene 2002). SMEs are fragmented and this results in their lack of collective bargaining strength or synergy, weak linkages and networks. The failure of governments to effectively support SMEs leads to lost opportunities (Kazoora et al. 2006). Hall and Nahdy (1999:1) found that the fundamental nature of the relationship between science researchers and the small entrepreneurs in Uganda has largely failed in its attempts to improve access of SMEs to agricultural research.

Most developed countries in contrast have made successful attempts to promote access to research by SMEs. This has enhanced SMEs' access to funding opportunities, research and innovation, increased business opportunities, training, business expert advice and consultancy (OCLC 2014; Arunachalam 2003; Chiware 2010). Similarly in developed countries, university libraries collect and store a variety of Research and Innovation (R&I) information for SMEs. Such information may include information on small scale industries, technology, consultancy on developing business ideas, plans, entrepreneurship, networking, funding opportunities, market research, information on competitors, how to apply for patents, and trademarks among others (Drew, 2007:3-4; Schauder, 1987:36). The R&I information for SMEs can facilitate business growth, poverty alleviation and job creation (Ikoja-Odongo 2002).

1.1.1 University Libraries and SMEs

Huge volumes of research in Africa are generated in universities (Agabirwe 2018), however, not much of this research cascades to SMEs which contribute 75% of the nation's Gross

Domestic Product (Ssengooba et al. 2011; Nakibuule 2015:26). According to the Uganda University and other tertiary institutions' Act 2001, universities have four key functions which are "teaching, learning, research and community outreach" (Republic of Uganda 2006:7; Kyaligonza 2015:60). Among these four functions, research is not only the core upon which teaching and community engagement rests, but it is also of "paramount importance and a contributing factor to innovations and development of any country" (Jowi et al. n.d.:120). University libraries in Uganda have tried to collect and store the research output of their universities, however not much has been done to disseminate these research works to spur national development.

There have been several attempts of measuring the return on university library investment. Some of these attempts have been through measuring the benefits of "using electronic resources and the impact on the productivity of the users" (Markless & Streatfield 2013:44). It is high time to widen the spectrum of measuring the impact of university libraries to include the community of users outside the university campuses such as the SMEs; it is no secret that university libraries are creating a difference in the lives of many people who patronise them regularly. A young lady by the names of Fhatuwani Nemakhavhani hailing from a remote Tswinga village in Limpopo province in South Africa became the first black female actuary to ever be produced by the University of Pretoria (2017). She was proud to admit the secret behind her success was that the library became her second home during her varsity time. Therefore these University library spaces should not only be enjoyed by university students and staff but should also be open to the poor youth and other community members who may wish to excel in their business aspirations. It is from this argument that University libraries through the community engagement function ought to open up their doors to reach out to their neighbouring communities like SMEs.

Since universities are expected to contribute significantly to community development through their research agenda (Owoeye & Oyebade 2010), University libraries in Uganda must therefore reposition themselves to become conduits of disseminating R&I information to SMEs and become partners of government in development (International Federation of Library and Information Associations, 2015). In Malaysia, University libraries harness huge volumes of R&I information for use by SMEs to create jobs, increase productivity and efficiency (Kamarulzaman et al. 2011).

1.2 Statement of the Problem

According to Oteh (2011:5) SMEs especially in developing countries suffer from inadequate infrastructural facilities, shortage of skilled manpower, low level of entrepreneurial skills, lack of a conducive operating environment, restricted market access and cumbersome regulatory requirements. This results in high mortality rate of SMEs (Uganda Bureau of Statistics 2011:10). In addition, SMEs are characterised by information asymmetry, poorly prepared project proposals, inadequate collateral, absence, or unverifiable history of past credit obtained and lack of adequate historical records of the company‘s transaction (Muhanguzi & Kyobe 2014). The lack of information, especially the R&I for SMEs, make it difficult for them to make well-informed and reliable investment decisions (Blackwell et al. 2006:3536).

In Uganda, currently the SME business productivity has remained well below the national norm across all economic sectors, in fact it has significantly declined in the agriculture and service sector (Abanis 2013; Sebikari 2014a). This decline has led to “low activity, turnover, and profits; postponement of new businesses; and capacity constraints” (Lakuma & Sserunjogi 2017:2). The poor business performance especially by SMEs is partly caused by the limited access to research and innovation information. This is more pronounced in the agricultural sector where majority of SMEs are found. Consequently, they are not able to access and use new ideas and technologies to improve and grow their business (Barnett 2004:1). It should be noted here that governments around the world, in spite of their political inclinations, are placing universities in a “far more central place in society” (Follet 2010:56). In the same vein, the Ugandan government and other Sub-Sahara African governments should no longer view universities as institutions that generate highly trained professionals only, but as generators of research that stimulate knowledge-based industries such as SMEs.

In addition, there is little if any innovation being generated by SMEs (Hall 2009:31-39; Odongo et al. 2017). This has engendered debate on how SMEs in the agricultural sector can access and benefit from research and innovations generated by universities (Hall and Nahdy 1999). Currently, it is not known how the agricultural research carried out in universities in Uganda trickles down to SMEs for use to create jobs and for poverty alleviation. Kazoora et al. (2006) expressed concern that the lack of research and innovation information system for SMEs in the agricultural sector results in opportunities to boost entrepreneur capacities and

expands their markets. Besides, SMEs have unique information needs that must be met to enable them play a meaningful role in growing the economy.

Traditionally, university libraries have been predominantly offering push services where they have been providing information in the form of books and other information resources to users. However, from the 1980s and beyond, the libraries push services have been on the decline due to the rise of internet and competition from other information providers like radio, television among others (Nair et al. 2015). There is therefore need for university libraries to switch to pull services if they are to regain their market share of users. One of the pull services is re-engineering their R&I information services for SMEs. In the context of Uganda, Kulabako & Ojambo (2016); Okello-Obura, Minishi-Majanja, Cloete, & Ikoja-Odongo (2007) emphasise on the need for an in-depth investigation into how University library system repackage information. This study therefore investigated how University Library in Uganda repackage and disseminate information on research and innovations for SMEs.

1.3 Research Objectives

The purpose of this study was to investigate how university libraries in Uganda can repackage R&I information and disseminate it to SMEs. The study addressed two broad objectives namely:

1. To investigate how university libraries in Uganda are facilitating access to R&I information for use by SMEs in the agricultural sector.
2. To find out the extent to which university libraries in Uganda repackage R&I information for use by SMEs in the agricultural sector.

1.3.1 Research Questions

The study addressed the following research questions:

1. What R&I information sources and services are provided by university libraries to SMEs in the agricultural sector in Uganda?
2. How can R&I information sources and services be re-engineered and disseminated to SMEs in the agricultural sector by university libraries?
3. What skills and competencies are needed by SMEs in the agricultural sector to effectively access and use R&I sources and information services?

4. What factors and perceptions influence access and utilisation of R&I information sources and services by SMEs in the agricultural sector?
5. What challenges are faced by university libraries in providing R&I information sources and services to SMEs in the agricultural sector?

1.4 Significance of the Study

While a number of studies have been carried out on how university libraries are using the universities' research output to support teaching and learning, not much has been done on how this research output supports SMEs in their entrepreneurial activities (Okello-Obura et al. 2007). This study aimed at addressing this lacuna by investigating how university libraries can re-engineer research and innovation information in Uganda for use by Small and Medium Enterprises (SMEs) in the agricultural sector for job creation and poverty alleviation.

There is supposedly a strong link between the universities and the economic/industrial sector (business, industry and SMEs) in Uganda, however, the link between the two is loose (Jowi et al. n.d.:127). One way the universities can strengthen this link is through community outreach. The Consortium of Uganda University libraries (CUUL) (2016) advocates for supporting information resource sharing to enhance knowledge and research for development. Most Ugandan university libraries concentrate on staff and students of the university, ignoring external researchers and community users (Mwesigwa 2013; Brindley 2010:viii; Griffis 2015:461). This study aimed at uncovering the extent to which university libraries serve external users such as SMEs in Uganda. The outcome of the study is expected to provide evidence-based data upon which relevant university library research and innovation information policies can be formulated. The study also provides data that can inform budget allocation for information communication technology and infrastructure development for digitisation of R&I information, human resource development, and staffing in public university libraries in Uganda (Jowi et al. n.d.). Currently, there is still a wide research gap on the relationship between university libraries community engagement initiatives and SMEs in Uganda which this study intends to address.

1.5 Definition of Key Terms

Institutional Repositories are online platforms that manage and disseminate digital materials created by the institution like a university and its community members. This platform allows a wide range of information materials like working papers, videos, original data sets, lecture

notes, journal articles, conference presentations, audio files, pictures, books and book chapters (Heery & Powell 2006).

Medium Enterprise in Uganda is a business establishment that employs more than 50 workers with an annual turnover and total assets of between Uganda Shillings 360 million to 30 billion ($102,857 to 8,571,428) (Ministry of Trade Industry and Cooperatives 2015).

Re-engineering Libraries is a conscious strategic move to change in library services where library managers reflect on how best to adjust the direction and momentum of their library services to optimally meet the needs of their users. (Brindley 2010).

Repackaging of Information is the transformation process of library resources mainly from print to other formats that can easily be patronised (Iwhiwhu 2008). Libraries can repackage their print information into other formats like audio, videos, braille, pictures, illustrations, from English to local languages, into social media formats, radio, TV, newspapers, magazines among others.

Research and Innovation Information is information collected and managed in university and other research libraries that transforms ideas into new and improved information products, services or processes, in order to enhance enterprises to advance, compete and differentiate themselves successfully in their marketplaces (Nair et al. 2015).

Small Enterprise in Uganda is a business establishment with 5-50 employees, with an annual turnover and total assets of up to Uganda Shillings 360 million ($ 102,857) (Ministry of Trade, Industry and Cooperatives 2015).

University Libraries are academic libraries attached to universities and associated with institutions of higher learning. The major function of these libraries is to support learning, teaching, and research activities of its parent institution and the surrounding community (Sritharan et al. 2016; Walsh 2011; Sawahel 2017).

1.6 Structure of Thesis

The thesis is structured into seven chapters, based on the University of Kwazulu-Natal guidelines for writing a PhD thesis in the college of Humanities.

Chapter One – Background to the study: This chapter provides a general introduction to the study. It includes background information, statement of the problem, research objectives,

research questions, significance of the study, preliminary literature, a brief outline of the theories used to underpin the study and an introduction to research methodology.

Chapter Two - Theoretical framework: Chapter two elucidates various theories used to underpin this study such as: Libqual^{+TM}, modern theories of management, Wilson's 1999 information seeking model among others.

Chapter Three - Literature review: This chapter presents a review of related empirical and theoretical literature in books, journals, conference proceedings, theses, and others on the main themes and variables of the study, as well as gaps in literature and how this research project helps to bridge these.

Chapter Four - Research methodology: Chapter four describes the research paradigm, approaches, research designs, population, sampling procedure, data collection procedure, data analysis, validity/reliability of instruments and ethical considerations.

Chapter Five – Data analysis and presentation of findings: This chapter presents the results of the study. In this chapter, qualitative results are presented thematically, while quantitative results are presented using frequencies, charts, figures, tables and narrations.

Chapter Six – Discussion of the findings: Chapter six discusses and interprets the results of the study using existing literature and the theories that guide the study. The originality and contributions of the study to theory, practice, policy and methodology are adduced.

Chapter Seven – Summary, conclusions and recommendations: This chapter provides the summary, conclusion and recommendations. In addition, it highlights areas for further research.

1.7 Summary

The chapter introduced and presented the current debates within the conceptual setting of the study. The chapter defined SMEs and discussed the role university libraries can play in serving the SMEs with R&I information. The contextual setting of Ugandan University Libraries' R&I information was discussed in the context of their role in promoting business growth of agricultural SMEs in Uganda. The chapter also presented the statement of the problem, research objectives, and research questions. Furthermore, the chapter presented the significance of the study, preliminary literature, a brief introduction of theoretical framework and introduction to research methodology. The proposed structure of the thesis was also outlined.

CHAPTER TWO

THEORETICAL FRAMEWORK

"The essence of science is that it is always willing to abandon a given idea for a better one."
H. L. Mencken

2.1 Introduction

The purpose of this study is to investigate how university libraries in Uganda repackage and disseminate research and innovation information generated in universities to Small and Medium Enterprises (SMEs) for use in their entrepreneurial programmes. This chapter presents the theoretical framework for studying Research and Innovation (R&I) information in university libraries and how it is disseminated to small and medium enterprises. A theory is defined as a body of generalisations and principles developed in association with practice in a field of activity like library and information studies (Burkland 1999:26). Scholars use theories to portray and describe events in their field of studies. This is clearly demonstrated by Creswell (2009:51) that a theory is an "interrelated set of constructs and descriptions of events formed as propositions or hypotheses to specify relationships among variables". In other words, theories help researchers gain deeper understanding or insights in the variables of their study. Welman, Kruger and Mitchell (2005:21) also posit that theory is a set of "statements, definitions and propositions that systematically explain natural phenomenon by specifying relations among variables".

There are several frameworks that can be used to underpin studies on re-engineering of university library's research and innovation information services that include: the scientific management approach, the neo-classical approach, the modern theories of management, SERVIQUAL, Expectation Disconfirmation Theory, LibQUAL+^{TM}, Wilson's 1981, 1996 & 1999 information seeking behaviour models, Ellis's 1989 and 1993's behaviour model of information seeking strategies and Kuhlthau's 1991 model of stages of information seeking behaviour among others.

This chapter is organised in four sections. Section 2.1 briefly introduces the chapter; section 2.2 discusses theories related to the study; 2.3 describes the theoretical framework underpinning the study and section 2.4 is a summary of the chapter.

2.1.1 The Neo Classical Approach

Based on several Hawthorne experiments, Neoclassical theorists recognised the importance of individual or group behaviour and emphasised human social relations. These Neoclassical researchers led by Roethlisberger & Dickson (1943) argued that these considerations were more consequential in determining productivity than mere changes in working conditions. They further asserted that productivity increases with high morale of workers as a result of the personal and intimate attention received from management. This research gave birth to the neoclassical approach which emphasises the following three principles; the individual who is not a mechanical tool but a social being, the work group that operate within a formal organisation and participative management which allows workers to participate in decision making (Food and Agricultural Organisation 2016; Dessler 1985). This approach is focused on workers and is not suitable for this study which investigated other issues beyond workers.

2.1.2 The Scientific Management Approach

The scientific management approach was developed by Taylor, F.W. in (1947). He was a mechanical engineer who set out to scientifically "determine the output of physical tasks" (Carlisle 1982:35). This theory is based on the concept of planning for work such that organisations can be efficient, maintain good standards, specialise and simplify work. Taylor therefore developed four principles of scientific management to improve productivity: Science, not rule-of-thumb, scientific selection of workers, Management and labour cooperation rather than conflict and scientific training of the worker (Food and Agricultural Organisation 2016; Dessler 1985). Since this approach focuses on increasing productivity through mutual trust between management and workers, it is mechanistic, crude, restrictive and ignores major aspects of human nature (Carlisle 1982; Daft 2003:42). It is therefore not applicable to this study which examined both issues of mechanical and human nature.

2.1.3 Ellis's Information Behaviour

David Ellis developed the Behaviour model of Information Seeking Strategies in 1989 where he elaborated the different behaviours involved in information seeking (Ellis 1989). According to him, there are eight features in this theory: an information user begins seeking information by asking a knowledgeable colleague, s/he then chains by following footnotes and citations in a known material, s/he then continues to browse using semi-directed or semi-structured searching, this is followed by differentiating the browsed information using known

differences in information sources through filtering the amount of information obtained. This feature is followed by monitoring where the information seeker keeps up-to-date with current awareness searching, then s/he extracts the information selectively identifying relevant materials from the identified information source. The eighth future is verifying where the user checks for the accuracy of information. Having verified the degree of accuracy of the information, the information seeker comes to the end where s/he concludes the information searching process. Figure 1 presents a description of this theory.

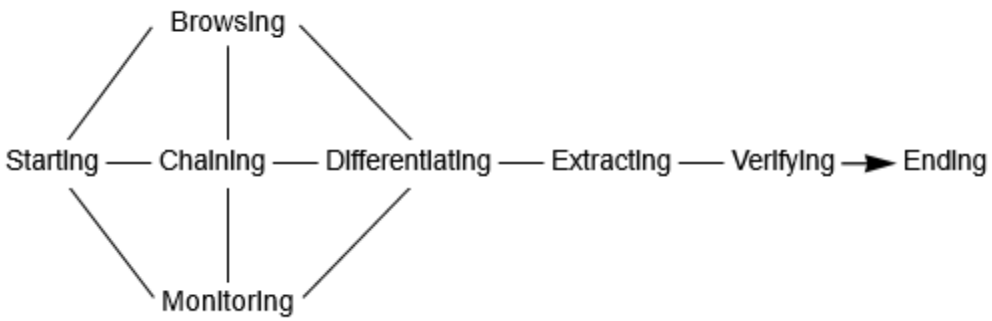


Figure 1: Ellis's Behavioural Framework (Source: Wilson 1999:255)

This model has been widely used by scholars and is recommended most for use when evaluating the use of electronic resources (Thivant 2005; Mishra et al. 2015; Makri et al. 2008). The new trend of information seeking behaviour research specifies that emphasis should not be on the information user but the information the user seeks and uses (Thivant 2005). This therefore entails a closer look at the work situation, activity trends that influence information seeking and use, which this model does not give adequate attention to. Furthermore, though Ellis's model is based on empirical research and has been tested in subsequent studies, scholars have argued that these information seeking behaviours do not necessarily take place in a specific sequence and "may be initiated in different sequences at different times in the overall search process" (Wilson 1999:255). Ellis's theory of information behaviour seems to be nested between the two micro and macro analysis of search behaviour and therefore is not suitable for this study.

2.1.4 Kuhlthau's Information Search Process Model

The Information Search Process (ISP) model was first discovered and developed by Carol C. Kuhlthau in 1985 (Kuhlthau 1991; Kuhlthau 1994; Kuhhlthau et al. 2012). This discovery followed several decades of research on library users' process of learning from a variety of

information sources. This model explains the different stages of the information searching process. It presents seven stages which are: initiation, selection, exploration, formulation, collection, presentation and assessment. Figure 2 is a presentation of this model.

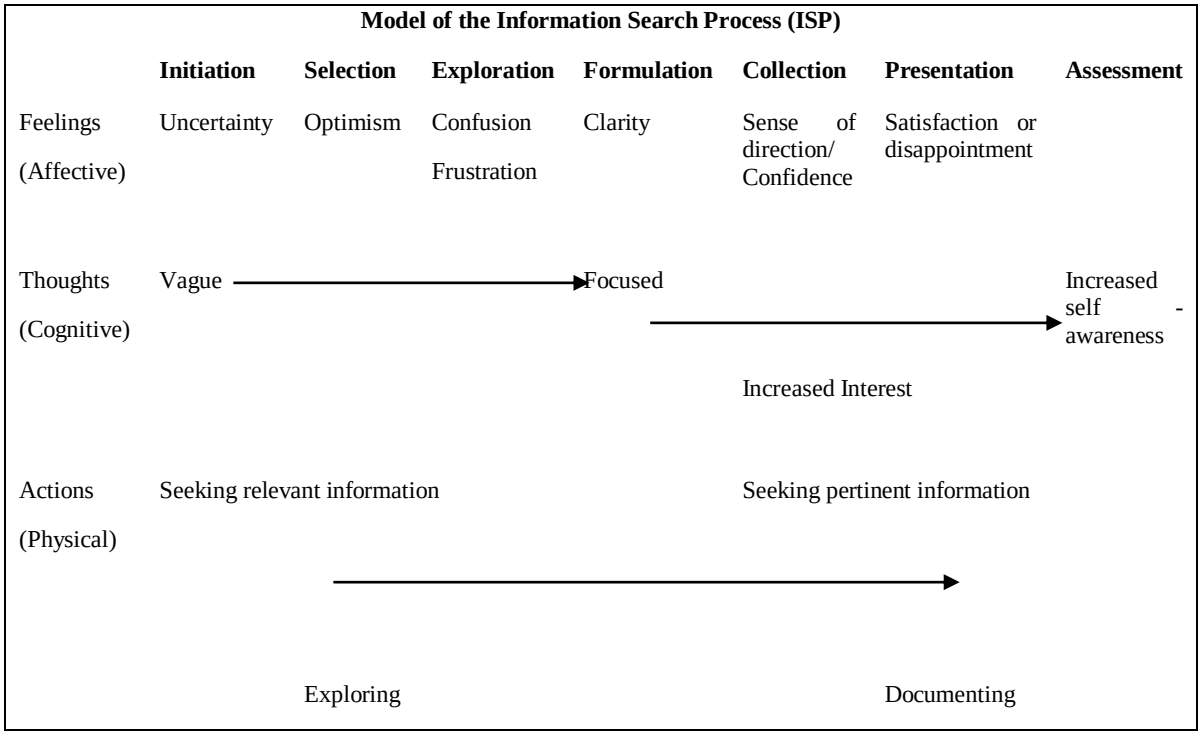


Figure 2: Information Search Process Model (Source: Kuhlthau 2004:82)

As demonstrated in the figure above, the information search process starts with the first initiation stage where a library user seeks basic information to meet an information need. Selection is about identifying an information source to obtain a broader perspective of the basic information obtained. This is followed by exploration where the information seeker reconnoiters on the other aspects of the broader topic identified. It is from there that the information seeker formulates a link between the information need and the identified topics of interest. After linking, the information user gathers the relevant information and uses it in the presentation stage. The information search process is crowned with the assessment stage where the user is either satisfied or dissatisfied with the information searching process.

Moreover, it can be seen from the figure above that the information searching process involves the emotions of the information seeker. The feelings of the information seeker also move in stages from a point of uncertainty, through to optimism and finally to accomplishment. Another dimension is the cognitive which moves from vague to increased awareness. The actions also move from seeking relevant information to pertinent information.

There are a number of studies and scholars that have applied this model (Mishra et al. 2015; Thivant 2005) and found it useful in many research environments. Scholars studied this model and observed that this theory is associated with "feelings, thoughts and actions appropriate to the information seeker's tasks". This association of feelings, thoughts and actions clearly identifies Kuhlthau's model as phenomenological, rather than cognitive and therefore not suited for this study which is more cognitive.

2.1.5 The Expectation Disconfirmation Theory

The Expectation Disconfirmation Theory (EDT) was coined by Olson and Dover (1979) to explain user information technology satisfaction. EDT is a fairly dominant marketing paradigm for studying customer satisfaction from initial technology expectations and comparisons. A number of studies that have applied this model have got varying experiences, both positive and negative. What is common in most studies is that people prefer using human like technologies because people trust people and not technology (Lankton et al. 2014; Berndsen et al. 1996). This theory has been reported to be subjective in post-usage comparison that can result in one thinking performance was better, the same as, or worse than expected, since expectations, disconfirmation, and performance can all affect satisfaction (Lankton & McKnight 2012:89). Disconfirmation is not suitable for this study since it is applicable mostly to information technology settings; and secondly it is too subjective.

2.1.6 SERVQUAL Model

This tool was developed by Parasuraman, Zeithami and Berry (1985) having been grounded in the Gaps model of service quality, and the tool essentially measures customer perception on the quality of service. It measures perception of a library service across five service quality dimensions: "tangibles, reliability, responsiveness, assurance and empathy" (Markless & Streatfield 2013:37). Yu et al (2008) briefly explain the meaning of each of these five service quality dimensions below. Tangibles refer to aspects relating to library equipment, physical facilities, library personnel and communication materials that are measured against the expectation and perception of an ordinal scale. In contrast, Reliability are aspects relating to the capability of a library to perform the promised service accurately and unfailingly. Furthermore, Responsiveness measures willingness of a library to offer appropriate services and help to its patrons and customers. Assurance is the measure of the knowledge and courtesy of library staff and their ability to inspire confidence and trust in

their users as they offer them information services. Finally, Empathy dimension measures the level of care and individual attention a library is in position to offer its users.

SERVIQUAL stems from the "contemporary service quality assessment of customer satisfaction" which scholars have been studying since the 1960s (Miller 2008:3). The numerous studies on approaches to customer satisfaction gave birth to the contemporary conceptual model of service quality (Crosby 1993). As the word suggests, SERVIQUAL is an acronym of Service Quality. Around the 1980s the customer satisfaction measurement movement rebranded into the total quality movement and captured the attention of businesses in Western economies where they recognised a need for a model that addressed the fundamental shift to a service-based, rather than product-based, economy. The focus was no longer on a specific tangible product but on the "customer perceptions of whether their expectations were being met or not" (Crosby 1993:392). The twist of focus from tangible products to user perceptions led to Service-based industries in the private sector to seek an instrument that can measure customer perceptions and this gave birth to SERVQUAL. It was designed as a questionnaire consisting of 22 pairs of statements, with the first half measuring customers' expectations for the quality of a service, and the second half measuring their "perception of the actual quality of the service" (Yu et al. 2008:512).

It is complicated measuring the quality associated with the intangible aspects of services as compared to the tangible characteristics of physical products. Finn and Lamb (1991) evaluated SERVQUAL scales and the results of their study challenged the validity of the SERVQUAL scales as measures of the determinants of perceived quality. Yu et al. (2008:516) further argued that SERVQUAL was largely accepted in the 1990s as a valid assessment tool in libraries; however, with time subsequent research revealed that the SERVQUAL original five dimensions did not entirely tally with the attributes of library service quality. This therefore meant that the primary SERVQUAL statements and the five dimensions needed thorough review. Traditional library assessment methods tended to measure library quality objectively, SERVQUAL on the other hand emphasises on users' subjective judgement. SERVIQUAL is therefore suitable for profit oriented institutional libraries and not university libraries.

2.2 The Theoretical Models Underpinning this Study

As already observed earlier, theory explains how and why the variables are related. It acts as a "bridge between variables" (Creswell 2003:139). Below is a discussion of theories which

were used to underpin this study. The theoretical models are described in the form of visual models or visual statements to explain the representations and relationships between the different variables of the study (Leedy & Ormrod 2005:141). Chigona and Licker (2008) enumerate four key reasons for underpinning a research study to a theory: to make prediction, to systematically define research procedures, empower researchers with explanatory power, and to test and improve the applicability of the theory. It is because of these reasons that the researcher chose the three theories discussed below to guide this study.

2.2.1 Modern Theories of Management

Before the 1950, there were two dominant management theories which were Scientific and Neo-Classical which looked at organisations as structures or mechanisms (Cole 2004). However, at this time, academicians started modifying these two theories where they were viewing organisations as systems. These modifications gave birth to the modern theories of management. There are five popular dimensions of the modern theories of management, but this study used only three dimensions which apply to it directly and these are: the systems approach, Social-technical approach and the Contingency or Situational approach (Hicks & Gullet 1975; Passmore 1988). These three dimensions were chosen because they state that an organisation has to adapt to the changes in the environment it survives in. This speaks directly to this study which looks at how university libraries can help SMEs to survive as avenues of economic development. Pugh (2007:5) posits that libraries all over the world are in a grip of "discontinuous change mainly caused by technological advancement" and these changes demand a distinguishable break with past practices if the libraries are to be successful.

Systems Theory: The first dimension of systems approach was coined by American academicians (Lawrence & Lorsch 1967a) and it is based on the concept that the organisation is a system that is designed and has a structured process in which individuals interact to achieve the objectives of the organisation (Hicks & Gullet 1975). The systems theory further holds that merely describing an object is superficial, therefore one must "understand the relationships that contribute to its existence" (Carlisle 1982:49). In this study, the university library was viewed as an organisation with a system composed of interconnected and mutually dependent sub-systems (Albrecht 1983). This theory uses the big picture approach thereby overcoming the common weakness of viewing things with a narrow perspective. This study therefore employs three basic elements of this approach which are; components, linking

processes and the goals of the university library as the organisation in question (Bakke 1959). Figure 3 is a presentation of this model.

Figure 3: Components of the Systems Approach Model (Source: Food and Agricultural Organisation 2016)

The three parts presented in the figure 3 above are discussed as follows:

***Components*:** Under the element of components, a university library has five basic interdependent parts which work together in order for the library systems to function normally:

- The individuals which are the university library staff members;
- The formal and informal staff relationships in the university library;
- Patterns of behaviour emerging from work demands of the university library;
- Role comprehension of the university library staff members; and
- The physical environment in which library staff work in.

This study investigated how these interdependent parts of the university library can be re-engineered to effectively serve the SMEs with R&I information. The findings are reported in Chapter five.

***Linking processes*:** The different components highlighted above are required to operate in the university library in an organised and correlated manner. The interaction between them is contingent upon the linking processes, which consist of communication, balance and decision making (Food and Agricultural Organisation 2016).

- ***Communication*** is a means for eliciting action, exerting control and effecting coordination to link decision centres in the university library in a composite form. In this study the focus was put on the communication link between the university library R&I units and the SMEs.
- ***Balance*** is the equilibrium a university library has to make between its different parts of the system to keep a harmoniously structured relationship with one another. It should be noted that traditionally, university libraries serve students and staff. Hence in this study, the researcher was keen to understand how best the university can balance the service to students and staff with that of SMEs.
- ***Decision analysis*** is also considered to be a linking process in the systems approach. Decisions to produce R&I information that is usable by SMEs needs to be made by the university library and other university top managers. Decision to produce R&I information may also depend upon the attitude of the library staff members and the demands of the organisation. Decision for SMEs to patronise this information also comes into play at this point. This depends on the benefits the SMEs get from using this information or what they expect to get that can contribute to the success of their enterprises. The decision analysis component was deeply factored in this study.

Goals of organisation: The goals of the university library may be growth of their collections, stability of their operations and a harmonious interaction with their users. Interaction implies how best the members of staff can interact with one another to their mutual advantage as well as with the library clients. In this case, the clients include the students, staff and external users like the SME patrons. This study investigated the extent to which serving SMEs with R&I information can be a key goal to university libraries in Uganda. The reverse was also true, the study also investigated the extent to which university libraries' R&I information can lead SMEs to achieve their key goals like growth, stability and interaction.

Daft (2003:32) posits that a university library system acquires inputs from an "external environment, transforms them in some way and discharges outputs back to the environment". Figure 4 shows the basic systems theory in a university library setting.

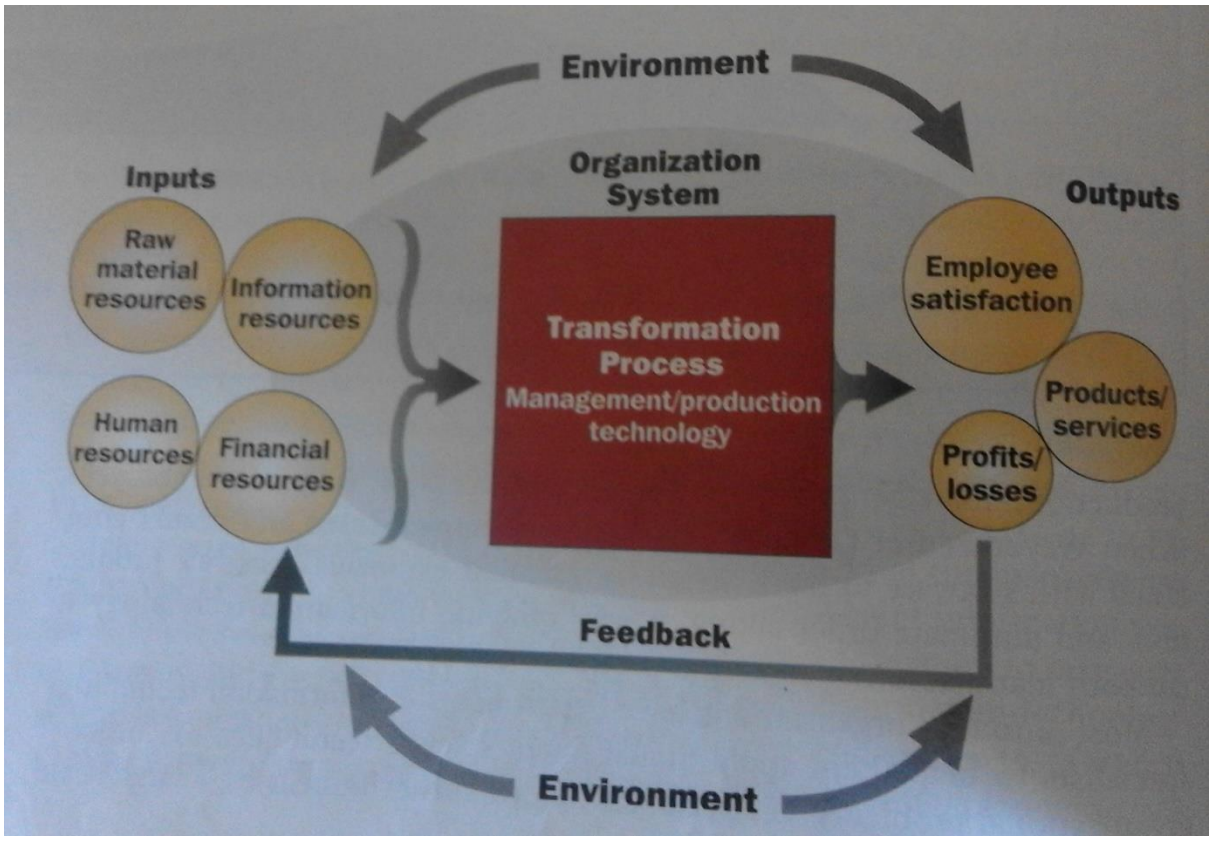


Figure 4: Systems view of Organisations (Source: Daft 2003:32)

As illustrated above, the system's view has five variables: inputs, a transformation process, outputs, feedback and the environment. This study customised these variables into a university library setting as described below;

- Inputs – These are R&I information materials from researchers, which are received by the library to produce goods and services for the SME patrons. More inputs may also mean human resources like experts and well-trained librarians who have technical knowledge in managing R&I information, financial resources, and a sundry of raw materials. All these perspectives were reflected in this study.
- The transformation process is the library management's use of production technology to change the inputs into outputs. This transformation may include the repackaging of

the dissertations and theses into R&I information formats that can easily be patronised by SMEs.

- Outputs – are the R&I information services it offers to students, staff members, external researchers and SMEs.
- Feedback – is the knowledge of results that influence the selection of inputs during the next cycle of the process. The study sought to know whether the library bothers to get feedback from its users to ascertain whether they are getting quality R&I information and how they are using this feedback to determine or improve the research and innovation information they get from the researchers.
- Environment - as already suggested above includes the social, political and economic forces in play in the entire library system.

Since the systems theory looks at the forest rather than the trees, some scholars have criticised it for coming up with abstract solutions to the problems as it does not identify "situational differences and factors" (Carlisle 1982:64). This study therefore applied it together with the situational model which provides more specificity in terms of research variables and relationships within a university library system.

Social-Technical Approach*:* Like in the systems approach, Lawrence and Lorsch (1967b) went ahead to invent the socio-technical approach which looks at transforming the technology of an organisation into a meaningful tool in the hands of the users (users refer to the library workers who handle the R&I information). This approach further asserts that every organisation consists of people, technical system, and the environment (Pasmore 1988). Therefore, librarians who are the people working with the technical system of the library have to use tools, techniques, and knowledge to produce services (R&I Information) valued by consumers or users who include the SMEs. This study applied this approach by including university IT staff members as part of the sampling frame. The study was interested to know how best these university IT staff could design applications that can be used by university libraries to ease access and use of R&I information by SMEs.

Contingency Approach*:* The third approach under the modern theories of management is the situational or contingency approach. It was created by the researchers from Tivistock Institute of Human Relations in London. These researchers were led by Trist and Bamforth (1951). Up to this time, the prevailing management theories evolved by examining

"functions, processes and enumerating principles of management" (Carlisle 1982:50). Scholars have criticised this approach saying that simply knowing principles of management was not enough, the principles had to be connected or related to the situational circumstances under which they become appropriate. They further stated that organisations are not mere structures but they are also made up of people, technology and the environment. This approach is based on the belief that there cannot be "universal guidelines which are suitable for all situations" (Daft 2003:53). Contingency theory has made many "significant contributions to the management thought and practice" which have been widely accepted and this was one of the main motivations of using this theory to underpin the current study (Carlisle 1982:51). University Library systems are therefore inter-related with the environment and require different organisational relationships for optimum effectiveness, taking into consideration various social, legal, political, technical and economic factors (Hellriegel & Slocum 1973). Figure 5 is a view of the contingency approach.

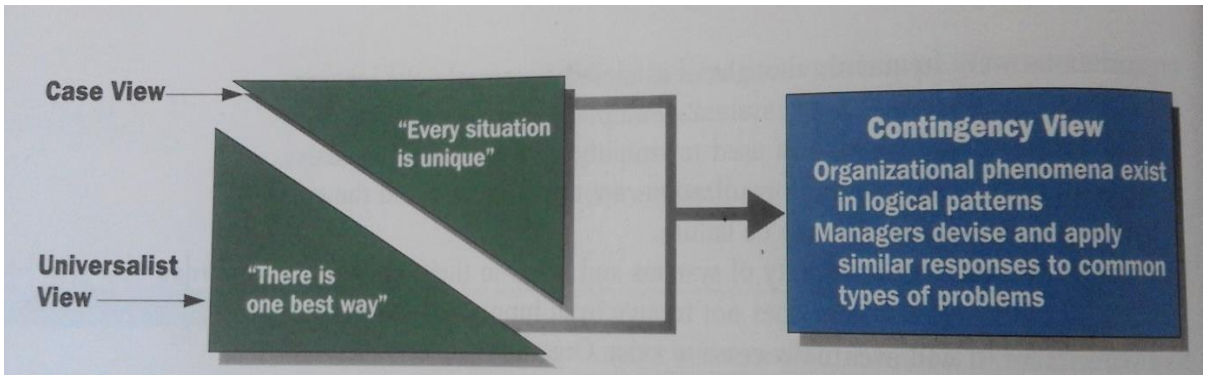


Figure 5: Contingency view of Management (Source: Daft 2003:54)

As illustrated in the Figure 5, the contingency approach asserts that what works in one setting might not work in another. In the case of a university library, the way the library serves students and staff with R&I information might not work for SMEs. It is therefore the work of the university library managers to search for important contingencies that work for SME library clients. Daft (2003:54) further argues that library managers must learn to identify "important patterns and characteristics" of university libraries and then fit solutions to those characteristics.

As pointed out, this study applies the systems theory together with situational theory to classify specific environmental variables mentioned above which most scholars broadly categorise into four types: "goals and values of the library, psychosocial sub systems,

technical structure, and structural subsystem" (Carlisle 1982:65). Figure 6 shows how these variables work together to support the library managerial subsystem.

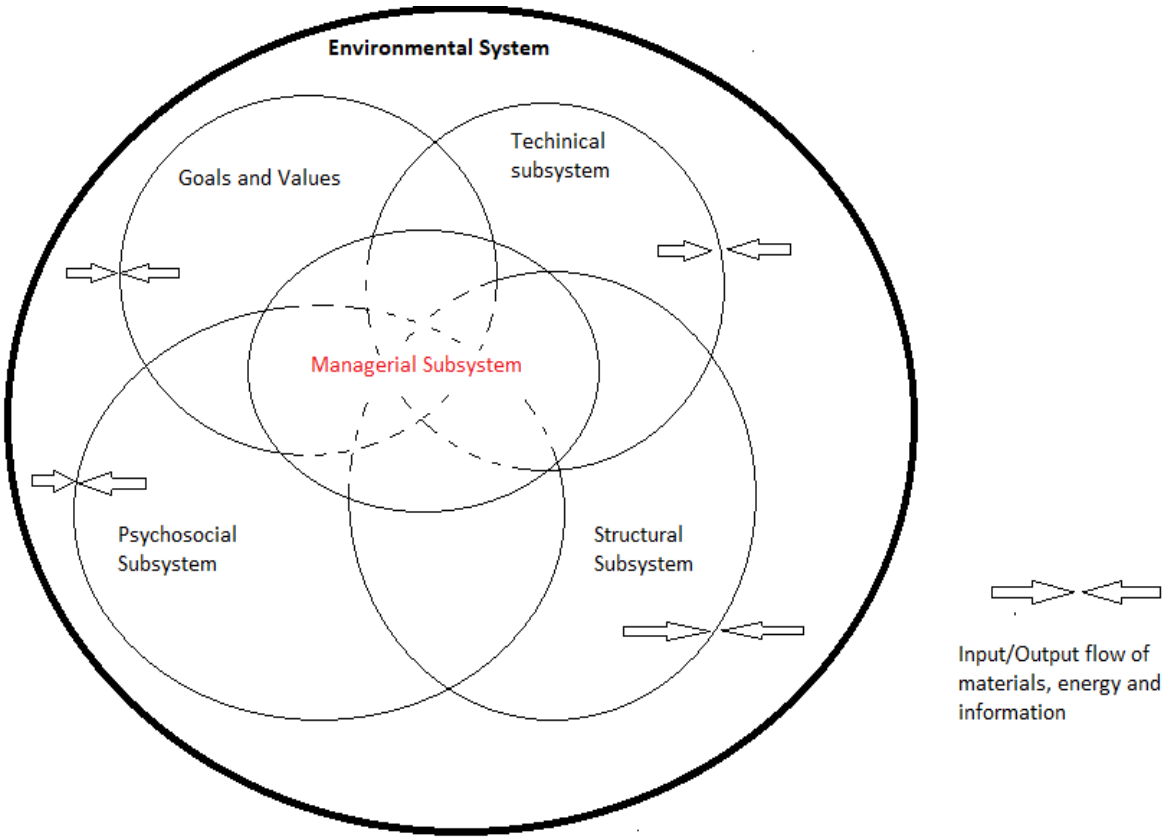


Figure 6: University Library Environmental Subsystems (Source: Carlisle 1982:65)

In this study, the researcher viewed the major subsystems and relationships as factors a library can use to re-engineer its R&I information services for SMEs. The study investigated the psychosocial subsystem which included the library staff members' relationships amongst themselves and the SME users. The staff members are the actors in this whole equation. The goals and values of the university library are already explained under systems theory above. Under the technical subsystem, the researcher studied the tasks, techniques, technology, library workflows, operations of the R&I units. Finally, the organisational structure was investigated right from the top university management and their legal and policy framework, delegation of authority, library budgets, infrastructure, external influences such as the International Federation of Library Associations and Institutions (IFLA), Government of Uganda, Consortium of Uganda University Libraries (CUUL) and Uganda Library and Information Association (ULIA) among others. All these aspects that guided the study and the findings are reported in Chapter five. The modern theories of management were further

used to underpin this study because the three dimensions mentioned above are deeply reflected in the second, fourth and fifth research questions of this study.

2.2.2 Wilson's Model of Information Seeking Behaviour

T. D. Wilson first coined the Information Seeking Behaviour model in 1981 where he stated that a person in context or user remains the focus of the information needs and barriers. The information needs and barriers are represented by 'intervening variables' through which the 'information-seeking behaviour' is identified. This therefore suggests that "the information seeker may be supportive of information use as well as preventive" (Wilson 1999:252). It was interesting to note that though the intention of the model was to reduce the confusion of terminology and concepts of information seeking, the model's content, and the way it was presented, "anticipated, and arguably inspired, many of the newer concerns of information research to the present day" (Bawden 2006:672).

Notwithstanding, scholars have critiqued this model saying that the use of the term 'intervening variables' implied that the impact of information-seeking behaviour is so simplistic and narrow yet it consists of more aspects beyond the user like active searching, information processing, use and feedback among others. This model cannot therefore be used to underpin this study because of the same reasons.

Owing to the several critics, Wilson (1997) did a major revision of his 1981 information seeking behaviour model in 1996. The basic framework of the 1981 model persisted though he drew upon research from a variety of fields other than information science, including decision making, psychology, innovation, health communication and consumer research. Figure 7 is a representation of this model.

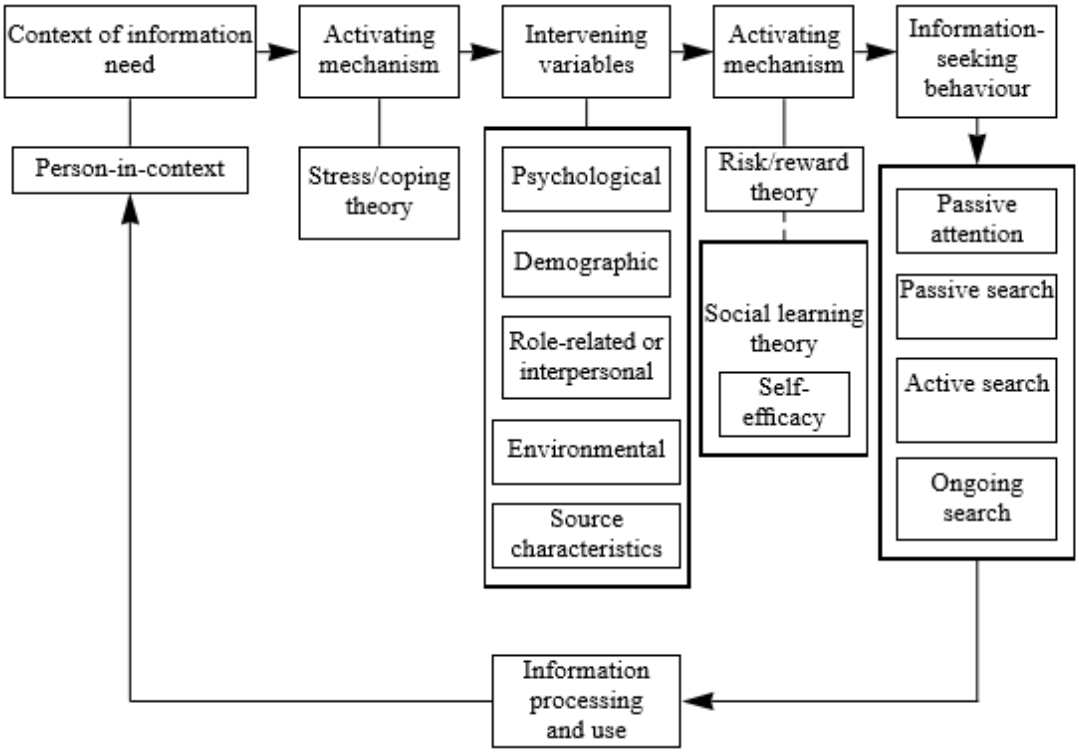


Figure 7: Wilson's 1996 Information Seeking Behaviour Model (Source: Wilson 1999: 257)

As illustrated above, this theory offers possibilities for explaining why some information needs do not invoke any information-seeking behaviour. This helps to clarify which sources of information may be used more than others by a given individual. This is demonstrated by the feedback loop after the information seeker is satisfied with the information received. Since Wilson borrowed concepts from other fields of education, sociology and economics, it broadens the model to have five main variables which are: context of information need, the activating mechanism, intervening variables, information seeking behaviour and information processing and use. As illustrated above, the process of information seeking is sequential (Seyama et al. 2014) because the role that the information seeker plays influences the context, and the surrounding environmental factors of social, political or economic nature (Harland & Bath 2008; Niedźwiedzka 2003).

Wilson (1997) categorises features similar to those described above into two different groups. The first is micro-analysis of search behaviour, which involves starting, chaining, verifying and ending. The second is macro-analysis of information behaviour, which has browsing, monitoring and differentiating features. Though the model is one of the macro-information seeking behaviour following its expansion to include aspects, thus making it richer hypothetically, it has still been criticised that, it does not explore the totality of information

behaviour from the context in which information needs arise to the point where the needs are satisfied either through active searching or otherwise. Therefore, there is need for further research to be done on these aspects. Consequently, this model could not be used to underpin this study.

Owing to the above criticism, it was necessary to do a second revision on this model and this led to Wilson's (1999:251) model of information seeking behaviour theory which focuses on the "user's information-seeking behaviour and the user's information need". This model has five dimensions which are: the user's information need, formal information sources and services, informal information sources and services, information exchange, and lastly information satisfaction or dissatisfaction. The Wilson 1999 model of information seeking is shown in Figure 8 below.

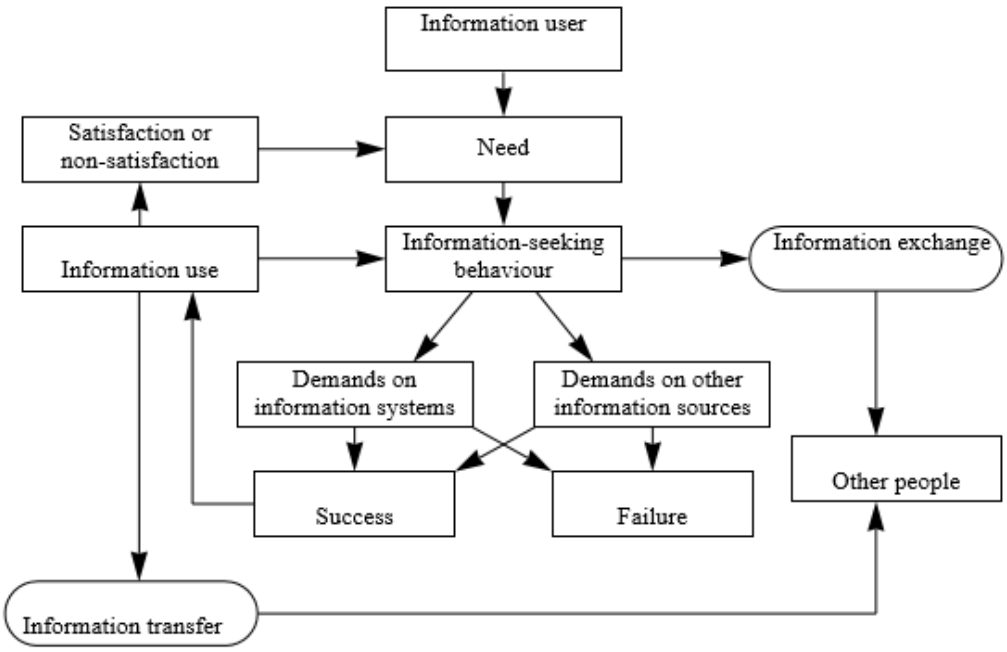


Figure 8: Wilson's 1999 Information Seeking Behaviour Model (Source: Wilson, 1999:251)

As illustrated in Figure 8 above, the user's information seeking behaviour is cyclic, it starts with a user developing a need for information of which s/he makes a demand on an informal or formal source of information. When that source responds, the user will use that information and might be satisfied with it or not. When the user is satisfied with the information, s/he will tend to come for more and the cycle continues, but if s/he is not satisfied then the user may abandon that source. Sometimes the user may get information

from information exchange and transfer sources. The variables of this model are explained below:

The user's information need: Belkin, Oddy & Brooks (1982) define an information need as an inadequacy or a gap in an individual's knowledge. There is a disconnect between university libraries and the new generation of users; the information needs and information seeking behaviours of these new generation users have changed substantially, and consequently the libraries are failing to keep up with these changes (Lippincott 2005). People are driven to seek information to feed and satisfy their information needs as well as solving problems (Mishra et al. 2015). The success of someone meeting their primary need is dependent first on them meeting their information need (Nicholas & Herman 2009).

This therefore qualifies information needs to be basic needs for SMEs. Dorner, Gorman and Calvert (2015:17) argue that it is very important for University Libraries to carry out an "information needs assessment so as to explore and analyse the information needs of their users" like SMEs and thereafter design programmes that effectively connect and meet these needs. SMEs R&I information needs are determined by their level of education, personal interests, availability of personal assistants to help them search for information and their preferred formats. All these dimensions were taken into consideration during this study.
Wilson (1999:841) categorised the process from seeking information to problem solving into four different stages: "problem identification, problem definition, problem resolution and a solution statement". Through these four stages uncertainty can be present until the final stage, but decreases at each stage. However sometimes if the uncertainty persists, it may result in the feedback loop. In this study, the researcher investigated how SMEs seek R&I information to solve their entrepreneurial problems following the four stages highlighted in this theory.

Formal and informal information sources and services: Wilson posits that information needs are primary needs, resulting from three basic types of needs: "affective, cognitive and physical" (Harland & Bath 2008:472). Affective needs of information may be sought verbally from a person or groups of people informally. The cognitive need enhances understanding and may be best from formal sources such as written sources of information like newspapers, patents, brochures, leaflets among others. Physical needs are tangible like a desire for information to produce a tangible innovative solution for a business problem. It should also be noted that technology is changing the information landscape worldwide providing access to a wide variety of electronic information sources such as "on-line bookshops, newspapers,

journals, databases and websites" (Mostert & Ocholla 2005:141). Therefore, distinguishing between the fact that information is a primary need resulting from these three basic needs is important for effective provision of R&I information and this was given a more closer look during the study.

SMEs need to access timely and reliable R&I information available in the university libraries which sometimes is only accessible at a price. From the perspective of librarians in universities as information providers and gatekeepers to their constituents, they can also be observed as "producers, manipulators and communicators of information" (Mostert & Ocholla 2005:137). R&I information can be communicated intentionally or unintentionally to SMEs in the form of: artefacts, sounds, smells, visual and tactile phenomena, events or phenomena depending on the nature of business. By the nature of their work SMEs need to observe their business environment for meaningful decision-making. R&I information can provide the necessary information needed for decision-making. In this study, the university library was considered as one of the formal sources of R&I information for SMEs as suggested in this model. The marketing of this source, library membership, use of technology and related aspects associated with the university library service were also put into perspective during the study.

The other aspect of this dimension is the information format. There has been a raging debate between the print and online resources as to which is the best format for library users. According to Mizrachi's (2015:301) recent study, though library users overwhelmingly preferred print over electronic formats, multiple factors such as "accessibility, cost and complexity of the formats" affected their actual information seeking behaviours. Daniel (2016:100) also concurs with this and adds that "journal articles are the most widely used information resource for research purposes" regardless of discipline. This study looked keenly into these factors and how they applied to SMEs.

Information exchange*:* According to Thivant (2005) information exchange is very predominant in business information seeking situations. Economists and business analysts use different strategies combined with different means, which are personnel, technological and human adapted when exchanging business information. The model shows that information seeking behaviour involves other people in information exchange and that "information perceived as useful may be shared with other people instead of being used by the person" (Seyama et al. 2014:5). Mostert and Ocholla (2005:143) posit that "an

information rich environment provides many alternatives and acts as a reliable and easily accessible information source" for SMEs. However, seeking advice from an oral source can be a time consuming process, especially if it is a source from outside the immediate work environment.

A current trend in university libraries is that of "exploring the impact of research networks" (Wilson, 2016:125). Libraries are creating groups or systems of interconnected people or things and they come in different forms like social networks, computer networks, telecommunication networks and business networks. Like this model purports, networks facilitate information exchange and sharing. According to Wilson (2016), several powerful things can happen in university libraries once they start to make connections and share information among SMEs such as: collaboration, mentorship, peer support, motivation, career advice, sharing of business opportunities among others. All this underlines the specific information seeking and use strategies already described by Wilson's 1999 model, and tested in this study in relation to the SME experience on R&I information.

Information satisfaction or dissatisfaction: The information-seeking process is supposed to stop when the information seeker makes a decision on the information sought primarily to resolve uncertainty. This model suggests that with each passing stage, the information seeker's level of uncertainty reduces as s/he gets information that satisfies his or her information need. An information seeker is successful or satisfied, if s/he can make use of the information found. If the information found fails to satisfy the need, "the person has to reiterate the search process or abandon it" (Seyama et al. 2014:5).

Mishra, Allen & Pearman (2015:669) argue that information is often not used to "resolve uncertainty in decision making but information is often sought and used after the decision is made," just to justify the decision. This may therefore mean that the information seeker is not after satisfying their information need, but rather getting sufficient information to back a certain position. This irony was investigated in relation to how R&I information applies to SMEs.

Scholars have noted that information behaviour research tends to be dominated by inquiry into information needs and seeking, and "less attention has been given to information utilisation" (Mishra et al. 2015:664). However, this study takes care of utilisation as well. A variety of theories and models have been proposed to describe various aspects of information behaviours and there has been a "widespread adoption of some in particular, the family of

models originated by Tom Wilson" (Bawden & Robinson 2009:188). Wilson's 1999 model of Information Seeking Behaviour was therefore used to underpin this study because its four dimensions explained above correlate with the first, third and fifth research questions in this study.

2.2.3 LIBQUAL+™

A number of libraries collect performance statistics which help in informing them about efficiency, but "not many mind about assessing the impact of their library services" (Markless & Streatfield 2013:xi). Systematic feedback on the goodness of a university library comes through surveys such as LibQUAL + ™ (Younger 2010:43). This study therefore employed LibQUAL + ™ to assess the generation, use and impact of R&I information on agricultural academic staff and post graduate students in the Ugandan universities surveyed in this study. It is from these findings that the university library R&I information is assessed and cascaded to SMEs.

The Association of Research Libraries (ARL) in partnership with Texas A&M University coined the LibQUAL + ™ theory as they tried to modify the SERVQUAL tool which was being used to "assess customers' perception on the quality of services" (Kyrillidou 2006:4). It was initiated in 2000 on 13 libraries but by 2006, it had been administered on 298 libraries and "with each administration it kept improving" (Miller 2008:3-4). By 2015 more than 1200 college and university libraries had used LibQUAL+™ from "Africa, Asia, Australia and Europe" (Mkhonta 2016:474). LibQUAL+™ focuses on three dimensions: service affect (the library user's expectations), Information control (Library users' needs) and Library as a place (quality of library services) (Davis & Kyrillidou 2009; Wei et al. 2005). Table 1 shows these dimensions and their corresponding measures of service quality.

Table 1: LibQUAL + ™ Dimensions and Corresponding Measures of Library Service Quality (Source: Miller 2008:4)

/No.	Dimension of theory	Components of measuring service quality
1.	Service Affect	Employees who instil confidence in users
		Giving users individual attention
		Employees who are consistently courteous
		Readiness to respond to users‘ questions
		Employees who have the knowledge to answer user questions
		Employees who deal with users in a caring fashion
		Employees who understand the needs of their users
		Willingness to help users
		Dependability in handling users‘ service problems
2.	Information Control	Making electronic resources accessible from my home or office
		A library Web site enabling me to locate information on my own
		The printed library materials I need for my work
		The electronic information resources I need
		Modern equipment that lets me easily access needed information
		Easy-to-use access tools that allow me to find things on my own
		Making information easily accessible for independent use
		Print and/or electronic journal collections I require for my work
3.	Library as Place	Library space that inspires study and learning
		Quiet space for individual activities
		A comfortable and inviting location
		A getaway for study, learning or research
		Community space for group learning and group study

As illustrated in the table 3 above, LibQUAL+™ was designed to focus on the three dimensions of service affect, information control and library as a place. University libraries are operating in a very competitive environment where their budgets are being cut and every expenditure has to be justified with visible accountability (Shorb & Driscoll 2004). This has forced libraries to conduct effective and practical processes to evaluate and compare their research and innovation information services. A case in point refers to the members of the Association of Research Libraries who require over “3 billion US Dollars to satisfy the library and information needs of the research constituencies” in North America (Kyrillidou & Young 2002:5). Figure 9 presents a description of how this model works in improving service quality.

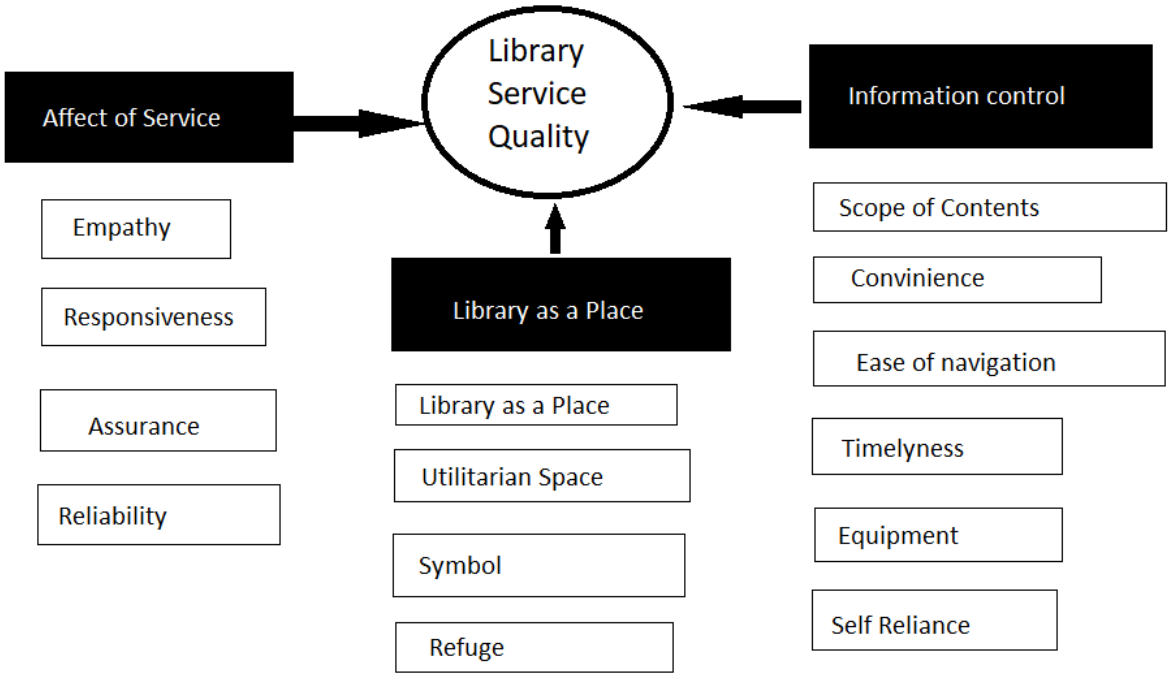


Figure 9: Diagrammatical description of LibQUAL + ™ (Source:Thompson 2004)

Above is a detailed description of the three dimensions in Figure 9.

Service affect: University Library users' key expectations are empathy, responsiveness, assurance and reliability of the information they access from the library. If university libraries are to continually receive patrons in their spaces, they have to ensure that they meet these expectations. This study applied this phenomenon on SMEs' expectations and tested how true or how applicable it was to SMEs.

Under service affect, library users elaborate the details of their concerns. Users feel the need to be constructive in their criticisms and offer specific suggestions for action. A number of university libraries have used this model to assess their library services and it has helped them to improve the quality of services they offer to their users (Hiller 2004; Shedlock & Walton 2004; Thompson & Cook 2002; Wilson 2004; Begay et al. 2004; Wei et al. 2005). According to Shedlock and Walton (2004:99) North Western University's Galter Health Sciences Library "used LibQUAL+™ in two consecutive years and the results provided useful information". The first year results offered a useful and hopeful benchmark, while the second year results provided a wakeup call to explore in depth what users want and need from the library. LibQUAL+™ helped them to measure the effects of their Strategic Plan, recognising the need to evaluate library programmes and services, linking quantitative statistics to qualitative measures and getting user feedback. In this study, some of these

aspects were investigated guided by this model and useful feedback was obtained with regard to how university libraries can serve SMEs.

Information control*:* According to the LibQUAL model, the information control dimension stipulates that library users need the scope of content that is satisfactory, with convenient information retrieval systems, easy to navigate, offering timely response, functional equipment and allowing self-service. When it comes to SME proprietors, some of whom might be semi-illiterate, all these factors count immensely if they are to benefit from the R&I information provided by university libraries. This study certainly explored all these perspectives under information control.

Unlike the North Western University, the University of Washington has participated in the "LibQUAL+™ surveys conducted each year since 2000" (Hiller 2004:121). This university which is located in Seattle, Washington, supports the teaching, learning, and research needs of its academic community of over 4,000 academic and research staff members and over 10,000 graduate and professional students. From their long experience with LibQUAL+™, they have found it to be a reasonably robust assessment tool, less costly, standardised, which easily helps them to identify service gaps, annually helps them to track user satisfaction and needs and can be used to compare results with peer university libraries. The aspect of being standardised and the data collected thereof being easily comparable with other participating libraries was noted by a number of researchers (Lee 2004; Wilson 2004). At the University of Florida Library, on top of the standardisation and comparisons, LibQUAL+™ provided additional benefits like "saving time of developing their own tools and most importantly used it for strategic planning" (Shorb & Driscoll 2004:175). In this study, the same approach was used, the data generated from the tools derived from LibQUAL+™ was comparable among the university libraries involved in the study.

Library as a place: University libraries in developing countries struggle to offer a utilitarian space for their users. This is a big challenge considering the big enrollment numbers *vis a vis* the available library space. However, this dimension is crucial because as long as the library space supports practical learning, then SMEs can use university library spaces as a refuge and symbol of studying and reflecting new novelties and innovations for their business away from the noisy and busy places. This was also critically studied during the investigation in this study.

The need to foster the idea of 'library as place' for the SMEs as distant library users who may not regularly visit the physical library was very important in this study. Such a scenario immediately dictates the need for: document delivery for remote users, the promotion of awareness of services among distant SME library users, an outreach librarian, the use of same standards in the quality of library services for near and distant users, the need for specific training for library staff supporting distant users among others (Tury et al. 2015). This study incorporated all this during its investigation.

In spite of popularity of LibQUAL+™ all over the world, some scholars have criticised this model for having extremely complicated tools. Library users sometimes find the LibQUAL + ™ tools "cumbersome, vague with redundant questions, and also generates complicated data to interpret by library managers" (Wei et al. 2005:94; Peterson et al. 2004). For the tool to be effective, it requires a one-week intensive training of the participants which is sometimes very expensive. To others it ends up raising more questions than answers. However, librarians have come up with initiatives of translating LibQUAL+™ into more easier and understandable modes for users (Association of Research Libraries 2004). This study therefore identified those complicated aspects during the pilot phase and modified them into easier and understandable questions, measurement values and assessment modes.

From the above observations, LIBQUAL+™ was used to underpin the study. Its three dimensions tabulated above are directly encapsulated in first, third and fifth research questions of this study. The researcher followed these three dimensions of LibQUAL+™ to measure the perceptions of respondents on information on R&I. Furthermore, LibQUAL+™ was used to measure the library staff competency and helpfulness and the adequacy of this information in meeting the information needs of SMEs. Finally, the library as place dimension addressed the university libraries research and innovation units' functionality and organisation (Thompson et al. 2006).

2.3 Summary

The three theories: the modern theories of management, Wilson's 1999 Information Seeking Behaviour Model, and LibQUAL + ™ were used to underpin this study. Table 2 is a mapping of research questions to the three theories underpinning the study.

Table 2: Mapping research questions to variables of the theories underpinning the study

Research Questions	Theories	Dimensions of theories
1. What R&I information sources and services are provided by university libraries to SMEs in the agricultural sector in Uganda?	LibQUAL+ TM	Service Affect, Information control
	Wilson's 1999 model of Information Seeking Behaviour	User's Information Need, Formal and Informal Information Sources and Services, Information Exchange
2. How is R&I information sources and services reengineered and disseminated to SMEs in the agricultural sector in Uganda by university libraries?	LibQUAL+ TM	Service Affect, Information control
	Modern theories of Management	Systems Approach, Social – Techno Approach, Contingency/ Situational Approach
3. What skills and competencies are needed by SMEs in the agricultural sector in Uganda to effectively access and use R&I sources and information services?	Wilson's 1999 model of Information Seeking Behaviour	User's Information Need, Formal and Informal Information Sources and Services, Information Exchange
4. What factors and perceptions influence access, adequacy and utilisation of R&I information sources and services by SMEs in the agricultural sector in Uganda?	Libqual +TM	Library as a place
	Wilson's 1999 model of Information Seeking Behaviour	Formal and Informal Information Sources of information, Services, Information Exchange Satisfaction/ Dissatisfaction of User's Information Need
5.What challenges are faced by university libraries in Uganda in providing R&I information sources and services to SMEs in the agricultural sector in Uganda?	LibQUAL+ TM	Service Affect and Library as a place
	Modern theories of Management	Systems approach, Social – techno approach, Contingency/ Situational approach
	Wilson's 1999 model of Information Seeking Behaviour	Formal and Informal Information Sources, Satisfaction/ Dissatisfaction of User's Information Need

Having discussed these theories, data was collected and tested. In Chapter five and six, the researcher reflects on these theories to confirm or disconfirm the results of the study.

CHAPTER THREE

LITERATURE REVIEW

"*The thinker must think for truth and not for fame*"

William Edward Burghardt Du Bois

3.1 Introduction

Literature review is a "summary of what has already been researched and written on a particular research topic" (Chilisa & Preece 2005:60). It is a "thoughtful and insightful discussion of literature that builds a logical framework" into the research topic (Marshall & Rossman 2011:77). Kumar (2005:30) describes literature review as an "integral part of the entire research process" and it comes in many shapes and sizes. Traditionally it involves systematically "identifying, locating and analysing documents" with information relating to the research problem of the study (Robson 2011:51). All this is done to locate the research and identify its originality in that field of study (Clough & Nutbrown 2008:104).

Reviewing literature is based on the assumption that "knowledge accumulates, and that people learn from and build on what others have already done" (Neuman 2011:96). The literature is reviewed by scholars with various objectives derived from the research they wish to conduct. According to Chilisa and Preece (2005:60) the key purposes of doing a literature review in a research study are: "to avoid duplication of what has already been done; to acknowledge the strengths and weaknesses of previous studies; to legitimise a researcher's assumptions; to create a theoretical base for analysing research findings and establishing research gaps". Marshall and Rossman (2011:78) agree with these five key purposes of literature review, but also add on another purpose of demonstrating that the "researcher is knowledgeable about the research topic s/he is handling". Other purposes include providing a "benchmark for comparing the results with other studies, relating the study in question to other larger studies", identifying the ongoing debates and dialogue in that specific field of study and extending the scope of previous studies (Creswell 2009:25).

Some scholars view literature review as a synthesis that represents a "broad scientific approach to a set of research objectives" (Onwuegbuzie, Leech & Collins 2011:187). It's a synthesis that utilises a grounded theory approach to the collection of knowledge on the research topic. The synthesis further generates new ways of looking at subjects and theories (Easterby-Smith et al. 2008:30). Creswell (2003:29-30) and Bryman (2011:81) point out that

literature is reviewed so as to be able to engage in a "scholarly review based on the reading and understanding of other studies in the same field". Having understood other studies in the same field, through literature review, the researcher can contribute to the body of knowledge in that specific field (Easterby-Smith et al. 2008:30).

The purpose of this study was to investigate how university libraries in Uganda can repackage R&I information and disseminate it to SMEs. The study broadly focused on two objectives which were: To investigate how university libraries in Uganda were facilitating access to R&I information for use by SMEs in the agricultural sector and to find out the extent to which university libraries in Uganda repackage R&I information for use by these agricultural SMEs. The following research questions were addressed: (i) What R&I information sources and services are provided by university libraries to SMEs in the agricultural sector in Uganda? (ii) How can R&I information sources and services be re-engineered and disseminated to SMEs in the agricultural sector by university libraries? (iii) What skills and competencies are needed by SMEs in the agricultural sector to effectively access and use R&I sources and information services? (iv) What factors and perceptions influence access and utilisation of R&I information sources and services by SMEs in the agricultural sector? (v) What challenges are faced by university libraries in providing R&I information sources and services to SMEs in the agricultural sector?

This chapter presents the empirical and theoretical literature reviewed for the study. The reviewed literature was sourced from text books, journal articles, newspapers, databases and thesis related to the research topic. The structure of this chapter and themes discussed are categorised into nine sections reflecting the objectives, research questions, and research gap of the study. Section 3.1 introduces the chapter; section 3.2 gives an overview and purpose of literature review; section 3.3 explains the management of Research and Innovation (R&I) information in university libraries; section 3.4 discusses perspectives of re-engineering R&I information services in university libraries; section 3.5 provides an overview on the access and utilisation of R&I information by SMEs; section 3.6 describes the factors and perceptions that influence innovation in SMEs; section 3.7 elaborates the challenges faced in the provision of R&I information to SMEs; section 3.8 highlights the research gap in the literature reviewed and section 3.9 provides a summary of the literature.

3.2 Management of R&I Information in University Libraries

There are three main type of libraries: "public, academic and special" (Walsh 2011:112). These libraries are distinguished by the kind of patrons they serve, though all the patrons come to these libraries seeking for information. The public library serves the general public from the senior citizens to the young children. Special libraries serve institutions and their subject coverage is specialised to the business and specific information needs of that institution. The academic libraries cover a far ranging spectrum including "school, college and university libraries" (Walsh 2011:114). These Libraries are more attached to universities and associated with research centres, polytechnics, colleges of education and other similar institutions of higher learning (Sawahel 2017). The major function of any university library is to support learning, teaching, and research activities of its parent institution and the 'surrounding community' (Sritharan et al. 2016:71). This study therefore focuses on university libraries which is a sub category of academic libraries. Pugh (2007:48) underlines a number of principles that can enable university libraries to be innovative both in the short and long term that include:

- Environmentally sensitive;
- Cultivating an open system and committed to change;
- Understanding that change involves a social process;
- Creating common values and shared objectives;
- Administrative competence in business information support services;
- Reliance on learning as a fundamental foundation for change;
- Axiomatic questioning of the status quo; and
- Creative organisational design (Pugh 2007:48).

Practically applying these principles can greatly propel Ugandan university libraries to amicably re-engineer their R&I information services for SMEs. Historically, university libraries have always provided support and given assistance to researchers. The provision of this research support goes a long way in strengthening and improving the services of the community (Calvo & Simón 2016:107). Research and Innovation information generally refers to information collected and managed in university libraries that transforms ideas into new and improved information products, services or processes, in order to enhance enterprises to advance, compete and differentiate themselves successfully in their marketplaces (Nair et al. 2015).

There is an emerging trend of "assessing a university by the quality of research it generates" (Zeegers & Barron 2010:108). However, these assessments have sparked a debate where scholars query the fact that only quality research attracts public funding and yet it is intrinsic to higher education. Similarly, they question the narrowness of the assessment criteria which is largely based on the citation metrics. These tensions have automatically involved the university libraries which are expected to give the research works the widest possible dissemination and yet the publishers have to maximise their profits by availing this information to only those who can afford it.

The vested interests of the librarians *vis a vis* the scholars and publishers led to the invention of the institutional repository with the aim of creating new dynamic partnerships which remove barriers to accessing R&I information (Brindley 2006). Zeegers and Baron (2010:111) posit that "using libraries as primary repositories for R&I information is a clear indicator of a university library of the future". Technology is required to allow fast and ready access to this information. However, caution should be taken to guard against the rapid changing technology that can easily render the institutional repositories obsolete, hence technology becoming a hindrance instead of an enabler of information access. This study investigated the preparedness of university libraries with regard to the management of R&I information.

While studying how university libraries manage R&I information, it is critical to understand that there are differences and similarities in how "public and private university libraries conduct their business" (Abram 2013:18). They share similarities like employing human staff, both adapt to changes in the environment and both endeavour to satisfy their customers. On the other hand, they have differing value systems. For example private university libraries value maintaining a competitive advantage; apply innovation as a key to long term existence; strive to increase their market share; maximise revenues, take risks and focus mostly on results (Abram 2013). This is in contrast to public university libraries which value collaboration; take good service as a key to their long term existence; emphasise on serving the citizen and consider it as a social contract; are influenced by political and government agendas; "are funded by taxes and public funds, avoid risks and are motivated by making a positive impact in society" (Abram 2013:207). Therefore, this study investigated the application of these different value systems in Ugandan university libraries.

In many university campuses in the developing world, there is no coordination among differing research centres and individual researchers. In such scenarios, the library becomes the "meeting point for interdisciplinary research" (Noe & MacEwan 2010:112). This study further investigated the extent to which university libraries in Uganda have positioned themselves as centres of interdisciplinary research at their university campuses.

3.2.1 University Libraries R&I Information Sources

One of the main functions of university libraries is to manage "huge amounts of information and knowledge created through research" (Allan 2010:8). Academic staff together with their graduate students are the most involved in research. They sometimes work independently or partner with other higher educational institutions around the world. This research may be funded by the university, government, private company and even a private individual. The findings of these research activities are always submitted for publication in formal reports, journal articles, and book chapters. Allan (2010:9) makes an important observation that "academic writing in a journal article is often rather abstract and difficult to read" more so when it comes to lay people like SME proprietors and workers. Sometimes the research findings have to be simplified and rewritten in a more accessible manner such as articles in magazines, newspapers and textbooks for lay people to benefit from them. But even this simplification may still be difficult for semi-literate or illiterate people who may be interested in accessing and using this information.

University libraries are attempting to employ modern and high-speed technologically driven information sources and services to serve their clientele (Ping 2012; Ercegovac 1997). It was noted in the literature that scores of library users find difficulties in accessing library information sources and services due to a number of impediments like lack of training, digital illiteracy, concerns over internet security, low interest in the library sources and services, and a perceived lack of relevancy of such tools for scholarly work (Lawton 2016; Popoola 2008; Ugah 2008). Dewey (2010:1) argues that with the advent of the information explosion, "university libraries should be bothered with managing abundance rather than scarcity of information resources". There were also peculiar cases where clients used library tools, but for informal scholarly communication (Lawton 2016; Ugah 2008; Popoola 2008). This study investigated these limitations in the context of SMEs.

Librarians are therefore best placed to assist users in orientating them to the specific library issues such as discussing copyright implications, Open Access education, and offering guidance with packaging content for different venues and audiences (Reed, McFarland & Croft 2016). This study inspected skills of the librarians working in the R&I library units to ascertain the levels to which they comply with the skills mentioned above.

3.2.2 University Libraries R&I Information Services

It has become critically clear that library and information services provide essential support for "lifelong learning, independent decision-making and cultural development" for all (Župan 2012:215). There are now numerous changes in the way university libraries organise information and how users seek and gain access to it: stemming from "traditional information services to modern ones" (Ercegovac 1997:35). University libraries' vast collections and variety of media offer guidance and learning opportunities to students, staff and their external community. Library and information services further help people improve their reading habits, information literacy, public awareness, training, educational and social skills which are indispensable in an information society. R&I information services are also highly beneficial for sustained participation in democracy and sustainable community development. Duren (2012:43) argues that nowadays "university libraries need to be ahead of other information service providers by knowing their users' needs and wishes" to provide quality services.

Knowing user needs entails carrying out user needs assessment studies. Today there are more innovative ways of conducting these studies where the focus is on the perceptions and attitudes of the library users as opposed to the traditional values like size of the library, quality of collection, and number of patrons served (Kayongo & Jones 2006). One of the popular ways of doing this is by carrying out a LibQUAL^{+TM} library assessment exercise. The assessment measures performance of university library services in three dimensions: "technological support, physical space, and customer service skills of staff" (Roy et al. 2012:154). A number of university libraries around the world have carried out this assessment to evaluate the quality of their library information services. This evaluation helps the library to resolve users' expectations based on their feedback or comments. Through this assessment, better library services "are provided if the nature and needs of users are known" (Asemi, Kazempour & Rizi, 2010:569).

Another way for libraries to be ahead of other information service providers is by offering special R&I information services like documentation, reference service, bibliographical services, indexing and abstracting services, information gathering on funding opportunities, "business newsletter collection, conducting periodical business training sessions, sophisticated search, and retrieval database services" and internet services among others (Madge 2012:86; Ercegovac 1997).

Making R&I information more accessible to SME patrons with visual impairment is of concern. According to Arant and Mosley (2000:4) such R&I information in print can be repackaged from "print to audio enhancement packages and even to braille". There is not much literature on this subject, therefore this study took a keen interest on the viability of SMEs for people with disability and how they access R&I information. Currently in Uganda, attempts of repackaging information are done for specific interest groups. For example Makerere university library, through the Uganda Health Information Digest, repackages scholarly information in print format for health workers who cannot access the information online (International Federation of Library and Information Associations and Institutions 2016). The web has become an interesting multimedia environment integrating text, sound and video formats that can be accessed by different categories of users with disability. According to Lily and Fleet (2000:7-8) university libraries can re-engineer their websites with screen readers for those with total visual impairment, text magnifiers for those with low vision, sound enhancement and sub titling for those with hearing impairment, remote access for those with mobility impairment and simple screen displays for those with learning disabilities. This study sought to understand whether university library R&I web sources are integrated with assistive technologies which ease access to information for the different categories of people with disabilities.

This study also sought to understand how librarians can effectively manage SME expectations especially with regard to access to the R&I information while not forgetting the "marketing of R&I information of excellent quality" (Julien et al. 2013:175).

3.2.3 University libraries' Dissemination of R&I Information

The university library is well placed to play an important role in scholarly scientific research and information creation and dissemination. According to Chiware (2010:397) the amount of R&I "information generation in Africa is still very low". Moreover, most African scholars

shy away from publishing in local journals because of their lack of visibility. Islam and Akter (2013:4) argue that the most crucial problem for libraries of universities and research organisations of developing countries is the "lack of access to the current literature since important research output is most often published in journals with high subscription fees". These libraries have low capacity of acquiring the required journals, and the research infrastructure, as well as the capacity to absorb scientific and technical knowledge is weak. All this leads to low levels of disseminating scientific research output, consequently leading to under-development.

In addition, in most developing countries the infrastructure needed to "disseminate research findings in university libraries is generally weak" (Markless & Streatfield 2013:218). This is mainly because the university managers have not prioritised library infrastructural development because they lack knowledge of about research findings worth disseminating. A few who try to disseminate this R&I information also find problems with the consumers of this information who fail to interpret it and therefore cannot further apply it in their businesses.

The University of Michigan Library, identifies stakeholders and design strategies to work with them. They do a lot of marketing of their R&I services and "tailor them to fit the needs of the community of users" (Chichewicz 2001:40). This approach is however challenging because it needs a lot of collaboration and communication. Lee and Boyle (2009:127) advise that as soon as the R&I information products are delivered to the library, "the stakeholders should be notified quickly". Getting people to patronise the resources immediately triggers feedback which is essential for future planning. Through emails, training workshops, newsletters, and flyers among others, awareness can be created. According to Hart, Coleman and Yu (2000:49) Library services of Texas A&M University were marketed by placing flyers on "campus mail, promoting new information products in newsletters, engaging their users in meetings, suggesting resources to users and scheduling library tours".

In Sub-Saharan Africa, a number of university libraries are embracing the open source movement for the supply of dissemination of R&I information. Malawian university libraries have been reported to have embraced this movement and they offer open access to their e-journals, online databases such as HINARI, EBSCO host, AGORA and many others (Rosenberg 2005; Malemia 2014). Similarly, at Sokoine National University of Agriculture Library in Tanzania, unlimited access to electronic resources is offered. They further host

institutional repositories of international organisations like Oxford University, JSTOR, SAGE and others. With the help of Libhub, a Resource Management System (RMS), internal and external library users can "search and discover several information resources from different databases simultaneously" (Jabir & Katabalwa 2016:388).

According to Abram (2013:211), the creation and unearthing of hidden R&I information is largely owing to the social technologies and digital content. This study investigated how the Ugandan university libraries could use the social web to increase access to R&I information. The study further explored the use of the popular dissemination strategies mentioned above and the perception of SMEs to these modes of disseminating R&I information.

3.2.4 Agricultural Research in Uganda and Beyond

There is literature on how specific fields like "engineers, lawyers, scientists among others access information in the developed world but such initiatives are very few in Africa" (Wema 2013:180). Many higher learning institutions in Kenya are trying to use social media to drive academic research through "generation, conversing, sharing ideas and modification of research information with the help of institutional repositories" (Nyamasege & Musakali 2014:165). With a combination of good business models, social media can facilitate an increase in the consumption of R&I information by agricultural SMEs. This study tested the viability of this strategy in Ugandan agricultural SMEs.

Research is one of the essential missions of universities and through research universities are able to achieve three key things according to Fulano (2014:264): research helps universities to "avoid old fashioned and monotonous teaching with new inventions, provides special services to the immediate university community, and contributes to the country's economic growth and development". While much of the international agricultural research and innovation is easily accessible, the one in Africa is generally not visible, therefore hardly accessible. Chisenga (2012:132) therefore advises that building "institutional and national repositories accessed online is one pathway of easing the access" to R&I information by SMEs. Most Sub-Saharan African countries are agricultural based economies and university libraries have a mandate of storing and disseminating information on high yielding, as well as disease and drought resistant varieties (Abioye, Zaid & Egberongbe 2011).

Mukiibi (2016:154) asserts that in Uganda, agricultural research is undertaken by "academic institutions, profit and non-profit organisations" coordinated by the Uganda National Councils of Science and Technology (UNCST). The National Agricultural Research

Organisation (NARO), a public institution created by an act of parliament, is at the apex of agricultural research in Uganda. It collaborates with universities and other local and international agencies engaging in agricultural research. This study investigated the extent to which Ugandan universities and NARO collaborate and how they support SMEs with the agricultural research generated.

According to Mgalama (2014:297), since time immemorial, "the sharing and use of agricultural research between the research institutions and the farmers has been on-going". Sometimes it is done inform of extension services or advisory services in developing countries where innovations developed in research institutions are transferred to farmers. In Uganda, the National Agricultural Advisory Service (NAADS) was created in 2001 to engage farmers in critical thinking, as well as manage agriculture as a business in order to increase productivity and profitability (Odoi 2018). Though the participation of households in NAADS programmes has increased, there is no clear evidence of increased or "improved use of agricultural innovation" (Mgalama 2014:301). Elsewhere in Botswana, extension and advisory services are deployed by the Ministry of Agriculture and they widely use ICTs to disseminate R&I information to farmers (Ntokwane & Mosweu 2016). This model has focused farmers involved in subsistence farming. There is therefore need to investigate an approach that transfers R&I information to agricultural SMEs, hence this study.

Hall and Nahdy (1999) posit that, as much as farmer participatory research (FPR) methods have been advocated as a means of increasing the transfer of R&I agricultural information, they have largely failed. The interrelationship between the actors have remained complex and the institutions generating R&I agricultural information are incompatible with users of the information. Hall and Nahdy (1999) therefore advise that attention needs to be focused on the real impact of these methods and the receptiveness of the institutional settings of the R&I agricultural information. This study partly addresses the above mentioned because it investigates the plausibility of developing a policy to address these challenges, streamlining the structures of agricultural research, as well as creating flexibility in the university library systems for agricultural SMEs among others. University agricultural research is harnessed properly in Uganda, and can be a powerful stimulus for economic growth by creating jobs, generating new ideas and innovations (Fulano 2014:265).

Through the first research question on which the theme of the management of R&I information in university libraries was based, the study investigated R&I information sources

and services provided by university libraries, its marketing and dissemination to SMEs, and the plight of agricultural research in the agricultural sector in Uganda.

3.3 Re-engineering University Libraries R&I Information Services

From Mossop's (2013:xvii) long career in academic librarianship, he learnt that "change is relative and it means different things to different librarians". He noted that some staff members "seek for it, others avoid it, others welcome it, others resist it, others initiate it and others ironically scarcely realise that it is happening". Re-engineering changes in library services provokes a lot of heightened passions and emotional responses among stakeholders, yet all university libraries undergo changes from time to time. Library managers are constantly reflecting on how best to adjust the direction and momentum of their library services to optimally meet the needs of their users (Brindley 2010). Traditional styles of library management may therefore not suffice with the current challenges facing university libraries; instead, library managers need to pioneer radical innovation in different areas such as managing R&I information.

According to Pugh (2007:10) changing a library service starts "before the gestation period of a specific project and requires taking a proactive view to change" such as:

- Identifying developments in the internal and external environments of the library that would require a response;
- Bringing talents to bear on identified problems and opportunities in the library;
- Equipping all library staff with required skills;
- Ensuring free and supportive learning and professional development;
- Sharing and delegating of authority and responsibility;
- Establishing robust and comprehensive systems of communication; and
- Embedding a culture of change and flexible organisational structures (Pugh 2007:10).

If the above strategies are in place, the university library will not find it complicated creating new mind sets among library staff, and the leadership will have refined concepts of motivating and developing coping mechanisms to the new changes like serving SMEs with R&I information.

More and more innovative university libraries are moving their dominant culture away from a "full time educational model towards a more flexible pattern that supports group dialogue, harnessing citizens and community creativity" within the library spaces (Brindley 2010:viii).

This adjustments are sometimes called "realignment, re-focusing, redirection, but it is ever fundamental and radical" because it seeks to improve the service and consequently demands changing deep seated organisational cultures, which might be dramatic and disturbing to some individual staff members (Mossop 2013:xix).

For university librarians to successfully re-engineer their libraries, they need to demonstrate a capacity to recognise the need for change and devise innovative strategies to enable that change to occur (McGuire & Hutchings 2007). The gist of re-engineering is breaking away from old ways of doing things to new and radical ways that "bring improvements in terms of quality, service, customer response and cost reduction" (Kwanya 2016:65). This essentially starts with identifying the drivers or triggers for this change including both external (Government laws, regulations, globalisation, technological advancement) and internal ones (human resources, skills expansion, administrative structures).

Mossop (2013:45) adequately discusses "library staff resistance to change" and how it can be addressed. Implementing change requires changing the mind sets of library staff, instilling confidence in the change strategy, selling the vision and creating a robust inclusive change message. Managers sometimes go an extra mile and take the staff resisting the change into a process of denial, resistance, exploration and commitment as they approach the change scenario.

University libraries can encourage innovation and entrepreneurialism given that most of their staff members are "by nature inquisitive, well-educated, and gifted in their own right with the required skills" (Mossop 2013:69). This innovation and entrepreneurialism can be made accessible to diverse users using variety of tools such as digitisation equipment, RSS feeds, blogs, wikis, instant messaging, Podcast, and Vidcast (Harinarayana & Raju 2010; Hoffman 2016; Martinez 2016; Chiware 2010). Despite these efforts to enhance access, most university libraries have not addressed the needs of SMEs especially with regard to how research generated at the universities can carefully be repackaged for their use (Aikaeli 2007; Chiware, 2010).

3.3.1 Re-engineering University Library Spaces for SMEs

Re-engineering university library spaces for SMEs may prove to be a complex task for library managers more so in a developing country like Uganda. Many university librarians "will never or only have one opportunity to plan a new library building" (McDonald 2010:32). Therefore, this means that the experience and capacity of managing such projects among

librarians is very limited. Nonetheless, library space is such an expensive resource and should be planned strategically. It therefore ought to get maximum attention from the university administrators because well planned library spaces contribute to the university missions as well as the developmental plans of the nation.

Re-engineering library spaces to effectively support R&I information services for SMEs will involve vision, strategy, communication, leadership, negotiation management, creativity and project management associated risks (McDonald 2010). The library managers should relate with many professionals to develop an inclusive approach that embraces creativity, responsiveness and flexibility. All this is needed when it comes to influencing the culture of a university that has a positive attitude towards serving SMEs. The focus is normally on designing exciting spaces that enhance research, learning and innovation. An ideal library space for SMEs should be "functional, efficient, interactive, compliant with technology, adaptable, conducive, accessible, environmentally suitable, varied, safe and secure" (McDonald 2010:36-37).

As pointed out earlier, sometimes staff may resist change and demonstrate irrational feelings towards the changes in the university library spaces. During such situations the library managers should be ready to be bold, diplomatic, understanding, trouble shooters, crisis managers, negotiators and ready to collaborate and compromise. However, caution should be exercised to persist on required designs and "not compromise with positions where the library as a whole has interests" (McDonald 2010:34).

3.3.2 Re-engineering University Library Technologies for SMEs

Library users' interests and expectations are increasingly dependent on technology (Neal & Jaggars 2010:55). University libraries therefore strive to customise and personalise their information services to fit within the personal interests and styles of their users. Their investment on computer technology increasingly enhances their services (Markless & Streatfield 2013:6). The University of Minnesota Library is currently re-engineering their technology as an affordable means to reach their external community members. They use webinars and personal training which have enabled them "to keep in touch with their external community in the midst of severe library budget cuts" (Mastel 2011:212).

Information communication technologies have become the heart of research as technology is "innately embedded in the whole research process right from inception through storage" (Bossaller & Atiso 2015:27). Technology has further led to openness of information access,

self-service with minimal intervention of librarians. Today's trending library technologies include: Web 2.0, mobile technologies, web applications, cloud computing, institutional repositories, digital networks among others. A modern university library has to be compliant with all these technological developments if it is to remain vibrant and visible. Actually Miller (2011:96) observed that setting up shop in the virtual world was the "clearest way for information professionals providing the best possible service in the digital age".

Furthermore, statistics have shown that mobile technology is surpassing internet and television preference (Coyne 2010:110). Library users now want to access the library using their mobile gadgets like smart phones, tablets, personal digital assistants (PDAs), MP3 players, tablets, kindles, iPods, notebooks and other mobile devices from anywhere around the world. Mobile technologies can ease access to a wide range of library R&I information services. They can be used to facilitate functions previously done by computers such as "web browsing, audio recording, video recording, texting, emailing, video showing, gaming and social networking" among others (Kapondera & Ngalande 2016:165).

Among all mobile devices, De Saulles (2012:88) reports that smartphones have had the "highest penetration of 84% out of every 100 people around the world". Therefore, university libraries can send SMS in the form of reminders, alerts, and any other R&I information notice to the smart phones of their SME patrons. Walsh (2012:4) reports of a study that was carried out to assess the attitudes of library users towards library text messaging and the results indicated that it was 'overwhelmingly positive'. The study revealed that library patrons were happy with library messages that are promotional and not potentially intrusive.

Cloud computing is another emerging technology that is trending in many university libraries; it bases "the computerised library processes on a widely distributed environment" (Coyne 2010:112). This has led to libraries submitting their information utilities like Machine Readable Catalogue (MARC) records to a big shared database like the Online Catalogue of the Library of Congress (OCLC). This has both advantages and disadvantages when it comes to R&I Information. Cloud computing reduces the load of work of cataloguing if libraries have related bibliographic information; however, the opposite is true if each library has its own unique R&I information. Cloud computing also facilitates backing up a university library R&I information off site. In case of a disaster, "there would be a recovery plan" (De Saulles 2012:53). Table 3 is a summary of the benefits and costs of re-engineering the university libraries technologies derived from the literature reviewed that library managers

have to bear in mind as they plan to take this course of action. ***Table 3: The benefits and costs of re-engineering University Library technologies (Source: De Saulles 2012)***

S/No.	Benefits	Costs
1	Access to the latest R&I electronic resources	Paying expensive charges for the e-resources
2	No overdue library fees on e-books	Fluctuations in exchange rate of licences for the e-books
3	Easy access to the free e-books and e - resources	Re skilling library staff and users to acquire skills of accessing and marketing the free e-book databases
4	Easy knowledge sharing through the Open Access movement	Resistance to change and misinterpretation of copyright vs open access
5	Remote access to Library resources even off campus	Threat of plagiarism
6	Sponsorship of initial IT library project from developmental partners	Sustenance of donor funded IT library projects
7	Ever decreasing costs of IT equipment over time	Obsoleting of IT equipment over time

In view of the benefits and costs of re-engineering library technologies, this study investigated the extent to which university libraries can adopt technologies that are convenient and that will promote high participation of users and less involvement of staff.

Universities and institutions of higher learning have long been the primary producers of "original research that has led to many world changing innovations" (De Saulles 2012:41). Traditionally, the universities have been disseminating this research information through peer reviewed journals; however, the trend is shifting to Institutional Repositories (IR). Heery and Powell (2006) define an institutional repository as a university library online platform that manages and disseminates digital materials created by the university and its community members. This platform allows a wide range of information mateirals like working papers, videos, original data sets, lecture notes, journal articles, conference presentations, audio files, pictures, books and book chapters. The IRs are indexed by search engines like Google Scholar, and are therefore searchable around the world.

Caution should be taken while re-engineering university library technologies because according to a study on SMEs in Namibia by Rufaro, Chiware and Dick (2008:145), the findings revealed that there is "a very low level of ICTs utilisation among SMEs, while among business support organisations it is relatively high". This means that university libraries have to balance the re-engineering of technology such that the suppliers and users of

the R&I information can comfortably use the technology, while disseminating and accessing respectively.

3.3.3 Re-engineering University Library Web 2.0

Web 2.0 technologies are enabling university libraries to respond to the "globalised communication trend, connect with their patrons, and maintain a strong web presence" (Landis 2010:v). Technologies that are collaborative and interactive are leading libraries to use modern approaches like gaming tools in the library. According to Bolorizadeh and Smith (2010:121) Web 2.0 technologies perfectly compliment university libraries and are very "beneficial when creating virtual environments" such as;

- Creating content through podcasts, vodcasts, wikis, blogs,
- Patron interaction through blogs, wikis,
- Engaging knowledge communities through Facebook, Myspace, Ning,
- Collaboration through Google docs and wave soon among others.

University libraries for instance are using Flickr to upload historical and educative photos for their clients. They are further using YouTube to upload educative video content for their users. Through this strategy, content is indexed by search engines like Google, Yahoo and therefore making it discoverable and this can be proved by the high number of views they get (Kroski 2009). This kind of participatory environment allows sharing and reusing R&I information on the network platforms. University libraries can use these platforms to update their users with "news and events on the various social networking sites" (Neal & Jaggars 2010:62). University Libraries can therefore re-engineer their library services in a number of ways using Web 2.0 technologies.

A blog is a library website with content arranged "in the order it was created where the latest posts appear first" (De Saulles 2012:14). Blogs allow posting R&I information in its simplicity even without the knowledge of the Hyper Text Machine Language (HTML). Though blogs have been criticised as platforms for egoist lonely individuals, they are being used by established entities for posting their expert opinions. Blogs therefore can be embraced by university librarians to post their expert opinion on research and innovation for entrepreneurs and business enterprises. Other libraries create library blog videos of two to four minutes where they share "brief highlights of events happening in the library" (Robinson 2010:44).

Other emerging Web 2.0 technologies include wikis, podcasts, vodcasts, QR Codes, Jing, Scoop it, Linkedin, Facebook, and Myspace among others. These are collaborative platforms where groups of people can post and share information. Some are flexible where users are allowed to "add, delete and edit content posted on them", while others are controlled by their administrators (De Saulles 2012:23). This flexibility is sometimes questioned because it creates an anarchic collection of disorganised information. This is however controlled by requesting to first register and permission from an administrator before executing anything on the social media site. University libraries can create such sites for SMEs to share research and innovation information amongst themselves. In this respect, Pressley (2010:1) posits that "web 2.0 technologies can be very helpful in creating live reference sources and community collaboration spaces" for SMEs.

The challenge with Web 2.0 technology is that it is dependent on whether the library users will download and install them on their devices. If they do not, then the library will not be able to deliver since the users' devices will not have the required applications to connect with the library. Unfortunately in some African university libraries, according to Banda, Balulwami and Zulu (2014:155), utilisation of this technology is still low and is restricted by the "IT department due to bandwidth inadequacy". Landis (2010:20) advises that it can be very helpful for these university libraries, to design social media policies to guide "the creation and management of content and other issues related to Web 2.0 technologies". It is also in this policy that the library can address user behaviour and adoption.

3.3.4 Re-engineering University Library Staff for SMEs

Re-engineering R&I information services for SMEs cannot be successful without a long term strategy that develops university library staff members with a positive attitude towards meeting the needs of SMEs. This strategy needs to develop a calibre of staff who have interest in collaborating with SMEs, providing specialised research assistance to them and even going an extra mile in offering convenient and user-friendly R&I services to those outside the library. Pugh (2007:15) posits that this calibre of staff should possess skills in "information management, networking, collaboration, coaching, flexibility, teamwork, motivational use and exploitation of ICT, negotiation, knowledge harvesting and integrity". All this will call for library staff with characteristics of an embedded librarian.

Shumaker and Talley (2009:9) define an embedded librarian as one who "focuses on the needs of a specific group of library users, builds relationships with them, understands their

work and thereafter customises specialised information services to meet their specific information needs". This certainly involves high levels of collaboration. Some SME users may prefer to access the R&I information in a variety of ways so the embedded librarian should be curious and interested to know those unique preferences of the users and thereafter come up with "innovative ways to provide the R&I information resources that match the user preferences" (Brower 2011:13).

In addition to the above, Shumaker (2011) argues that embedded librarians should be marketers of the R&I information, instructors, service evaluators, synthesisers and summarisers of R&I information, negotiators and should have the ability to manipulate R&I content on the web, intranet and other social networking sites.

Similarly, University Library staff members can be re-engineered to provide "extension reference support and document archiving" (Mastel 2011:217). An extension library staff can be deployed to offer reference assistance in person to SMEs on phone, via chat and email. There could be scenarios where a remote user may not have access to a phone or internet. In such a case, Meola and Stomont (2000:26) suggest new collaborative softwares that can serve remote users in real time such as "paging, instant messaging, application sharing, audio and video conferencing". University library staff need to be very creative and explore all these avenues that can be used to reach SMEs. For example at the University of Minnesota Library, Mastel (2011:217) created videos from her "virtual chat sessions, designed posters, digital poster repository" whose collections became popular and expanded to the level of being recognised at the national level.

The demand of transforming University Libraries cannot be met without involving the professional development of library staff. According to Markless & Streatfield (2013:12) this is a "burgeoning demand call for ICT skills training for library staff to work in e-information environments". University libraries in Uganda therefore have a huge task of developing their staff to reach this calibre if they are to efficiently serve SMEs. This study explored the plausibility of university libraries using social media tools in attracting SMEs to their R&I information collections.

3.3.5 Re-engineering University Library Partnerships

The University library is becoming like the "crossroads of the scholarly community" (Noe & MacEwan 2010:103). While it connects people to places, resources and institutions, others get connections from there to collaborate and thereafter work. Therefore, libraries have to

create an environment where they, together with their users, create and initiate formal and informal partnerships at different organisational levels for SMEs. Efforts should further be put in place for the created partnerships to be maintained through effective communication, strong organisational structures, shared mutual visions and missions (Noe & MacEwan 2010).

A vibrant and re-engineered university library partnership programme has to participate and engage in national, regional and international activities. Such activities are aimed at benchmarking international library standards as well as "exposing library staff to new international practices in the library" (Chiware 2010:400). There are quite a number of international organisations and bodies that Ugandan university libraries can partner with and these include: the International Federation of Library Associations (IFLA); the Commonwealth Library Association (COMLA); and the International Association of Technological University Libraries (IATUL). At regional level, there are organisations like Standing Conference of African National and University Librarians (SCANUL), the Standing Conference for Eastern, Central and Southern African Libraries (SCECSAL), and the Association of African Universities (AAU). Nationally there is the Consortium of the Uganda University Libraries (CUUL), and Uganda Library and Information Association (ULIA). Partnering with all these organisations provides a platform for technological university libraries to share information and collaborate on a number of activities. From the literature reviewed, it was generally observed that the idea of University libraries supporting SMEs with R&I is still a remote idea; however, it can be embraced because IFLA is advocating for libraries to re-engineer themselves and become strategic partners of government in development.

According to Kinengyere (2007:329) Ugandan university libraries are "partnering with one another through the creation of a Library consortium". According to Kinengyere, the term "library consortium" refers to an association of libraries that enables systematic and effective co-ordination of resources all for the library user. The main driving goal of creating these consortiums is to address the issue of sustainability of e-resources. The Consortium of the Uganda University Libraries (CUUL) was therefore set up in August 2010 for this reason. The areas of cooperation in CUUL include sharing of skills, information materials, human resources development, interlibrary loan services and co-operative marketing of libraries.

An immediate example is where Ugandan Universities jointly subscribe to the Libhub Resource Management System through CUUL. Libhub allows library users within the university campus and without to search and discover electronic resources simultaneously from different databases. Originally users had to use numerous passwords to search from individual databases at a go which was very cumbersome. In Tanzania, Sokoine University of Agriculture library staff partnered with Mzumbe University to build capacity of their technical skills in digitisation and e-resources management (Jabir & Katabalwa 2016).

There is therefore need for consortia strategic partnerships in this aspect of university libraries serving SMEs with R&I information. It can cause "chaos working without any policy" because researchers deposit their works in any repository and it would cause a lot of fatigue for users to search for these works (Neal 2010:17). Strategic partnerships should also provide for collaboration among university libraries and share these resources instead of duplicating the same services. This study investigated the prospects of having such a consortia strategic partnership policy for R&I information in place.

3.3.6 Re-engineering University Library Outreach Services

It is common knowledge that the University Library's key users are the university students and staff members both academic and non-academic. However, their mandate extends slightly more where the university libraries are expected to serve researchers and external users. Musoke (2008:532) posits that most university libraries extend their services to users outside the university community as many of these libraries also serve as "national referrals in certain subject areas as well as legal deposit libraries". Therefore, it is on this premise that they can re-engineer their services such that instead of waiting for those outside users to come for the specific information, the university libraries can instead identify where those users are and take the information to them through the university outreach programmes.

Arant and Mosley (2000:1) defined university library outreach as "an act of the library to extend its services and benefits to a wider section of the population". This involves communicating a particular message to an audience in order to gain their support. In this case, the University library should be in position to bring R&I information out of the library to SMEs in their own environments. Alternatively, university libraries can create an ambience in the library that is welcoming and user-friendly. This definitely calls for developing proactive services for the SME patrons that would make them aware of the existence of such

R&I information services, building mutually beneficial relationships between the librarians and the SME patrons.

Elsewhere university outreach programmes are also known as community engagement and there are in diverse and in most cases there is less or no funding involved. University libraries can utilise the few available resources to aid the communities around them. In South Africa, university libraries give ICT donations, books, free training sessions, equipment like chairs and tables to members of the community outside the university campuses (Bangani et al. 2016). This does not only apply to public university libraries. In Kenya, Kabarak University Library responded to the information needs of the children in the community and created a children's section in a university library. This made the library popular in the community and it used it as a strategy of creating a "good relationship between the university and the community" (Kinyanjui 2010:99). In the same vein, both public and private university libraries in Uganda have available R&I information that will take the libraries to go out and train SMEs on how to access and utilise its information services for their entrepreneur growth and sustainable community development.

Clearly, there is more than enough evidence to show the small and medium business community's need from the university library information services. These needs may start from: planning and providing for R&I information to tender seekers who normally come to the library; taking advantage of interest in business workshops at the library; sending out notifications to local business owners to come and patronise the available R&I information; creating and marketing R&I library programmes on social media and through the library newsletter; going outside the library and into the community to meet the business owners, professionals and job seekers and building sustainable meaningful connections and relationships with them (Alvarez 2017).

Musoke (2007:532) argues that the world is experiencing dynamic changes all the time and therefore university libraries need to be "innovative, network and collaborate" as they try to meet the never ending demands and needs of their users. Through the literature reviewed above, this can be done through re-engineering their university library outreach services. Through the second research question, this study assessed how University libraries in Uganda re-engineer R&I information, library spaces, technology, staff members, partnerships and outreach programmes for SMEs.

3.4 Access and Utilisation of R&I Information by SMEs

Several studies in Africa have shown that SMEs have diverse R&I information needs like: how to enhance business growth, how to start up small businesses, licensing, tendering, taxation and tariffs, increasing productivity, sales, marketing, export trade, training opportunities, credit, potential investment opportunities, market trends, new products, viable business projects, supplier prices and customers (Mutula & Brakel 2007; Okello-Obura et al. 2007; Rufaro et al. 2008). According to Blackwell et al. (2006:3536) and Mutambi, Byaruhanga, Trojer, and Buhwezi, (2010:208), SMEs particularly those in the agricultural sector, need information that would enable them "make better-informed and more reliable decisions".

Agricultural R&I information is accessed and utilised by SMEs through a number of ways. The traditional ways have been through agricultural extension agents, agricultural shows, one on one contacts, print and electronic media. According to Fulano (2016:253) the "radio transcends all other forms of communication" and it plays an important role in creating awareness for new R&I information. Even Ntokwane and Mosweu (2016:269) concur with the above because in their study, it was reported that the "radio was the most widely used tool" in accessing R&I agricultural information. These radio programmes are sponsored by different organisations like the Ministries of Agriculture, Non-Governmental organisations, farmer associations and sometimes private businesses and individuals. Fulano (2016:260) reports the different ways this R&I information is utilised which include: "crop rotation, timely planting, shift cultivation, irrigation, applying organic fertilizers, use of improved seeds, soil conservation, diseases and pest control and use of animal manure". It was further reported that whenever they apply the R&I information, they would experience higher yields, reduced hunger and poverty.

In a related study in Uganda, SMEs showed a marked preference for radio stations as a trusted source of business information. It was however observed that for this R&I information to qualify to be utilisable, radio stations needed to repackage it for the different specialised SMEs. In addition, "newspapers were also considered as key sources of business information" (Okello-Obura et al. 2008:21). Some of the popular Ugandan newspaper pull-outs with quality R&I information include: Pakasa, Yiiya sente, Gold seeds among others. It was however discouraging to note that in Obura's study, SMEs did not show much enthusiasm for "library and internet-based sources" (Okello-Obura et al. 2008:22). This study

therefore investigated what changes needed to be made to create or increase the enthusiasm in SMEs for the university library and its web-based R&I information. In other words, this study investigated how university libraries can re-engineer their information services in respect to radio broadcasting.

In spite of their low enthusiasm, a number of scholars have noted that SMEs lack an information function in their enterprises and they normally rely on "public libraries or business links for that function" (Donnelly & Craddock 2007:45). They often complain that they have difficulties in finding necessary information. Other scholars attest that public libraries are completely underutilised mainly because the market for business information is small and overcrowded with suppliers of free information, resistance to pay for business information, lack of information awareness, and problems with the usage of business services. Unfortunately this happens in most African countries, where public libraries are supposed to provide ready access to a range of business information resources, instead "they have not been adequately used for this function" (Rufaro et al. 2008:147). This study explored the possibilities of using university libraries alongside public libraries as avenues for disseminating R&I information and help demystify the misconception that libraries are purely for educational and recreational purposes.

Kazoora et al. (2006:15) assert that SMEs in Uganda are often "under-represented in national planning and decision-making processes for poverty eradication". Lloyd (2010:82) further posits that SMEs are often under equipped in key information skills such as "ability to evaluate information found on the internet". More concerns have been expressed on how business executives and workers lack information to make "critical business decisions" (De Saulles 2007; Lloyd 2010:82; Economist Intelligence Unit 2007). In some medium enterprises, the managers make a conscious effort to keep R&I information accessible only to the top executives (Lombard 2010:23).

There are however some few initiatives being done to bridge the gap between the researchers and the farmers. According to Kaddu and Haumba (2016:244) the Communication and Information Technology for Agriculture and Rural Development (CITARD), a community based organisation, "is stepping in to share information on best agro practices and marketing". It identifies researchers and institutions committed to uplifting the rural masses, accesses their R&I information and later disseminate it to farmers in Butaleja District in Eastern Uganda. This is a good initiative of re-engineering R&I information though it geared

towards rural farmers. It remains to be established whether there are similar civil society organisations doing the same for Agricultural SMEs.

These rural SMEs are always willing to not only receive the R&I information but also utilise it, but are mainly curtailed by funding. However it was reported by Nair and Kloeppinger-Todd (2006:21) that the Development Finance Company of Uganda (DFCU) has strongly come out to help agricultural rural SMEs to finance SMEs' procurement of machinery like; 'vehicles, tractors and milling equipment', among others. This intervention is done through providing them with finance leases, charging interest rates similar to those offered by banks, but requiring less collateral and offering longer and flexible payment periods. This study was interested in investigating whether agricultural SMEs are aware of this opportunity and if they have taken advantage of it to utilise the R&I information access.

3.4.1 Skills and Competencies Needed by SMEs to Access and Use R&I Information

We are currently living in an information age, mere access to R&I information is not enough. SMEs need skills and competencies of analysing information, as well as obtain "accurate and legitimate information from what is commonly called the information explosion" (Lombard 2010:1). The needed skills and competencies are four components: identification, location, analysis and use. The R&I information seeker must be able to identify a goal or topic, be able to locate the resources where to find that information either with the help of library finding tools or the librarians themselves. After locating the information seeker should be able to analyse the resources through evaluating the relevancy and quality of those R&I information resources. Finally having ascertained that the information is good for consumption the SME information seeker has to apply that R&I information in his or her enterprise to improve their business operations (Lombard 2010:5-7). This study investigated the possession of these skills particularly the four components among agricultural SMEs in Uganda.

University libraries are always faced with a challenge of transforming from "a print based information service to a more interactive, integrated and web based information service" to be more relevant in meeting the information needs of their users (Jordan 2001:68). Since the working environment is always changing, the library is expected to address the critical skills of their staff members and ensure that they comply with the constant changes in the information world. Conceptually, this starts with addressing the critical thinking and information literacy skills of the academic librarians in charge of the R&I library units. Depending on the availability of funds, university libraries sponsor their academic librarians

in charge of R&I units to polish their skills in "critical thinking, information literacy, together with the general leadership and management skills" which ultimately develop the librarian's professional confidence while serving SMEs (Jordan 2001:68). This study explored the possession of these skills among librarians working in the R&I units of the university libraries.

Horton et al. (2010:380) assert that it is necessary to strengthen the capacity of agricultural SME employees and enable them to innovate through the "development of knowledge, attitudes, skills and social capital". For this reason, re-engineering R&I for use by SMEs should be accompanied by capacity building. Abram (2013:208) further advises that information professionals who work in environments that support "special needs of work teams, business and institutions should focus on creating longitudinal relationships that help them achieve the goals of their enterprises". For example, one essential goal could be to meet the SMEs' needs to innovate new business strategies for their enterprises. The University library has therefore to provide a space where SMEs can be supported with quality R&I information for "business decision making" (Abram 2013:221).

3.4.2 Information Literacy Programmes for SMEs

The internet is offering huge amounts of information to library users. These huge amounts include current and out-dated information, disinformation, and misinformation. A SME library user has to possess adequate information literacy (IL) skills to be able to identify and select "authoritative, reliable, and dependable information" that they can use for their entrepreneurial programmes (Markless & Streatfield 2013:5). Ugandan university libraries are slowly realising the importance of IL programmes as a way to "ensure maximum utilisation of their very costly e-resources" (Kinengyere 2007:330). Since access does not necessarily mean usability, IL strategies are laid down to ensure that available resources are maximally utilised.

According to Lloyd (2010:26), information literacy is the ability of a library user to possess skills of "knowledge of where the information is in a library environment, understanding how to search for it and thereafter authenticating and critically evaluating the information obtained after searching". Increasingly the concept of information literacy is taken out of the educational context into the workplace. This change puts emphasis on skills and attitudes associated with the ability to "manage and share information in an organisation" (Hepworth & Walton 2013:3). This approach was examined at three Canadian universities and it was

found that this intervention was "breeding positive results" (Hepworth & Walton 2013:7). IL is most realised when collaborative relationships between the librarians and SMEs are frequent, strong and persistent. The impact of IL can be measured by how it improves "professional skills in the workplace" and encourages "informed citizenry and governance in a democratic society" (Lawal et al. 2013:153).

The proficiencies needed by librarians who conduct the instruction services for SMEs need skills such as "administrative assessment and evaluation, curriculum knowledge, communication, information literacy integration, leadership, instructional design, planning, promotion, presentation, teaching and subject expertise skills" (Noe 2013:94). It has been observed that IL for SMEs is far different from that of students and academic staff members due to a number of reasons such as "difference in the work environment, difference in time constraints, pressures and terminologies used" (Donnelly & Craddock 2007:47; Lloyd 2010:xv).

Through the theme of access and utilisation of R&I information by SMEs derived from the third research question, this study reviewed the above literature to investigate: how SMEs in the agricultural sector in Uganda are accessing and using R&I information; the suitability of the alternative sources of R&I information by the SMEs; skills and competencies needed by SMEs in the agricultural sector to effectively use R&I information sources and services; how university libraries can design an IL programme for a business environment like SMEs; how SMEs utilise this information; and possibilities of how university libraries can partner with these alternative sources of R&I information to disseminate the R&I information in their collections.

3.5 Factors and Perceptions that Influence Innovation in SMEs

Innovation is defined as a new way of thinking, generating ideas and coping with the changes in the environment (Jarrat 1999). If Agricultural SMEs are to remain competitive in the market, they must continue innovating, making their presence very visible, responding pro-actively to the demands of their customers; all this may not be possible without the support of a reliable source of R&I information. Aikaeli (2007:17) decries inadequate innovation among SMEs in Tanzania where homogenous kinds of SMEs are mushrooming and the majority are a result of "copying other successful ventures instead of taking the effort of innovating new and different ones depending on the demands of the market". In the western world, since

SMEs have ready R&I information, they dare to do business that has not yet been widely done by others (Perkmann & Walsh 2007).

In Uganda, since the post-independence days of the 1960s, there have been attempts at setting up incubation centres to provide support for SMEs with innovations and nurturing start-up businesses. Later universities and research institutions also came on board as they started establishing incubation centres as a way of spinning off small business start-ups. The incubation centres had special laboratories for students and emerging entrepreneurs. In these incubation centres, they tested and developed solutions which could be "applied in real life experiences" (Mutambi et al. 2010:208). This approach however has weaknesses such as: insufficient business support, inadequate physical and operational infrastructure, inadequate capacity to exploit opportunities and generally low levels of private sector participation in research and innovation.

Available literature indicates a number of factors that are influencing SMEs' access to, and utilisation of R&I information. Such factors include but are not limited to timeliness, accuracy of the information, functionality of the formal and informal sources, information sharing platforms, infrastructure, financial services, regulatory framework among others (Mutula & Brakel 2007; Okello-Obura et al. 2007; Kazoora et al. 2006; Hassink et al. 2016; Oteh 2011). In a related study on SMEs in Kenya, it was noted that access to timely, reliable and relevant information on "markets opportunities, production, technology and government regulation" was inadequately provided by the informal sources of information, yet they are the main sources of R&I information for SMEs (Gikenye & Ocholla 2012:46). Good quality, timely and relevant R&I information is critical for SMEs' innovation, business processes and decisions.

The factor of libraries and information centres cannot be ignored. Innovation is considered to be one of the "backbones of libraries and information centres' development process" (Polat 2016:141). Compared to other library types, university libraries have more efficient innovation potential for SMEs, entrepreneurial minded, intellectual and eager users. Some crucial stages of innovation activities that can be facilitated in university libraries lend themselves to establishing key customer's needs, desires and interests. The university library innovation development process identifies and evaluates their potential beneficial users' skills and experience.

There has been a growing perception among business proprietors that any R&I information can be accessed from internet and therefore there is less need to go to the library, however research has shown that searches performed on the internet or intranet were "unsuccessful one third of the time" (Donnelly & Craddock 2007:46). Drew (2003:79) doesn't entirely agree with this as he argues that many SMEs have made "innovative uses of internet technologies to invent new business models or to enhance existing practices". All this is precipitated by globalisation, increasingly sophisticated information sources like company desktop databases, business group emails and list serves. Lloyd (2003) argues that the distinction between successful SMEs and mediocre ones is in the way they build their business corporate knowledge from their sophisticated information pathways. Rosenburg (2002:10) concurs with this stating that "successful business people know very well, that certain types of information convey significant strategic advantage to a company". Such scenarios are causing information professionals to take on a holistic approach instead of the traditional one which they were trained at the university (Donnelly & Craddock 2007).

Government also has a big role to play. According to Oteh (2011:21) government programmes can "complement and support policies directed towards SME innovation and development". In order for these government support schemes to support innovation and business development, they should be constantly evaluated and revised based on experience, research and best practices around the world. Governments can promote innovation and entrepreneurship through information programmes, building awareness of entrepreneurship opportunities, introducing SMEs to existing economic incentives, conducting trainings in accessing and use of commercial bank loans and putting in place supportive legislature.

3.5.1 Adequacy of R&I Information for SMEs

SMEs, most especially those found in rural areas access R&I information from a variety of sources, but its adequacy and reliability differs according to the "nature of relations with and level of trust in the various sources" (Sseguya et al. 2012:55). The adequacy of this information highly depends on the capacity of the SME to hold accountable the providers of the information. Some of SME R&I Information providers are linkages such as farmers, extension, private sector, and local leaders, therefore it is not easy to hold them accountable for poor quality R&I Information. This study therefore investigated whether through university libraries, SMEs could establish a feedback loop and partnerships which can be

used to improve the adequacy in the generation and dissemination of R&I information for SMEs.

There is a growing emphasis on the 'role of innovation' in SMEs and how it contributes to economic development (Blackburn 2003:10). Many SMEs are reluctant to adopt formal rights such as patents and trademarks. This scenario creates questions as to whether the SMEs understand the innovation and intellectual property management system, as well as what the nation's research agenda is doing about it. While all these questions might not be answered in this study, an attempt is made to see how the university library address any of these questions more so the issue of how the library can help SMEs protect their intellectual properties.

Owing to the difficulties in dissemination of local R&I information, many R&I information seekers in the developing world depend on R&I generated from developed countries which in most cases "may not be appropriate to address the local problems" (Ezema 2011:474). The researchers struggle to publish the research findings in internationally recognised journals as the local journals have low visibility and are not indexed or abstracted in the international databases. A few researchers who struggle and endure the rigour to publish their works in such journals are often disappointed when university libraries fail to pay subscription to those journals.

Relatedly, Extant literature considers networking fundamentals within entrepreneurship. Through networking, SMEs leverage resources, identify opportunities, test ideas and gain feedback (McAdam & Soetanto 2018). It has further been reported that significant positive relationships between "inter-firm cooperation, cooperation with intermediary institutions and cooperation with research organisations" greatly stimulates innovation performance in SMEs (Zeng et al. 2010:181). This study was done on Chinese SMEs and it revealed that inter-firm cooperation has the most significant positive impact on the innovation performance of SMEs. It was further noted that linkages and cooperation with government agencies do not demonstrate any significant impact on the innovation performance of SMEs, instead the researchers advised that SMEs could seek more cooperation with other partners, such as research institutions, universities, and intermediary institutions. This was the essence of the current research, studying how university libraries can establish cooperation networks with SMEs in Uganda.

3.5.2 Research and Development for SMEs

SMEs today can no longer innovate in isolation. They have to engage different external partners to acquire ideas that would enable them "stay abreast of the business competition" (Dahlander & Gann 2010:699). Large firms normally set up Research and Development (R&D) units to specifically deal with innovation but this is quite expensive for small and medium firms. The easiest option to this dilemma is open innovation where firms seek for innovative ideas for their businesses from external sources.

Acquisition and transfer of technology through R&D is one of the major means by which firms can raise their competitiveness in the international markets. R&D is therefore supposed to be supported by policies and institutional development such that it bears fruits of "technological innovation, competitiveness and international trade" (Aikaeli 2007:4). Many leaders in large, medium and small industries who are responsible for R&D want to be assured of a body of knowledge which can support their work within their limited resources. University libraries can therefore champion this cause as they are the "nearest and reliable information partners" in this cause (Chiware 2010:398).

Actually local university and higher academic institutional libraries can partner with SMEs by "prioritising infrastructure support" for agricultural R&D to be carried out with the participation of farmers (Doran et al. 2009:22). Though critics may categorise this approach as exclusively high-tech driven by western science, this local research approach can also take into account the latest scientific R&D information from local agricultural researchers from Ugandan universities.

With the increase in food demand driven by population growth, the agricultural sector is becoming more attractive for business. This is true because no matter how hard things become, people still need to eat. Therefore, the agricultural potential gains in a developing country like Uganda are huge, more so in the application of innovations that come from R&D. Agricultural SMEs need R&D innovations to ensure efficient irrigation, fertiliser, seed selection, as well as improved market access and transport to facilitate big gains and improved returns in the short term, but also promote long-term sustainable farming practices. Ugandan agricultural SMEs are just emerging as a potential stand-alone asset class facing numerous risks and inefficiencies, but all this can be reduced through "pursuing innovation and human capital development from R&D" (Doran et al. 2009:36-37).

Reviewed business literature on small businesses in Uganda reveals that there is limited R&D attempts to moderate the effect of technology in SMEs. According to Leitch and Harrison (2018:32) it is not only in Uganda but also elsewhere in the world where "research on entrepreneurship leadership is still in its infancy". Therefore, the performance of Ugandan SMEs vary with the choice of adopted business strategies that result in building core competences with regard to competitive advantages. Additionally, "R&D technological complexity" of SMEs moderates the relationship between the SME business strategy and its performance (Donat 2007:39). Conducting a study in this relationship offers a fertile ground for exploratory and innovative research and ultimately an opportunity to redefine R&D in SMEs. This study therefore investigated the role technology plays in facilitating R&I information for SMEs in meeting overall customer needs and surviving in a stiff competitive environment.

3.5.3 R&I Information for SMEs in the Agricultural Sector in Uganda

SMEs in the agricultural sector recognise that R&I information not only relates to codified knowledge for their business but also relates to competitor knowledge and market penetration for the SME itself. According to the Economist Intelligence Unit (2007), access and utilisation of R&I information can greatly be facilitated by technology. It is on this technology that collaborative networks can be built to filter and verify R&I information for better decision making for SME in the agricultural sector.

The implication of technological developments on traditional information management practitioners such as university libraries are far reaching. In January 2009 in Rome, Scholars debated the future of agricultural libraries and how they could sustainably contribute to knowledge sharing for agricultural development and food security. It was noted that most participants argued that future university libraries will play a wider range of roles such as "actively opening access to information and knowledge, collecting, documenting and disseminating R&I information, catalysing knowledge sharing among SMEs, providing integrated platforms for information and knowledge management, and in providing a range of targeted services and products" (Ballantyne 2009:268). They further noted that future university libraries would be more 'e-libraries', providing access to "current and archival knowledge in digital formats, places of exchange and interaction" by SMEs which facilitate sharing and collaborating with R&I information (Ballantyne 2009:269).

However, scores of scholars have argued that allowing the value of having access to information and the ability to use ICTs does not guarantee any improvement in business enterprise but the deeper ability to "retrieve, interpret and use that information as new knowledge" (Fourie & Bothma 2006:477). The key ingredients to success here is that focus should not only be put on access to the R&I information but more effort should be put on how SMEs are utilising this information for the growth of their enterprises. It is resourceful research which can enable SMEs utilise R&I information to produce quality products for the market. Research like the one done in universities can drive innovation which later will translate into "industrial growth, job creation, increase in the tax base and improved export potential" (Sanya 2016:30). Obstacles to such creativity can be minimised by encouraging "business education" among SME owners (Sebikari 2014b:53). Through this business education SME business are coached on new ways of improving existing products and developing new products that are on high demand.

In a nut shell, this study investigated the perception of R&I information among SMEs and also how university librarians are managing it for their benefit. It further explored how university libraries can enhance the development of entrepreneurship of SMEs through conducting business education with their R&I information collections. Through the fourth research question, this study sought to understand factors and perceptions influencing access, adequacy and utilisation of R&I information sources and services by SMEs in the agricultural sector in Uganda.

3.6 Challenges Faced in the Provision of R&I Information to SMEs

Challenges faced by SMEs in accessing R&I information can be broadly categorised into five categories which are: "political, funding, infrastructural, institutional, cultural and personal attributes" (Kanyengo & Mugalo 2008:192). Below is a review of literature following these five categories.

3.6.1. Political Challenges

In the developing world especially in Sub-Saharan Africa, governments and political leaders "greatly influence and control the information their citizens access" (Kanyengo & Mugalo 2008:194). This therefore means that there might be valuable R&I information the universities wish to disseminate to SMEs, but may not be favourable to the politicians in power, such information will be censored. This may cause SMEs to suffer just because the

politicians feel their position of authority may be threatened by such information. Some governments go to the extent of cyber bullying, tapping private phones and monitoring emails, which all ends up curtailing the dissemination of R&I information.

Most university libraries in Sub-Saharan Africa are poorly funded by government on whom they are wholly dependent making it difficult for them to offer efficient and effective information services (Kavulya 2006; Okiy 2005; Rosenberg 1998; Okojie 2010; Temu et al. 2005). This reason has been highly advanced as being responsible for the dissatisfaction of users with library and information services patrons are provided with (Okello-Obura et al. 2007; Rufaro et al. 2008).

Hall and Nahdy (1999) investigated the satisfaction of agricultural SMEs with R&I information provided to them and found dissatisfaction with methods for disseminating information that were prescriptive and too coercive. They further noted that there were challenges of structural nature such as lack of policy framework and a non-flexible information system that were not client-focused to generate, manage and effectively disseminate R&I information.

There are challenges of offering library services to persons with disabilities and they are largely political in nature, most especially those which are physically disabled and those with visual impairment. Musoke (2008:536) argues that many African university libraries are cognisant of the need of special ICT facilities for serving persons with disabilities but the "cost of procuring them is too prohibitive". For example, Zimbabwe university libraries have embraced policy frameworks that are all encompassing and inclusive, but are curtailed by lack of resources, funding, trained staff in handling People with Disabilities and negative perceptions of other library patrons (Chiparausha & Mavhunduse 2014:177-178). At Makerere University Library, it had to take donors and development partners to include a "disability unit with modern ICT facilities" in the library (Musoke 2014:189).

Library staff are not finding it easy extending their services to persons with disabilities most especially those with low vision or total visual impairment. This condition incapacitates them for accessing information whether in print or in digital form, whereas, there are initiatives to empower them to use white canes and other independent living skills; "not much has been done to empower them with skills of using the digital library" (Bobier & Paterson 2008:117). There has been a long debate on the conversion of information materials for persons with

sensory impairment and a strong case has been made to the effect that these materials should be exempted from the copyright restrictions (Nicholson 2008). SME persons with visual impairment will need a strong lobby group to cause government and other stakeholders to come to their plight.

As far as policy and regulation is concerned, there is a scholarly increase in the discussions on the subject of SMEs which is causing government to respond with interventions of designing entrepreneurship and SME policies (Hoffmann & Storey 2018). This is being done because it has been discovered that poorly made policies, even though with a noble objective, risk being ineffective. This therefore suggests an open minded research on the theory of SME public policy (Kitching 2018). This kind of research should focus policy regulation on entrepreneurial processes and outcomes.

3.6.2 Institutional

A key challenge for re-engineering research and innovation information services for SMEs is "failure to review university policies" (Mastel 2011:213). Today's emerging computer applications and possibilities are rapidly altering perceptions and even complicating the situations for libraries. These applications have created new expectations for better usability, faster response to university library patrons' needs which has in turn exposed the limitations of the university libraries like "the limited opening hours, strict membership requirements, restricted information access and inadequate user involvement" (Kwanya 2016:64). This study investigated whether university libraries are redesigning their policies to promote self-service, disintermediation, increased user satisfaction, seamless use of technology, convenience and ease of use of library systems.

University libraries are facing institutional challenges in the day to day running of their libraries. According to Ugah (2008:7), Michael Okpara University of Agriculture library's resources were not readily available and accessible. The main cause of this anomaly was either the resources were not acquired or were waiting in the library's processing unit. The resources could still not be obtained through inter-library cooperation and photocopying. Even the few available resources were not easily accessible to the users due to poor indexing and cataloguing, inefficient loan and circulation system, poor shelving, and lack of adequate guides to library arrangements, as well as administrative and physical barriers. Such scenarios are very common in many African libraries. Internationally, a number of treaties and

agreements have been signed which promote free access and sharing of library information such as R&I information. However, they cannot achieve a lot because they have not been ratified by the African nations and adopted by the universities, especially the university libraries. It should be remembered that all these agreements are geared towards the achievement of the 2030 Sustainable Development Goals (SDGs), hence the earlier they are implemented by the concerned the better.

Sometimes challenges can present themselves inform of disasters like fires, floods, hailstorms, burglary which sometimes are a result of nature, malicious damage and even sheer negligence of staff members. For example Chaputula and Mutula (2016:101) report of a fire that destroyed most of the "libraries' ICT equipment in Mzuzu University in Malawi in 2015". Many Sub-Saharan universities struggle to acquire such equipment, now when it is destroyed by such disasters, it might take long for such universities to replace it and that negatively affects good service delivery.

The copyright issue is another burning matter as there has not yet been a 'comfortable balance' between the protection of rights of the authors of R&I information against the open and free access to their works by library users like SMEs (Ferguson 2010:64). Another challenge that is common in African libraries is lack of "networking and collaboration" (Musoke 2008:537). Many university libraries are working in isolation, yet they would have done much better if they were networking and collaborating.

3.6.3 Funding

Most ICT equipment that is used in collecting, storing and disseminating R&I information in university libraries is imported and the "cost is always prohibitive" (Kanyengo & Mugalo 2008:196). For example, though Dspace is open source the average cost of setting up an institutional repository is $1,000 and above and this is too expensive for many university libraries in Sub-Saharan Africa.

There is a high penetration of mobile smart phones and this on the side of SMEs is an advantage as their prices are reducing with time which would ease access to internet and the library websites, as well as the Integrated Library Systems (ILS). In spite of the opportunity for university library staff to provide better services to the external users in their preferred formats, some studies show that some institutions place restrictions on these technologies in

the "guise of limiting the costs of bandwidth, and shortage of library staff members" (Naidu & Constable 2016:130).

Inadequate funding remains by far the leading challenge to university libraries in Sub-Saharan Africa and places such as China, despite the fact that it was not affected by the effects of the global financial crisis (Ferguson 2010:64). Lack of funding also affects marketing and creating publicity for the university libraries' R&I information. According to Jabir and Katabalwa (2016:392) university libraries may wish to market their resources in the form of printing leaflets and brochures but are "curtailed by lack of funding". At Makerere University, the library "introduced a library technology fee" for all students during the academic year 2008/9 (Musoke 2008:536). This study was specifically in part interested in following up how far this fee tried to address inadequate library funding.

3.6.4 Infrastructural Challenges

Inadequate infrastructure is one of the leading challenges hampering the access of R&I digital and online resources in most African countries (Watts & Ibegbulam 2006). There are still constant power shortages in Uganda yet effective use of electronic equipment "requires uninterrupted power supply" (Kanyengo & Mugalo 2008:196). Ngwira (2014:72) reports of similar problems of continued "power cuts and low internet speed in university libraries in Malawi". The fact that university libraries have little control over "internet connectivity makes their outreach programmes and communication very challenging" (Mastel 2011:213). Though internet is fronted as one of the infrastructural challenges, some scholars have argued that it increasingly causes distraction among readers whose reading habits have shifted from isolated deep reflection to very "shallow reading without any contemplation" (Miller 2011:103).

According to Musoke (2008:536) Makerere University library has a target of "user-computer ratio to be 5:1, but it is currently 25:1 which is five times worse off", needless to mention the bandwidth problems. This is not peculiar to public universities like Makerere University, but even private universities as stated by Olaojo and Oyebaode (2016:123) that these same factors like inability to acquire "state of the art working equipment, inadequate information and communication technology (ICT) tools" gravely hinder work commitment of the private university library personnel in Nigeria.

The "library buildings need to be continuously renovated" to provide user friendly environment to attract the SME patrons (Ferguson 2010:64). The "maintenance of library system and equipment is still very poor" in many Sub-Saharan African university libraries (Buwule & Ponelis 2014:8). These libraries lack adequate hardware such as: Computers, overhead projectors to access the information sources in "non-print media and in electronic forms" (Ugah 2008:7). Obanda (2011:2429) observed that given an opportunity to make a decision between investing in stakeholder competence or library information systems for SMEs on the backdrop of limited financial resources, "it pays off slightly more to invest in stakeholder competence". But still at the end of the day, stakeholder competence and information systems are complimentary and mutually reinforce each other.

3.6.5 Personal and Cultural Challenges

Lack of critical skills in the use of online R&I information provided by university libraries can be a great hindrance yet there are "massive amounts of such information online" (Kanyengo & Mugalo 2008:192). University libraries are faced with an enormous need to upgrade the "technical and customer service skills of their staff members" (Ferguson 2010:64). Hendrix (2000:214) posits that key barriers to library outreach programmes include "variation in interpersonal skills and workload of university library staff, lack of a clear ongoing support from the top management, and lack of time and valuing commitment to the programme".

Furthermore, technical skills of scores of university library staff are inadequate. For example in a study by Chaputula and Mutula (2016:104) it was reported that both students and staff were very enthusiastic about the university's use of mobile services to reach users, but were challenged by the "lack of adequate skills by library staff to run the service". Several cases have been reported of the unfamiliarity of library users with modern ICT applications, resulting in less effective use of library resources, library technologies, procedures and equipment which results in the failure of the users undertaking independent reading and developing critical reasoning (Sawahel 2017).

Different reports have shown that a number of people from Sub-Saharan Africa, are still struggling with "poor reading habits, low literacy levels", and yet most of the R&I information is in English (Kanyengo & Mugalo 2008:199). For example, Uganda alone has over 50 languages so translating R&I information into 50 different local languages can prove

to be an uphill task. Similarly, in Zambia, agricultural research information disseminated through brochures and flyers "could not be accessed by the farmers because of language barriers and long distances they have to travel to the information centres" (Mtanga, Malauzi & Mwale. 2014:309). According to Byamugisha (2009:7), "universal access to knowledge remains restricted to the elite" who are familiar with the major international languages like English.

There is a demonstrated relationship between geographic location, infrastructure, language and the access to information for development. Rural communities who lack infrastructure and also find difficulties in understanding english due to their low level of English proficiency normally find "significant barriers to access this information that is freely available in the university libraries" (Jansen & Sellar 2008:7). The challenge of translating R&I information to a local language that can be read by most readers may require installing an application that could automatically translate material from English to local languages. This study interviewed University IT officials on the feasibility of translating R&I information into local languages and SMEs responsiveness to this modification, especially the extent to which it can improve their reading habits.

Sometimes the negative perception and attitude towards ICTs can prove to be a challenge. According to Chao (2008:21) some people, most especially in rural communities, think "books are for highly educated people and scholars are the only ones that can go to libraries to do research". Such people discourage their friends from going to internet cafes or to surf the internet with a belief that they are platforms for fraud, gambling, playing games and pornography. With such a mentality, it is difficult to convince an individual that they can access good information on the internet that can benefit them or their business.

This study through the fifth research question, explored challenges faced by university libraries in providing R&I information services to SMEs in the agricultural sector in Uganda.

3.7 Summary of Literature Review

This chapter reviewed literature related to the agricultural transformation of SMEs through the application of R&I information in university libraries. The chapter is organised around research themes, obtained from research questions and the theoretical framework which was applied in this study. The major themes included the management of R&I information in university libraries, re-engineering university libraries R&I information services, access and

utilisation of R&I information by SMEs, factors that influence innovation in agricultural SMEs and challenges faced in the provision of R&I information for SMEs.

A summary of research gaps identified from the literature reviewed relate to the low level of preparedness of Ugandan University libraries to serve SMEs with R&I information, the negative value university libraries attach to serving SMEs with R&I information, the low extent to which university libraries in Uganda have positioned themselves as centres of interdisciplinary research, the few initiatives taken by Ugandan university libraries to repackage R&I information for SMEs, the limited modalities put in place to efficiently market R&I information particularly to SMEs, the insufficient use of social media platforms in disseminating R&I information, the failure of designing strategic partnerships between university libraries and other providers of R&I information, the non-awareness of opportunities embedded in the access and utilisation of R&I information by agricultural SMEs in Uganda, the insufficient possession of required skills by SMEs to access and use R&I information, requirement of special skills by university library staff to serve SMEs with R&I information, the need to design suitable IL programs for SMEs by university libraries in Uganda, the impetus to streamline the role of technology in facilitating the access and utilisation of R&I information in SMEs, the need for policy regulation on how university libraries can promote and support the entrepreneurial initiatives of SMEs in Uganda, the requirement for the presence and functionality of software that translates R&I information from English to Ugandan indigenous languages among others. This study attempted to address all these research gaps.

Further still, from the reviewed literature, it is evident that Ugandan university libraries need to re-engineer their research and information services for SMEs as their contribution to development through engaging the surrounding small and medium business communities. This re-engineering can be done by supporting talented innovations; disseminating information about these innovations to SMEs where they can be applied; providing library spaces where SMEs can find university libraries as hubs for future cutting edge technology; creating a user-friendly library environment where SME users can arouse their talents, innovations and technology in a relaxed atmosphere and with equipped and skilled university library staff members who strategically share knowledge with everybody irrespective of whether they are students, staff, members of the community, disabled or other library users.

CHAPTER FOUR

RESEARCH METHODOLOGY

"We set goals to give us a balanced life because we are people and not programmed devices"
By Ratan Tata

4.1 Introduction

The purpose of this study was to investigate how Ugandan university libraries could re-engineer their research and innovation information for SMEs in the agricultural sector. The study addressed the following research questions: (i) What are the R&I information services provided by university libraries to SMEs in the agricultural sector in Uganda? (ii) How can the R&I information sources and services in university libraries be re-engineered to serve SMEs better? (iii) What skills and competencies are needed by SMEs to effectively access and use R&I sources and information services? (iv) What factors and perceptions influence access and utilisation of R&I information sources and services by SMEs? (v) What challenges are faced by university libraries in providing R&I information sources and services to SMEs?

The purpose of the research methodology chapter in a PhD thesis is to demonstrate a "claim of significance showing how research questions are articulated and asked in the field" (Clough & Nutbrown 2008:32). Moreover, accurate and thorough descriptions of major procedures are elaborated to offer "reasonable understanding of standard research conventions" which are followed during the whole research exercise (Locke et al. 2010:159). The decisions on the selections of methods to be used in a piece of research within a specified paradigm in this study are made in "light of specific situations and phenomena" (Clough & Nutbrown 2008:18).

This chapter presents the research paradigm, research approaches, research design, data collection methods, data collection instruments, population, sampling techniques data analysis, validity, reliability and ethical issues. Broadly, the chapter is organised into 12 sections: 4.1 introduction; 4.2 meaning of research methodology; 4.3 research paradigms; 4.4 research approach; 4.5 research design; 4.6 research population; 4.6 sampling techniques; 4.8

study area; 4.9 data collection methods; 4.9 research instruments; 4.10 data analysis and presentation; 4.11 ethical considerations and 4.12 summary.

4.2 Research Paradigm

Traditionally there are two research paradigms: positivist (objectivist) and interpretivist (subjectivist) (Locke et al. 2010:79; Blumberg et al. 2008:19; Allan 2010:21). The interpretivist is "soft, subjective and based on individual experiences, while the positivist approach is hard, objective and deals with quantifiable data" (Allan 2010:21). The study of research paradigms stems from ontology which deals with the study of social phenomena. As already suggested, the two positions can also be seen as nominalist and realist. The nominalist (interpretivist) views the world as something socially constructed collecting subjective experiences, while the realist (positivist) sees the world separate from the individual and research is done objectively using "scientific and experimental methods" (Allan 2010:21).

4.2.1 Positivism

Positivist research paradigm is adopted from the natural sciences and is commonly triggered by a hypothesis, which must be "tested and verified using statistical mechanism and experimentation" (Creswell 2003:18; Blumberg et al. 2008:20). According to Blumberg et al. (2008:20) since the positivist paradigm is adopted from the natural sciences, it is governed by three principles: "the social world exists externally and therefore should be viewed objectively, research is value free and the researcher is independent taking the role of an objective analyst". Scholars have contended that this paradigm does not yield a "rich understanding of key social issues that directly affect human beings" (Bryman 2004:19). Law, Harper, Jones and Marcus et al. (2013:398) also concur with the above and assert that "positivism is a form of scientific methodology that believes that there is a single true world of science" that can identify causes and laws regarding the real world. In other words research properties should be measured using objective methods rather than being inferred subjectively through "sensation, reflection and intuition" (Easterby-Smith, Thorpe & Jackson 2008:57).

This philosophy of research was first developed by Rene Descartes in 1637 (Snape & Spencer 2013:5-6). He argued that positivist research promotes objectivity and evidence in research and that researchers in this paradigm should always distance themselves from any influence that could corrupt their analytical capacity. This debate was also expanded by

David Hume and Auguste Comte. For example, Comte stated that intellectuals always come and go but "real knowledge is based on observed facts" (Easterby-Smith et al. 2008:57). The main strength of this research paradigm is that it can provide a wide range of situations, it is fast, economical and its aggregated statistics can be very relevant to policy makers. Its limitations are that "its methods are inflexible, artificial, not very effective to understand the processes, the significance people attach to their actions, and not very helpful when formulating theories" (Easterby-Smith et al. 2008:71). The positivist paradigm is not singularly suitable for this study because this study is largely going to understand the key social issues directly affecting the university library and the SME workers like staff behaviours, organisational beliefs, SME workers' attitudes, the relationship between library staff and SMEs among others.

4.2.2 Interpretivism

The Interpretivist paradigm on the other hand is used in understanding the entire context at both the macro and micro level, and is driven by "subjective interests of the researcher" (Blumberg et al. 2008:21). It is based on three principles namely: "that the social world is constructed and is given meaning subjectively by people; the researcher is part of what is observed and research is driven by interests" (Blumberg et al. 2008, p.21). The interpretivist researchers do not attach great importance to generalisation of findings because they believe human beings are characterised by high complexities. Scholars have argued that though understanding people and their behaviours requires subjectivity inherent in humans, these "subjective interpretations are not unique, people can share or have similar behaviours" (Blumberg et al. 2008:22).

Interpretivism was first associated with Immanuel Kant in 1781 who proposed that this kind of research transcends basic empirical enquiry because the world of knowledge is based on understanding and perception relating not only to senses, but also human interpretations. Some of the strengths of this paradigm are: it has the ability to study how change takes place over time; it can get the meanings behind people's actions; and how to adjust to new and emerging issues and ideas. It also contributes to the evolution of theory. Its weakness are: "its data collection processes are time consuming, costly, data analysis is complex and policy makers give this paradigm low credibility claiming that it is based on subjective opinions" (Easterby-Smith et al. 2008:72-3). Wilhelm Dilthey and Max Weber argued that "self-determination and human creativity play a very important role in this kind of research"

(Snape & Spencer 2013:7). For this reason, the interpretivist paradigm like positivist paradigm is not singularly suitable for this study because of the need to balance studying human perceptions and experiences subjectively, as well as the processes and systems they use objectively. Table 4 is a comparison between the positivist and interpretivist research paradigm.

Table 4:The difference between the Positivist and Interpretivist research paradigms

S/No.	Research Approach	Positivist	Interpretivist
1	Assumption	Objectivist	Subjectivist
2	Ontological	Realism	Nominalism
3	Human Nature and Agency	Determinism	Voluntarism
4	Research Logic	Deductive	Inductive
5	Research Methodology	Survey and Scientific Experiments	Action research, case study, ethnographic and Grounded theory research
6	Data Collection Methods	Questionnaire, Interview, Experiments and Observation	Questionnaire, interview, Focus group, use of text and observation
7	Data Analysis Methods	Statistical and Numerical methods	Descriptive statistics, textual analysis and discourse analysis

(Source: Allan 2010:20,34)

Based on the above analysis, qualitative and quantitative methods should not be seen as opposed research methods but instead should be seen as complementary strategies. This view has therefore given birth to modern research paradigms such as the pragmatic and post positivism research paradigms.

4.2.3 Post Positivist Research Paradigm

Borland (2001:5) asserts that practical research combines both interpretive and positivist research paradigms. Besides, there is an increasing appreciation of new approaches that mix both quantitative and qualitative methods such as the post positivist and pragmatic paradigms. Post positivism is a philosophy of reality that believes in external objectivity but very sensitive to the “complexity of the realities, limitations and biases of the researchers who study them” (Schutt 2006:40). In other words, post positivism believes that the goal of

scientific research should lead to inter subjective agreement among researchers about any phenomenon under investigation.

Borland (2001:5) concurs with the above and states that "practical research combines both interpretive and positivist research paradigms". Post positivist paradigm accepts all discoveries with a view that a responsible researcher demonstrates objectivity during the discovery process (Pickard 2007). The main strengths of this paradigm is that it accepts values from multiple sources of data and perspectives; generalisations can be made beyond boundaries; it promotes efficiency and use of specialised agencies, though on limitation side it is costly; its standards sometimes clash with the traditions and research cultures of institutions and sometimes "reconciling discrepant sources may prove to be a headache" (Easterby-Smith et al. 2008:73).

This study adopted a post-positivist paradigm because it combines qualitative and quantitative approaches simultaneously. Since the study was on how university libraries can support SMEs with R&I information, it required exploring the realities, human behaviours, actions, "organisational beliefs, intricate relationship between staff attitudes, external structures, and socio-cultural issues" (Creswell 2009:6-7). The post-positivist paradigm is suitable for this kind of study because it is deterministic and follows a reductionist philosophy which identifies and assesses causes that influence outcomes with the aim of "testing, verifying and refining a theory" (Creswell 2009:7). The post-positivist paradigm guided the data gathering process as the research questions were posed to answer the research problem.

4.3 Research approach

There are three recognised research approaches namely "quantitative, qualitative and mixed methods" (Creswell, 2009:3). All these three approaches represent different ends of the continuum where a qualitative approach tends to use more of words, while a quantitative approach uses numbers and the mixed approach incorporates both elements.

4.3.1 Quantitative Approach

Quantitative research approach relies on numerical data to test relationships like "experiments, test theories about reality, testing hypothesis, magnitudes and frequencies" (Ivankova et al. 2016:307). It tests objective theories by examining relationships among the "different variables of the study" (Creswell 2009, 4). This approach normally works with

large samples, randomly selected; the instruments have closed questions and the research findings are normally interpreted in light of initial predictions and prior research. Gilbert (2012:35) concurs with this as he states that one advantage of quantitative approach is that "its data has relative precision and lacks ambiguity".

4.3.2 Qualitative Approach

Qualitative research approach is an inquiry of understanding complex and holistic phenomena. The researcher collects "words, images, everyday experiences and instruments which normally have open ended questions" (Ivankova et al. 2016:309). This means exploring and understanding the "meaning of individuals or groups of people that associate with the research problem" of the study (Creswell, 2009:4). This kind of research does not stop in laboratories in specialised and customised settings, but goes to the outer world to understand, describe and explain social phenomena happening in natural settings in a number of ways as suggested by Kvale (2013:x):

- Analyses of biographical experiences, practices and stories of individuals and groups;
- Analyses of interactions and communications of people; and
- Analyses of texts, images, music, videos and artefacts.

According to Schutt (2006:289), "anthropologists and sociologists are the ones who founded this approach" while doing field studies in the early decades of the 20th century. Their dissatisfaction with the second-hand accounts and inspection of artefacts that had no connection with the realities experienced in the communities they visited during their field work followed.

4.3.3 Mixed Methods Approach

Mixed methods research approach is relatively new and builds on both qualitative and quantitative approaches to "construct knowledge about real world issues based on philosophical pragmatism" (Ivankova et al. 2016:312). This approach combines numeric and textual data concurrently or in a sequence to allow a more complete analysis of the research phenomenon (Teddlie & Tashakkori 2009); it is "the use of two or more methods in a single research project" (Alexander et al. 2012:126). This approach is very helpful when gaining in-depth understanding of trends, personal perspectives, explaining relationships among variables, explaining outcomes and advancing social concerns. It is however advised that

methods may be mixed simultaneously or sequentially where preferably "qualitative precedes the quantitative" (Easterby-Smith et al. 2008:71).

This study used mixed method approach to provide a better understanding of the phenomenon and gather richer data (Creswell & Plano-Clark 2007). This approach was found suitable since this study involved investigating "attitudes, opinions, experiences and behaviour of the research participants" (Cohen, Manion, & Morrison, 2011:161). The use of quantitative methods helped in engaging fairly big numbers of respondents to obtain "accurate generalisation of the findings" (Neuman, 2006:219). In contrast, qualitative methods helped engage fewer subjects and collect specific, unique, exclusive cases, events or actions that were used as a foundation to "clarify and deepen understanding of the phenomenon" under study (Cohen et al. 2011:161). The other reasons for applying this approach include: to know more about the topic under study; to increase accuracy of research findings; increase level of confidence in the research findings; "generate new knowledge through synthesis of the different approaches"; and to demonstrate the level of the researcher's knowledge on the different methods (Alexander et al. 2012:127-8).

4.4 Research Design

A research design is the "strategy of a study and how the plan is to be carried out" (Laxton, 2004:36). They are plans and procedures for research that span the decisions from "broad assumptions to the least details of data collection methods and analysis" (Creswell, 2009:3). Research design is governed by the notion of the fitness for the purpose of the research. In other words the purpose of the research determines the methodology and design where the emphasis is not on the "conceptual essence of the research topic but its justifiable operational description" (Clough & Nutbrown 2008:33). This is why the choice of the research design is based on the nature of the research problem, the researcher's experience and the audience for the study (Creswell, 2009). Gilbert (2012:35) compliments the above and argues that the selection of a research design depends on the "research questions, the availability of data and the researcher's own skills and preferences".

There are quite a number of research designs but the common ones include:

a) Case studies – This design studies a small number of organisations, events or individuals to get "in-depth information about them in relation to the phenomenon under investigation" (Easterby-Smith et al. 2008:97). Case studies analysis can become very complex, with "comparisons made between different actors within a

single case" (Lewis 2013:52). In this design there is usually no attempt to select a random or representative sample of cases, instead "cases which are unique or exceptional are the ones selected and the results inferred on the whole population" (Gilbert 2012:36). This study could not employ this design as it involves multiple cases of universities and SMEs.

b) Experimental Designs – This design is normally carried out in natural sciences as well as social sciences where it is called controlled group. The research elements are subjected to certain conditions or they are "manipulated by the researcher/experimenter in order to assess the effect in comparison to the elements which are receiving no unusual conditions" (Easterby-Smith et al. 2008:84). Since this design involves subjecting research elements to controlled conditions, it could not be applicable to this study which is interested in establishing the realities on the ground.

c) Survey Research Design – There are three main types of survey research design which include factual, inferential and exploratory as explained by Easterby-Smith et al. (2008:90-92).

    i. Factual are normally associated with opinion polls of customers and it is so predominant in market research.

    ii. Inferential survey designs are aimed at establishing relationships between variables, concepts, assumptions, and hypotheses regarding the concepts under study (Gilbert 2012:36).

    iii. Exploratory design attempts to develop universal sets of principles against which any organisational culture can be measured. Since this design tries to predict the behaviours of individuals and an organisation, this study adopted it to measure the set principles of university libraries in serving SMEs with research and innovation information.

d) Descriptive Research Design – The main purpose of this design is to describe characteristics of a population or phenomenon. It focuses on answering who, what, when, where and how questions, and it is very popular in business and market research. Accuracy is of paramount importance in this design as the "findings are used by managers when making decisions on production, scheduling and budgeting" (Zikmund 2003:55).

This study therefore used an exploratory research design which is a sub set of survey research design because it was found to be "appropriate for studies whose developments are still limited" (Cooper & Schindler 1998:61). The researcher studied how university libraries can restructure their R&I information for use by agricultural SMEs in Uganda.

4.4.1 Exploratory Research Design

Exploratory research begins working from a "deductive theory on variables laid out in advance moving to the unfamiliar ones" (Babbie 2004:88). Exploratory studies are valuable scientific research when breaking new ground and it yields new insights. Zikmund (2003:54) further argues that this design is employed to "clarify ambiguous problems such that better understanding of their dimensions and magnitude is obtained". This therefore makes this design on one hand simple, but on the other complex because it attempts to investigate whether the phenomenon exists or not (Dane 2011:7).

This study found it necessary to use exploratory research design to "seek for new insights" (Saunders et al. 2009:139). This design was therefore suited for this project because it enabled the researcher to analyse the potential of R&I information in university libraries and later come up with conclusive evidence that can lead to a particular course of action on how SMEs can access such information from university libraries.

4.5 Population

A population is the "aggregation of the elements in a study" (Babbie 2004:190). It is a "complete set of cases" about which generalisation of the research findings are to be made (Laws et al. 2013:398). This is the complete group of people, SMEs, university libraries, post graduate students and academic staff involved in this study. The uniqueness of a population is based on the similarity in characteristics shared by a population (Zikmund 2003:369). After studying these "characteristics, practices, beliefs and values", the findings are automatically generalised on the entire set of these individuals or entities (Schutt 2006:134).

The research design used in this study guided the choice of the sample frame which corresponded well with the population.

4.5.1 Small and Medium Enterprises in the Agricultural Sector in Uganda

The unit of analysis for this study are SMEs in the agricultural sector in Uganda. There are approximately 458,106 firms in Uganda (Uganda Bureau of Statistics, 2011:34, 35), and the agriculture sector has the largest number of business establishments with 8,168 agricultural

firms registered (Uganda Bureau of Statistics, 2011:26). This study concentrated on SMEs in the agricultural sector since agriculture is the bedrock of Uganda's economy (National Planning Authority-Uganda 2013). The study was particularly fixated on the dominant line of business which were crop production, livestock production and mixed farming. This study therefore focused on the 1,155 SMEs in the agricultural sector dealing in crop production, animal production and mixed farming which dominate agricultural small and medium business enterprises in Uganda (Uganda Bureau of Statistics 2011:39). The analysis of SMEs was limited to the Central and Kampala region only because Kampala has the highest number of SMEs, while the central region has the highest number of agricultural SMEs.

4.5.2 Ugandan University Libraries

The study focused on universities which offer postgraduate academic programmes in agriculture since R&I information is mainly generated by academic staff and post graduate students. There are currently 14 Universities in Uganda offering agriculture programmes and among these, only 6 have postgraduate programmes; they include Makerere University (2016), Kyambogo University (2016), Uganda Christian University(UCU) (2016), Uganda Martyrs University (UMU) (2015), Gulu University (2016) and Ndejje University (2016).

From each of the six universities, the study purposively targeted the university librarian, the head librarian of the R&I information library section, the head of IT, the academic staff of the agricultural department and postgraduate students registered in agricultural programmes. Whilst the analysis of SMEs was limited to the Central and Kampala region only, the analysis of University libraries was nationwide covering all Universities with post graduate programmes in agriculture. This was done because the number of libraries is manageable and researchable, and it would give the study a national perspective.

The university librarians were chosen because of their role in policy formulation and implementation, infrastructure development, budgeting and general administration and management of the university libraries. The heads of R&I units were chosen because they are responsible for the systematic and procedural processes related to the design and implementation of R&I services. They are also responsible for managing the institutional repository, research commons, student dissertations, theses, and research collections of the library. The head of IT offers technical support. The academic staff of the agricultural departments and post graduate students were surveyed because they are the major consumers

of the R&I information for their academic purposes and also the producers of R&I information which is to be disseminated to the SMEs.

4.6 Sampling for SMEs

Sampling is the "process of selecting research participants" for a research project (Dane 2011:106). There are two main types of sampling: probability and non-probability sampling. According to Ritchie, Lewis and Elam (2013) probability sampling is where elements of the population are chosen at random and all elements have equal chance of being chosen in order to produce a statistically representative sample. Examples of probability sampling include "simple random, systematic, cluster, stratified and multi stage" (Easterby-Smith et al. 2008:216).

There are a number of probability sampling strategies that were used in this study:

a) Census sampling is perhaps the earliest as it systematically involves the entire population. Its employed "to avoid errors that arise from using subsets" and therefore it is suitable for fairly smaller populations (Groves et al. 2009:6). This strategy was employed on university libraries as explained in 4.6.2.
b) Random sampling is a method that gives elements in a population "equal chance, independent of any other event in the selection process" (Babbie 2004:190). Owing to its equality of opportunity in being selected, "it is considered relatively unbiased" (Fink 2010:92). Operationally, drawing a simple random sample requires a numbered list of the population. Random sampling was used to select SMEs in their different strata as explained in section 4.6.3.
c) Stratification is the "grouping of units composing a population into homogeneous groups or strata" and it can be used in conjunction with simple random sampling in order to improve representativeness of a sample (Babbie 2004:205). The strata are chosen following the researcher noticing "evidence of the different traits among the strata from the same population" (Fink 2010:93). The researcher equally samples from "each one of the layers of the overall population" (Leedy & Ormrod 2010:208). Maree and Pietersen (2016:195) advise that stratified sampling is used to "address the problem of non-homogeneous population" such that they are represented more precisely than in simple random sampling. This strategy was used to break up SMEs samples from region level to district or division level as explained in section 4.6.3.

In non-probability sampling on the other hand, elements of the population are deliberately selected to reflect particular features or groups within the population. Nonprobability sampling is suitable for small in-depth studies, while reverse is true. Examples of non-probability sampling include "purposive, quota, theoretical, snow balling or chain, opportunistic and convenience sampling" (Easterby-Smith et al. 2008:217).

This study employed probability sampling strategies, since large numbers of respondents were involved and the researcher wished to have scientifically derived and statistically representative samples. In particular, Saunders, Lewis and Thornhill (2009:219) statistical tables for selecting populations greater than 200 "based on 5% error margin" were used to select sample sizes. The process of deriving sample sizes from statistical tables is technically called statistical inference. This is where conclusions about a population are calculated based on a given sample size using a statistical analysis software. This sampling style is not biased and the larger the population, the larger the sample, therefore the more representative it is" (Saunders et al. 2009:218).

4.6.1 Sampling of University Libraries

Census was chosen for university libraries because the numbers involved were small. Census involves "obtaining information from each member of the population (Laxton 2004:73). Israel (1992) asserts that where populations are less than 200, it is prudent to take total enumeration (Census). This study therefore used census for populations less than 200. Table 5 below summarises the sample sizes from the universities.

Table 5: Sample Sizes of Respondents from Universities

S/No	University	University Librarian	Head R&I Library Unit	IT Staff	Agricultural Academic Staff	Agricultural Post Graduate Students		Subtotal Sample
						Population	**Sample**	
1	Makerere	1	1	1	79	1264	322	404
2	Kyambogo	1	1	1	12	38	38	53
3	UCU	1	1	1	9	15	15	27
4	UMU	1	1	1	11	32	32	46
5	Ndejje	1	1	1	5	9	9	17
6	Gulu	1	1	1	13	29	29	45
	Total	**6**	**6**	**6**	**129**	**1387**	**445**	**592**

The study employed census sampling for all categories of populations which were below 200 participants. The researcher used a statistical formula only from the Makerere University post graduate agricultural students. The corresponding sample for the Makerere university post graduate student population of 1264 was 322 (See appendix A) (Saunders et al. 2016:281). The total sample size of all universities was 592 respondents respectively.

4.6.2 Sampling of SMEs

Though they are traditionally four regions in Uganda, the Business establishment survey of 2011 divided Uganda into five regions namely: "Kampala, Central, Eastern, Northern and Western" regions (Uganda Bureau of Statistics, 2011:27). This study adopted distribution of SMEs based on 2011 Business Establishment Survey as follows: Kampala-30%, Central-29%, Eastern-15%, Nothern-8% and Western-18% (Uganda Bureau of Satistics 2011:27).

Two regions of Kampala and Central Region were purposively selected in this study because they comprised most of the SMEs (59%, 681) (Uganda Bureau of Statistics 2011:27). Secondly the SMEs dealing in animal and crop production are particularly prevalent in the Central region, while SMEs dealing in agro-processing and trading are more in Kampala region (FSD Africa et al. 2015:41). Furthermore, Kampala being urban and the central region being peri-urban and rural, gave the study good comparative cases.

The determination of sample size of SMEs was guided by Saunders et al.'s (2009:219) statistical tables for sample size based on 5% error margin. The respective sample size of the SMEs from a population of 681 was therefore 254 SMEs dealing in crop and animal production in Kampala and the Central region of Uganda (Saunders et al. 2016) (See Appendix A). Thereafter multi stage sampling technique was used to draw samples for the study. According to the business establishment survey (Uganda Bureau of Statistics 2011:40), there are 238 SMEs in crop and animal production in Kampala of which 100 (42%) are in crop growing, while 138 (58%) are in animal rearing and mixed farming.

In contrast, in the Central region, there are 443 SMEs in crop and animal production of which 182 (41%) are in crop growing, while 261 (59%) are in animal rearing and mixed farming. This means that of the 681 SMEs in Kampala and Central region, 35% are from Kampala and 65% are from the Central region. From these statistics, the same percentages were used to deduce the sample of 254 SMEs of the study, where 35% (89 SMEs) were from Kampala, while 65% (165 SMEs) were from the Central Region.

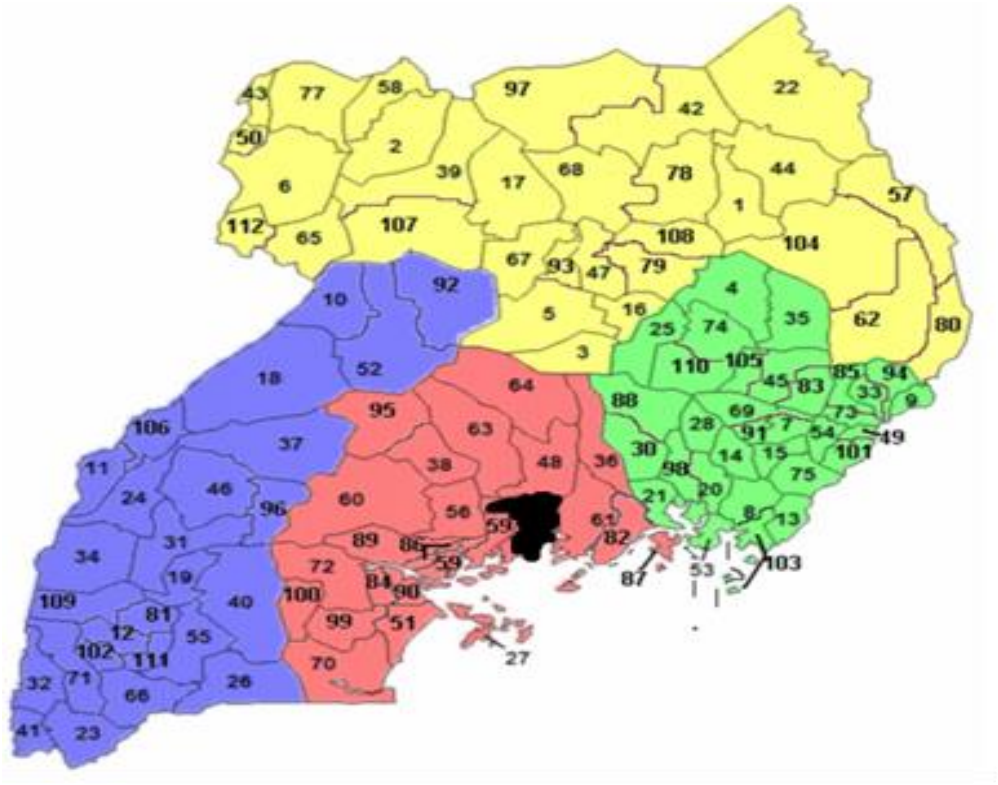
Kampala sample of SMES was stratified into five divisions (Kampala has five divisions). Therefore, from 89 SMEs in Kampala, each division has 18 SMEs. Similarly, for central region with 165 SMEs and 23 districts, each strata had 7 SMEs. According to the geographical arrangement of local governments in Uganda, Kampala region is composed of divisions, while the central region is made up of districts.

Furthermore, within each region, there were two categories of SMEs dealing in crop growing, and animal rearing /mixed farming respectively. In Kampala region where each division had 18 SMEs, 8 SMEs (42%) were randomly sampled under crop growing, while 10 SMEs (58%) were sampled under animal rearing and mixed farming. These percentages were adopted from the Uganda Bureau of Statistics (2011:40) report where 42% of the agricultural SMEs were engaged in crop production, while 58% were involved in animal rearing and mixed farming. The same applied to the Central region where from each district with 7 SMEs selected for study, 3 SMEs (42%) were sampled under crop growing and 4 SMEs (58%) were sampled under animal rearing and mixed farming.

The Uganda Yellow Pages (2017) Business directory was used as the sampling frame for SMEs.

4.7 Study Area

Kampala has five divisions namely: Kampala central, Nakawa, Makindye, Rubaga and Kawempe Divisions (Kampala City Council Authority 2016). Central Uganda has 23 Districts that include Bukomasimbi, Buikwe, Butambala, Gomba, Buvuma islands, Kalangala islands, Kalungu, Kayunga, Kiboga, Kyankwanzi, Luweero, Lwengo Lyantonde, Masaka, Mityana Mpigi, Mubende, Mukono, Nakaseke, Nakasongora Rakai, Sembabule, and Wakiso district (Uganda Bureau of Statistics 2016:50). The Figure 10 illustrates these geographical areas.



Key

	Kampala
	Central
	Eastern
	Northern
	Western

Figure 10: Map of Uganda showing the five regions of Uganda (Source: Uganda Bureau of Statistics 2016:3)

4.8 Data Collection Methods

In social research, there are mainly "four forms of data collection methods" according to Flick (2011:104) and these are surveys, interviews, observation and reviewing documents. These data collection methods are identified with "both qualitative and quantitative research" (Snape & Spencer 2013:3). All these methods serve different roles and their selection depends on factors such as "type of data sought, subject area, time frame, budget and the nature of the population" (Lewis 2013:58; Simmons 2012:185). At the onset of a research project, it is very important to identify the most appropriate methods of collecting the research data. The following is a brief description of some of the popular data collection methods used in the world of research today:

(i) **Interviews** – This is where a series of questions are addressed to an informant and the responses are recorded. Laws et al. (2013:201) argue that interviews are most useful when the study is interested in "people's experiences, views in some depth, when relying on information from fairly small number of respondents", and dealing with sensitive information where respondents may not be able to speak freely in groups. These are the reasons for employing this method in the current study.

(ii) **Focus Group Discussion (FGD)** – is slightly different from in-depth interviews which involves one participant at a time, researchers use FGDs to gather data from group participants. "Participants present their own views and experiences as well as hearing from other people" (Finch & Lewis 2013:171). Additional information is obtained in this method because participants listen, reflect, ask questions, seek clarification, comment, hence making the discussion to go deeper. The usage of this data collection method has increased considerably over the last two decades of the twentieth century having originated in the 1920s. Ideally FGDs involve "six to twelve people who may be strangers to each other or drawn from an existing community group" (Laws et al. 2013:204). FGDs are suitable for homogeneous research participants who are either staying in the same place, working in the same institution or location, which was not the case in this study. Therefore, this method could not be employed while collecting data for this study.

(iii) **Questionnaire Method** - This method involves a written list of questions which are given or posted to respondents to answer or fill them in by themselves. They are sometimes pre-coded. In circumstances where the participants have low literacy levels, the questions can be asked verbally, and the answers filled in on behalf of the respondents. Questionnaire method is useful when the study has large numbers of respondents, the researcher knows exactly the kind of data to be collected; "the information is straight forward and can be standardised and when the respondents are literate and comfortable filling in the questionnaires by themselves" (Laws et al. 2013:208). Some of the setbacks of this method is that sometimes the respondents misunderstand the questions and answer wrongly; it may also result in a low response return. This method was employed on the sample sizes with large numbers and "identical questions were asked to all the participants in order to achieve extensive standardisation of the data collection process" (Flick 2011:106).

(iv) **Secondary Documentary Analysis** – In research, documents are treated as sources of research data in their own right and the process of collecting data from them has very

rigorous procedures. Sometimes it goes further by re-analysing already existing data sets and asking new questions out of that which is normally archived. Not all documents required, may be published thus, "it takes the researchers to be patient and persistent to even dig out unpublished but important documents" (Laws et al. 2013:213-215). In this study, this method was mainly employed during literature review and many of the findings were recorded in the third chapter of this report.

(v) **Observation** – This method is employed in most researches since it requires observing what is going on and confirming whether their actions reflect in their actual behaviour. The main objective of this method is to record what has been observed. Observational data is often obtrusive and passive, since it lacks the research participant's involvement. This study could therefore not use this method because it was interested in "attitudes, opinions and motivations of the research participants" that could not be recorded using this method (Zikmund 2003:69).

This study used mainly two data collection methods namely: Interview and survey questionnaire that are explained in the subsections below.

4.8.1 Interviews

In a contemporary world, interviews are one of the most common data collection methods used to "gain knowledge about all kinds of phenomena" (Alvesson 2011:vii). It is normally applied in qualitative research and social sciences. According to Kvale (2013:1), conversation is the basic mode of human interactions and this is all what interviews are about where the interviewer "interacts, poses questions, learns about experiences, feelings and hopes of their research participants". Scholars prefer this method because it generates rich accounts of data and researchers get a chance to have face to face contact with the research participants.

The major strengths or advantages of interviews include: it allows collection of in-depth information where respondents can express the rationale of their actions and feelings; individuals tell their own story in their own way; respondents who are not comfortable in groups can also be involved; and normally people enjoy that rare opportunity of being listened to at length since interviews are repetitive; there is room for improvement with time.

However, interviews also have limitations such as: it is time consuming, laborious and expensive since the researcher meets one respondent at ago; and has difficult analysis, more so for less structured interview data. Interviews may not work well with less confident

researchers or respondents and interviews sometimes "pose a risk of invading people's privacy" (Laws et al. 2013:204).

Though interviews are time consuming, laborious and costly, when conducted on telephone, many of these fears can be allayed. However, the respondents need to have reliable telephone services such that the interviews can be conducted on phone which drastically reduces the costs of travelling and even time consumed. It also allows more confidentiality and anonymity, since the researcher doesn't meet the respondent face to face. The only challenge is that the researcher "may not easily build rapport like in a face to face interview" (Laws et al. 2013:204). This study used both a mixture of face to face and telephone interviews. The face to face was frequent as the researcher wanted to build rapport with the respondents. The telephone was mainly used to fix interview appointments and also follow up questions and clarification after the face to face sessions.

The virtue of interviews is their openness, for example the interviewer can "follow the leads in the interview situation or stick to the interview guide" (Kvale 2013:34). This is technically called the interview structure. There are three structures of interviews: structured, semi-structured and unstructured. In structured interviews, prepared scripts guides the course of the interview covering the topics of the study in a "detailed sequence of questions" (Kvale 2013:56). In contrast, semi-structured interviews is where a researcher follows standard questions but with a few individually tailored questions where probing is used to get more clarification" (Leedy & Ormrod 2010:188). This study used semi- structured interview because it allowed the collection of some quantitative and qualitative information, "questions could be asked in different ways. The semi-structured interviews lasting 20- 30 minutes were used to collect data on staffing for serving SMEs, legal aspects, policy and related regulatory framework, growth and stability of collections on R&I information, availability of the required infrastructure, equipment, and availability of training opportunities among others.

With the unstructured interviews, an interviewer comes up with a broad theme and the researcher is open to taking any unexpected turns. The interviewer is free to define relevant sub-themes or issues as long as s/he "avoids wide departures" (Alvesson 2011:9). This type of interview is mostly a conversation with no standard questions and it can be time consuming, both at the data collection stage and at analysis; therefore, it was not suitable for this study.

4.8.2 Survey Questionnaire

Previously self-completion questionnaires were issued directly by the respondent; sometimes they were posted but today with the advancement of technology, this method is increasingly being done "online if the respondents have reasonable internet access" (Simmons 2012:185). Postal surveys are popular when collecting views from very large populations. The email and internet surveys also follow the standard format of providing pre-coded questions with responses to choose from, using simple language for everyone to easily understand.

The strengths of this method are: its relatively cheap where large groups of people can be reached in a short time; analysis is easier, more so for pre-coded questions; self-administered questionnaires minimises any form of biases that might be caused by the researcher; and many find the ticking of options easy, less laborious and fun.

This study employed semi-structured interview guide and self-administered questionnaire. The semi-structured interview guides composed were used to collect data from the 6 university librarians, librarians in charge of the R&I library units and university IT staff. This gave the study a total of 18 interviews conducted. Interviews can however be costly and time wasting, although the researcher overcame this shortcoming by being as professional as possible. This was done by ensuring that the interviews were conducted within the appropriate time and the cost of 18 interviews was fairly manageable. The university librarians were reached in the university libraries at the university campuses involved in the study (See Appendix B for the format of this tool).

In addition, semi-structured interviews were administered to 6 head librarians in charge of R&I units. They too were reached in the university libraries and the interviews lasted 20-30 minutes. The interview guide was used to collect information on the readiness of staff to serve SMEs with R&I information, required skill levels of library staff members, communication modes, growth and stability of collections on R&I information, skills in repackaging information, availability of the required infrastructure, equipment, how knowledgeable they were, their need for training and the quality of R&I information services among others. The semi-structured interview guide for the head librarians in charge of R&I units is presented in appendix C.

Additionally, semi-structured interview guides were further administered to 6 heads of IT in the universities. They were reached at their offices from the university campus involved in the study. The interview lasted 20-30 minutes. The interview guide was used to collect

information on: ICT driven communication modes, ICT applications that can be used in repackaging R&I information for SMEs, availability of the required ICT infrastructure, equipment, internet connectivity, web access among others. The semi-structured interview guide for IT in universities libraries is presented in appendix D respectively.

In contrast, the survey questionnaire with both closed and open-ended questions was used to collect data from academic staff and postgraduate students. There were challenges related to low response rate and poorly hand-written responses that were overcome by constant follow-up and calling the respondents to clarify aspects that were unreadable.

Departmental staff lists, and graduate student registers were used as sampling frames to identify university agricultural academic staff and agricultural graduate students respectively. The academic staff and post graduate students were reached at the agricultural departments from the university campuses involved in the study. The researcher requested the heads of departments and student class leaders to help in the distribution and collection of the instruments. The filling of the questionnaire took 15-20 minutes of their time. The questionnaire for agricultural academic staff in universities is presented in appendix E, while the questionnaire for agricultural post graduate students is presented in appendix F.

Similarly, self-administered questionnaires were issued to 254 SME respondents. The Yellow Pages business directory was used as a sampling frame and also to locate the physical address, telephone contacts and emails of the SMEs. The filling of the questionnaire took a maximum of 15-20 minutes. Filling the questionnaire in the presence of the researcher greatly helped in giving further clarification on any question. Some respondents from SMEs requested the researcher to help fill the questionnaires on their behalf. In other cases, where they were able to complete the questionnaires themselves, the researcher was to pick them up. The questionnaires were used to collect data on ease of SMEs to access R&I from university libraries, preferred formats, language, SME R&I information needs, satisfaction with other sources of R&I information, ability for SMEs to utilise R&I information for their entrepreneurial activities and decision analysis among others. The questionnaire for agricultural SME respondents in Kampala and the central regions of Uganda is presented in appendix G.

Table 6 is the summary of the different instruments used by the respondents.

Table 6: Respondents and corresponding data collection instruments

S/No	Category of Respondent	Sample size	Data collection instruments
1	University Librarians	6	Interview schedule
2	Librarians in charge of R&I information	6	Interview schedule
3	IT staff	6	Interview schedule
4	Agricultural Academic Staff	124	Self-administered Questionnaire
5	Agricultural Postgraduate Students	425	Self-administered Questionnaire
6	Proprietors of Agricultural based SMEs or their representatives	254	Self-administered Questionnaire
	Total	**821**	

4.8.3 Pretesting Instruments

Piloting or pretesting instruments ensures that questions are made "clearer and the majority of the research participants provide useful information" (Laws et al. 2013:149). A pilot study was carried out at Kyambogo University to test and refine the instruments for librarians, IT staff, academic staff and post graduate students, while Nakawa Division was used to test instruments for SMEs. Five interviews were conducted, and ten questionnaires issued to each category of respondents respectively. Table 7 is the summary of the findings and respective responses accruing from the pilot study.

Table 7: Summary of Pilot study findings and respective responses

S/ No	Research Finding	Results	Response
1	Conducted a Cronbach's Alpha test on all quantitative questions in the 3 questionnaires	Ranged from 0.7-0.9	Considered to be good enough
2	Number of questions often skipped	17	13 Questions rephrased
			4 questions merged
3	Number of questions often misunderstood	9	All 9 questions rephrased to become clearer
4	Number of questions often complained by respondents to be complicated	4	3 questions were rephrased
			1 question was deleted
5	Number of questions often complained by respondents to be unclear	14	7 questions were rephrased
			3 questions were turned into semi-closed ended questions
			4 questions were deleted
6	Timing: Interview for University librarians was taking long to complete	1	Condensed to fit within the 20-30 minutes
7	SME respondents were finding trouble distinguishing between small and medium enterprises	4	Provided foot notes on the tool distinguishing a small enterprise from a medium one

The findings of the pilot study were used to fine tune the questions.

4.10 Data analysis and Presentation

Data analysis is the process of synthesising collected field data with an aim of making sense out of it (Chilisa & Preece 2005:207). The synthesising should be able to show the relationship between the research problem and possible solutions. It should follow "a process of organising the collected data such that it can relate to the research questions of the study" (Laws et al. 2013:65). In this study, both qualitative and quantitative data was generated, and analysed and interpreted differently as indicated in the following sub-sections.

4.10.1 Qualitative Data Analysis

Most scholars conceptually separate data analysis from design, but in qualitative studies the "decision taken at the design stage should directly inform the data analysis" (Maxwell 2005:95). By the end of the data collection process, volumes of field notes, tape recorders, information for documents "must be well arranged to allow easy retrieval and use" (Chilisa & Preece 2005:172). This study employed content analysis, while analysing qualitative data from the volumes of audio recordings and field notes gathered from the field.

Content analysis produces a "relatively systematic and comprehensive summary of the data sets" generated from the data collection exercise (Wilkinson 2011:169). It is based on examination of the data for recurrent instances of some kind which are grouped together by "a coding system which is sometimes called systematic quantitative description" (Wilkinson 2011:170). This study followed the stages highlighted below while analysing the qualitative data gathered as suggested by Maxwell (2005:97).

a) The researcher read the interview transcripts.
b) Listened to interview recordings in preparation for transcription.
c) Wrote notes and memos and developed tentative ideas about the study's categories and relationships.
d) Categorised theoretical concepts using codes. This involved attaching one or more key words to a text segment in order to identify statements in any particular order.
e) Finally drew comparisons between concepts relating them to the main variables of the study (Maxwell 2005:97).

4.10.2 Quantitative Data Analysis

One striking difference between quantitative and qualitative data analysis is that quantitative data analysis starts at the end of data collection, while "qualitative data analysis is tied to data collection and occurs throughout the data collection process" (Chilisa & Preece 2005:172). In this study, huge amounts of quantitative data were collected and it required the use of a "statistical software in order to make it straight forward and extremely subtle" (Laws et al. 2013:66). Standard programmes like Microsoft Excel can carry out basic data analysis and even prepare figures and diagram from the analysed data. Other statistical software include: SPSS, STATA, PSPP, Epi-Info, Kwikstat to mention a few. However, it should be remembered that computers and software are fast, organise huge amounts of data, but "can

never think for anyone" (Laws et al. 2013:268). This therefore means that the manipulation of the data squarely remained incumbent upon the researcher.

Depending on how complex this data was, there were numerous manipulations that were done on the quantitative data in order to present different analysis between the different variables of the study. According to Laws et al. (2013) techniques of quantitative analysis in this study included: -

- **Data Matrix** – Data was arranged in tabular format with rows and columns. Calculations could therefore be carried out following different matrices to explain different phenomena according to the data presented.
- **Coding** – This was the process of turning words into figures. This was easier if the questions were pre-coded. Later the codes were given meaning which could later be used to answer different questions of the study.
- **Summation** – The most common calculation done in quantitative analysis involved the counting of totals, which involved summing up the number of people who answered a question in a certain way. Some scholars call this frequency counts.
- **Percentages** – Quantitative analysis became smarter when numbers were worked out in percentages. These would however be misleading if the total number of respondents were low. Hence, it was only applied when the total numbers of respondents were high or relatively many.
- **Grouped Data** – Sometimes quantitative data was categorised in groups for example like age groups, sex, size of SMEs among others.
- **Statistical data** – There were a number of statistical manipulations that were used to analyse quantitative data. In this study, the statistical procedures employed included; calculating range, mid-range and chi-square test (Easterby-Smith et al. 2008).

In this study, most of these manipulations were used with the help of a specialist statistical package called Statistical Programme for Social Sciences (SPSS) version 23. This programme was chosen because it had capacity of analysing large quantities of data. It was complimented with MS excel to generate high quality tables, graphs and charts. Table 8 is the research questions, research data collection methods and data analysis strategies.

Table 8: Sources of Research Data and their Data Analysis Strategy

S/No	Research Question	Data collection methods	Data Analysis Strategy
1	What R&I information sources and services are provided by university libraries to SMEs in the agricultural sector in Uganda?	Semi-structured Interview schedule	Thematic analysis
2	How is R&I information sources and services re-engineered and disseminated to SMEs in the agricultural sector in Uganda by university libraries?	Questionnaire	Statistical Frequency, Chi Square
		Interview	Thematic analysis
3	What skills and competencies are needed by SMEs in the agricultural sector in Uganda to effectively access and use R&I sources and information services?	Self-administered questionnaires from ASMEs	Percentage distribution
4	What factors and perceptions influence access, adequacy and utilisation of R&I information sources and services by SMEs in the agricultural sector in Uganda?	Self-administered questionnaires from Academic staff, post graduate students and SMEs	Statistical Frequency
		Interview schedule	Thematic analysis
5	What challenges are faced by university libraries in Uganda in providing R&I information sources and services to SMEs in the agricultural sector in Uganda?	Self-administered questionnaires	Percentage distribution
		Interview schedule	Thematic analysis

4.10.3 Validity

Validity is the extent to which an "instrument measures what it is supposed to measure" (Leedy & Ormrod 2010:28). It is the "correctness or credibility of a description and interpretation of an account" (Maxwell 2005:106). A researcher endeavoured to draw meaningful and useful inferences from scores generated from the instruments used in the study.

The researcher therefore ensured that the data collected was valid as it had the following qualities as highlighted by Ritchie and Lewis (2013:274):-

1. The data obtained from the covered sample did not contain any known bias as the selection criteria used included all important and known constituencies.
2. The environment in which data was captured allowed quality questioning, free and full expressions of participants and explored all minority views.

3. The research phenomena were adequately named and labelled well representing the real meanings assigned to the research participants.
4. Sufficient internal evidence was developed for all explanations and interpretations of the data gathered from the field.
5. The research findings were reported and displayed in ways that portrayed the true analytical constructions of the research data gathered from the field (Ritchie & Lewis 2013:274).

4.10.4 Reliability

Reliability is the "consistency with which a measuring instrument yields similar results when the entity being measured has not changed" (Leedy & Ormrod 2010:29). The past use of the instrument should demonstrate "internal consistency" (Creswell, 2009:149). According to Lewis and Ritchie (2013:271) reliability is the key to appraising the soundness of a study and is broadly based on having a clear understanding of "consistency, dependability, ensuring that the study is replicable and rigorous". Fox and Bayat, (2010:145-5) further explain that, acceptable research has to be "valid and reliable, correctly and consistently representing what the data sources provided irrespective of difference in time and place". This study adopted tools already validated in previous related studies. The university students and staff questions were adopted from the LIBQUAL+^{TM} instrument which is already tested and used worldwide (Wei et al. 2005:93), while the SMEs questions were derived from previous tested studies of Ponelis (2011), Okello-Obura (2007) and Mutula (2005).

4.11 Ethical Considerations

It is important to highlight ethical considerations with regard to the research to issue "protection of the research participants" (Maree 2016:44). Researchers need to protect their research participants in a number of ways such as "promoting integrity, developing trust, guarding against misconduct and impropriety" (Creswell, 2009:87). According to Laws et al. (2013:163) sometimes the researcher may not foresee the harm that may occur as a result of their research work, but the respondents often can; thus, it is always good ethical practice to take care of "dull administrative matters like never writing research participant's names and above all keeping the research data secure".

Actually according to Blumer (2012:146) ethics in research is all about "sensitivity to the rights of the research participants". While in the pursuit of the truth about a research phenomenon, it is good to respect human dignity as it impinges upon all scientific research.

Different nations and institutions have published "standards of research code of ethics" (Creswell, 2009:87). For this research, the Gulu Research Ethical Committee (GUREC) and Uganda National Council of Science and Technology (UNCST) (2017) as well as the University of Kwazulu Natal (2014) research code of ethics were followed.

In this study, the researcher wrote to the gatekeepers of the different institutions involved in this study requesting for permission to collect data (See Appendix J). All the gatekeepers positively responded as evidenced on appendix K. Thereafter, the researcher sought ethical research clearance from the Gulu Research Ethical Committee, the Uganda National Council of Science and Technology and the University of Kwazulu-Natal which was subsequently cleared (See Appendix H, I and L).

According to Creswell (2009:88), ethical practices involve "more than merely following a set of guidelines". The researcher has to anticipate and address ethical dilemmas that may arise in the course of the study. In this study, the researcher anticipated the risks of the participants and the vulnerability of some and developed a consent form to sign participants before engaging in the research. There is almost a consensus among all disciplines that research should be carried out on human beings only with their consent (Chilisa & Preece 2005). The informed consent, informs research participants about the overall purpose of the study, "the main features, the design, possible risks and benefits" (Kvale 2013:27-28). It also provided the research participants the freedom to "take part or refuse having been briefed on the nature and purpose of the study" (Bulmer 2012:150). Attached in appendix M is the format of the consent form used in this study.

Other ethical dimensions applied in this study were anonymity and confidentiality. Research participants remained anonymous and their identity was not disclosed; permission was obtained to access research participant's sites; accurate interpretation of research data and avoiding undue intrusion was observed (Laws et al. 2013). In other words, research data identifying the exact source was not reported in this study. The confidentiality was not only observed under the data collection stage, but even the "storage of the data collection instruments, analysis, electronic research data up to the dissemination of the research findings" (Bulmer 2012:152).

Today there has been rampant deceit and lying in the course of the research process. Researchers sometimes tend to use deception, concealment of facts, misrepresentation, and falsifying rare information among others. All these practices are unethical and are highly

condemned by credible research organisations and institutions. In this study, the researcher was under immense obligation to “report the unvarnished truth, most especially in research publications” (Bulmer 2012:154).

4.12 Summary

In this chapter, detailed discussions are highlighted on the research methodology adopted in the study. The post positivism research design is used as a basis to apply a mixed methods approach of both quantitative and qualitative methods. The chapter further described the two analyses of the university libraries and SMEs population. The choice of the sampling procedures, sampling of research elements, study area, data collection procedure and instruments, qualitative and quantitative data analysis, validity, reliability, and the pretesting of instruments were discussed. The research ethics was also explained.

CHAPTER FIVE

DATA ANALYSIS AND PRESENTATION OF FINDINGS

"The person saying it cannot be done should not interrupt the person doing it"
Chinese proverb

5.1 Introduction

Data analysis is a process of structuring and bringing order and meaning to data collected in the field (Rossman & Rallis 2017). the analysis of data collected through the questionnaire and interview were condensed and presented in several formats like charts, graphs, and narration to ease its interpretation and also give theoretical meaning to the research findings (Neuman 2011). This study sought to investigate the management and dissemination of agricultural research and innovation information in Ugandan university libraries for small and medium enterprises (SMEs) in the agricultural sector. The study specifically investigated how this agricultural research and innovation (R&I) information is generated by the agricultural academic staff and agricultural graduate students of the six Ugandan universities.

The study addressed five research questions: (i) What are the R&I information services provided by university libraries to SMEs in the agricultural sector in Uganda? (ii) How can the R&I information sources and services in university libraries be re-engineered to serve SMEs better? (iii) What skills and competencies are needed by SMEs to effectively access and use R&I sources and information services? (iv) What factors and perceptions influence access and utilisation of R&I information sources and services by SMEs? (v) What challenges are faced by university libraries in providing R&I information sources and services to SMEs?

The chapter discusses the demographic profiles of respondents that include: gender, age, level of education and sizes of the SMEs. Selected variables were statistically tested to establish whether or not there is any correlation between them and the knowledge of respondents on the management and dissemination of R&I agricultural information for agricultural SMEs.

5.1 Demographic Information

The study sought to establish the different demographic information relating to the respondents involved in the study.

5.1.1 Response Rate

This study targeted a total number of 846 respondents as per its sample size highlighted in the previous chapter. The researcher however managed to collect data from 694 respondents therefore giving the study an 82% response rate which statistically is representative enough. The goal of any researcher is to attain a response rate which is equal or higher than 60% for a study to be considered valid, reliable, and free of bias (Fincham 2008). Table 9 shows the summary of the response rate broken down among the different categories of respondents.

Table 9: Showing a summary of the study's response rate

S/No	Category of Respondent	Sample size	Response rate	% Response rate
1	University Librarians	6	6	100%
2	Librarians in charge of R&I information	6	6	100%
3	IT staff	6	6	100%
4	Agricultural Academic Staff	129	78	60%
5	Agricultural Postgraduate Students	445	367	82%
6	Proprietors of Agricultural based SMEs or their representatives	254	231	91%
	Total	**846**	**694**	**82%**

5.1.2 Gender of respondents

In this study, there were more male (472, 68%) than female (222, 32%) respondents. This result reflected the composition of the different categories of respondents involved in the generation, management and use of R&I agricultural information. Apart from the category of university librarians, there were more men involved in this study than women as depicted in Table 10. The greater number of men in this study explains the gender imbalance still existing in different scientific disciplines like agriculture and the need for more women empowerment in this area, both in postgraduate agricultural studies and in scientific agricultural practice in the market place.

Table 10: Gender distribution of respondents

S/No	Category of Respondent (n=694)	Male		Female	
		Frequency	Percentage	Frequency	Percentage
1	University Librarians	1	16%	5	83%
2	Librarians in charge of R&I information	5	83%	1	16%
3	IT staff	5	83%	1	16%
4	Agricultural Academic Staff	56	72%	22	28%
5	Agricultural Postgraduate Students	261	71%	106	29%
6	Proprietors of Agricultural based SMEs or their representatives	144	62.3%	87	37.7%
	Total	**472**	**68%**	**222**	**32%**

5.1.3 Age Profiles of Respondents

The age of respondents of this study reveals that apart from university librarians and IT staff, (548, 78.9%) of the respondents were between the ages of 20-40 years, 130 (18.7%) respondents were between the ages of 41-60 years and lastly 16 (2.3%) respondents were above 60 years as detailed in Table 11. This statistic seems to demonstrate youthful population of Uganda.

Table 11: Age distribution of the study's respondents (n=694)

S/No	Category of Respondent (n=694)	20-40 years	41-60 years	Above 61 Years
1	University Librarians		5	1
2	Librarians in charge of R&I information	3	3	
3	IT staff	2	4	
4	Agricultural Academic Staff	40	26	12
5	Agricultural Postgraduate Students	311	56	
6	Proprietors of Agricultural based SMEs or their representatives	192	36	3
	Total	**548**	**130**	**16**

5.1.4 Level of Education of Respondents

The respondents' levels of education indicate that most of the respondents (455, 65%) were degree holders. This was interesting to note because even among the SME respondents, 151 (54%) were graduates. The least number of respondents were only 5 (0.7%) primary school leavers. The study did not find any illiterate respondent as indicated in Table 12.

Table 12: Education qualifications of respondents involved the study (n=694)

S/No	Category of Respondent (n= 694)	Primary	Secondary	Certificate /Diploma	BA/BSc	PGD	MA/ MSc	PhD
1	University Librarians						3	3
2	Librarians in charge of R&I information				3		3	
3	IT staff				2		3	1
4	Agricultural Academic Staff				6	4	46	22
5	Agricultural Postgraduate Students				319	1	47	
6	Proprietors of Agricultural based SMEs or their representatives	5	13	48	125	8	27	5
	Total	**5**	**13**	**48**	**455**	**13**	**129**	**31**

5.1.5 Distribution of Respondents in the Universities Surveyed

A total number of six universities were involved in the study. The respondents who were interviewed were fixed, but those who were issued with questionnaires differed across the different universities. As indicated in Table 13, the highest number of respondents were from Makerere University and the least number was from Ndejje University.

Table 13: Cross tabulation of Universities Surveyed (n=445)

S/No.	Institution	Academic Staff			Graduate Students		
		Frequency	Percent	Cumulative Percent	Frequency	Percent	Cumulative Percent
1	Makerere	40	51.3	51.3	300	81.7	81.7
2	Kyambogo	13	16.7	67.9	14	3.8	85.6
3	Gulu	9	11.5	79.5	20	5.4	91.0
4	UMU	6	7.7	87.2	11	3.0	94.0
5	Ndejje	3	3.8	91.0	9	2.5	9.5
6	UCU	7	9.0	100.0	13	3.6	100
	Total	**78**	**100.0**		**367**	**100.0**	

5.1.6 SME Sizes

The SME respondents were asked to indicate the size of their enterprises. Findings from the study show that most (178, 77.1%) enterprises were small, while 53 (22.9%) enterprises were medium. Figure 11 shows the comparison.

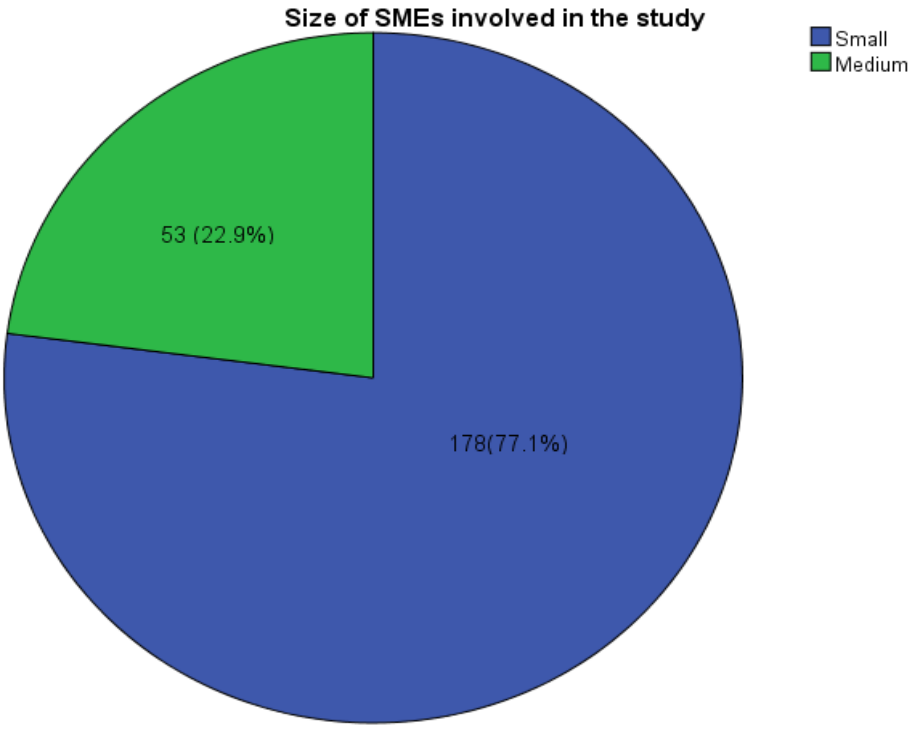


Figure 11: Sizes of the enterprises involved in the study (n=231)

In order to ascertain the mortality rate of Agricultural SMEs in the central regions, the researcher asked participants to indicate how long they had been in operation and the results are reflected in Figure 12.

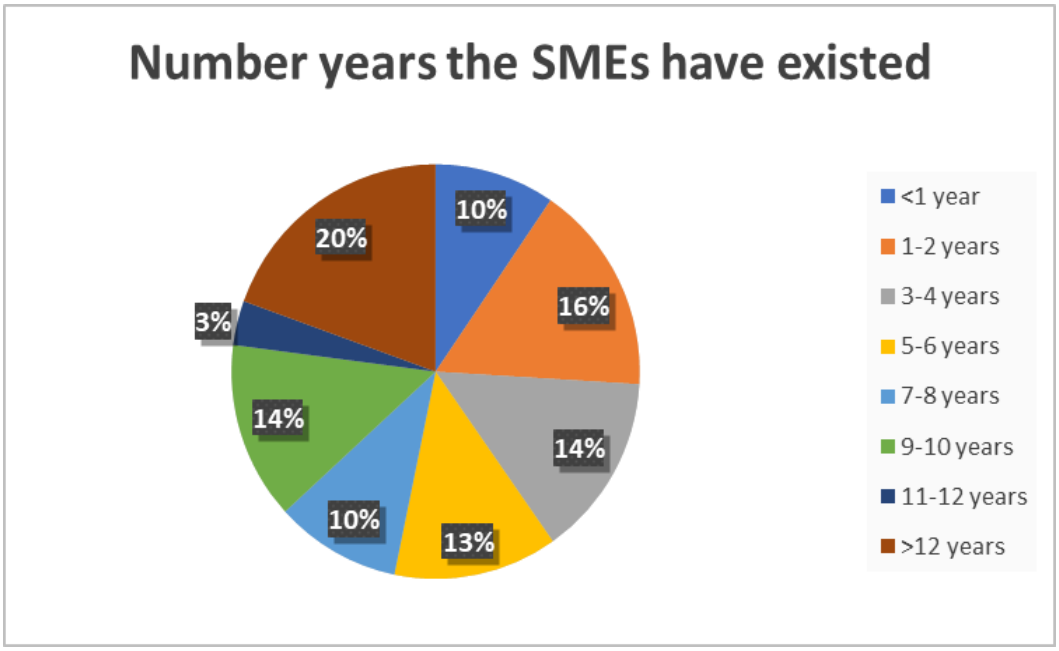


Figure 12: Number of years the SMEs had existed (n=231)

As illustrated in Figure 12 above, the period SMEs have been in operation is fairly distributed. Contrary to popular belief (Uganda Bureau of Statistics 2011), the highest number of agricultural SMEs (45, 20%), have been in operation for more than twelve years. This is followed by 38 SMEs (16.5%) which have existed for 1-2 years. Interestingly, the smallest number of SMEs (8, 3.5%) have existed for 11-12 years.

5.2 Management of R&I Information in University Libraries

The study sought to assess the management of the research and innovation information in university libraries in Uganda. This was in response to the study's first research question that sought to know the R&I information sources and services provided by Ugandan universities for SMEs. The Libqual^{+TM} theory and Wilson's 1999 model of information seeking behaviour were used to frame the responses got from this question. The focus of the question was on different dimensions such as generation of R&I information by the academic staff and graduate students, library systems, the conduciveness of the library spaces, employee relations, among others. The findings are presented in the following sections.

5.2.1 University Libraries Information Sources

Wilson's 1999 model states that information users seek information from both formal and informal sources. Thus, the researcher wished to establish whether the university libraries were formal sources of R&I information for SMEs. The agricultural academic staff and graduate agricultural students were asked whether the research they were doing was able to

benefit or meet the entrepreneurial information needs of SMEs. The results showed that over 78.2 % of both the academic staff and students indicated that their research could meet the SME R&I information needs. No academic staff felt that their research could not meet SME R&I information needs; 13% of the graduate students felt that their research could not meet SME R&I information needs. Table 14 below illustrates the results.

Table 14: How Research by University Academic staff and graduate students meets the R&I information needs of SMEs (n=445)

S/No.	Potential of research meeting SME R&I information needs	Academic Staff		Graduate Students	
		Frequency	Percent	Frequency	Percent
1	Yes	61	78.2	287	78.2
2	No			48	13.1
3	I do not know	15	19.2	32	8.7
4	Sub total	76	97.4	367	100
5	Missing	2	2.6		
	Total	**78**	**100**	**367**	**100**

Among those who stated yes, the researcher went ahead to ask them to give examples of the different SME information needs their research would meet; below were their responses. Both categories of academic staff and graduate students stated that their research would highly contribute to increasing the productivity of SMEs (25.7% & 22.9% respectively), identification of training (10.5% & 15.1% respectively) and identifying investment opportunities (13.6% & 9.2% respectively). The least contribution was to help in the application of credit for SMEs (4.2% & 3% respectively) as indicated in Table 15.

Table 15: How Research being generated contributes to SMEs R&I information needs (n=445)

S/No.	Type of R&I Information needs met by the research	Academic Staff		Graduate Students	
		Frequency	Percent	Frequency	Percent
1	Starting up new business enterprises	20	10.5	127	13.8
2	Enhancing business growth	18	9.4	121	13.1
3	Licensing	12	6.3	26	2.8
4	Increasing productivity	49	25.7	211	22.9
5	Increasing sales	18	9.4	102	11.1
6	Enhancing export trade	8	4.2	52	5.6
7	Identifying of training opportunities	20	10.5	139	15.1
8	Application of Credit	8	4.2	28	3
9	Identification of investment opportunities	26	13.6	85	9.2
10	Application of Patents and trademarks	12	6.3	30	3.3
	Total	**191**	**100**	**921**	**100**

a. Dichotomy group tabulated at value 1

From Table 15 above, the three leading benefits SMEs would obtain from the research done by the respondents of this study were: increase in the productivity of the businesses of the SMEs (25.7% & 22.9% respectively); identify training opportunities SMEs (10.5% & 15.1% respectively); and give them ideas of starting up new businesses (10.5% & 13.8% respectively). An example of university research that could increase productivity or identify new investment opportunities is the MV Mulimi project presented in Figure 13.

Figure 12: MV Mulimi – A low cost tractor for small scale farming

MV Mulimi is a low-cost multipurpose tractor invented by the agricultural staff and students of Makerere University. It is far cheaper than the imported tractors and can do many of the functions of a conventional tractor such as ploughing, transporting produce, irrigating, and pumping water among others. This is one of the examples of the innovations done in universities that can benefit Small and Medium Enterprises in the agricultural sector in Uganda.

In another private university, a female university librarian had this to say;

> *"This university has a big budget for research which is managed by the school of post graduate studies. They are encouraging academic staff members to engage in innovative research as opposed to the traditional research. As a result of this, the Faculty of Agriculture has tried to respond to this call because during last year's exhibition, they had many innovative products they show-cased which I know can be beneficial to SMEs in the agricultural sector."*

Though most respondents believed that academic staff and graduate students generate a lot of action research that can be beneficial to SMEs, one systems librarian was sceptical. On a scale of 1-10, he rated the research done in universities at only 2. In other words, only 20% of this research qualifies or can benefit the SMEs; he gave the following reasons:

> *"It is true a lot of research is done in universities but most of it is not meaningful and does not solve societal problems. I judge this by the kind of works they upload on the institutional repository. Starting with graduate students, most of them conduct their research purely for academic purposes so as to complete their course and attain their degrees. As for the academic staff, 70% of them are part time lectures who never conduct any research or get research funding. The remaining 30% who are permanent staff are overloaded with teaching and find no time for research. It is only a few who win research grants but also carry out research to meet the donor needs instead of solving local problems in the society. On the outside they truly engage the communities but at the end of the day such research rarely leads to any progress."*

5.2.2 University Libraries R&I information services

Under the assessment of university library R&I information services, the researcher investigated three main aspects that include library employee relations, library systems and library as a place based on the Libqual+™ three dimensions of service affect, information control and library as a place. The respondents were asked to assess the employee relations using a Likert scale of five ranging from very good, good, fair, poor to very poor. Below are their assessments.

5.2.2.1 Assessment of the Quality of University Library Employee Relations

Under this assessment, the academic staff were asked to evaluate the university library employee relations and rate how these instil confidence in the users they serve. This was in line with the LibQUAL+™ model, under the service affect dimension which focuses on user expectations. It was established that 44.9% of the respondents found it fair, while 42.3% of the respondents felt it was good. Only 7.7% of the respondents felt that they were very good. None of the respondents felt that the library employees were poor or very poor at instilling confidence in users as indicated in Figure 14.

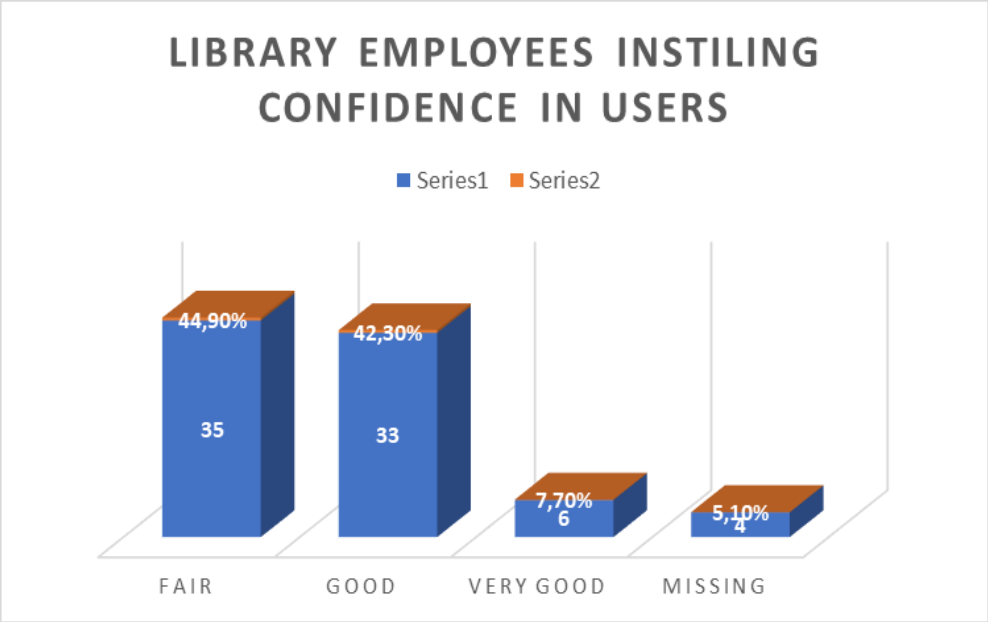


Figure 13. Assessment of how library employees instil confidence in users (n=78)

The results depicted in Figure 14 show most respondents rated the variable of librarians instilling confidence in users as fair and good. One respondent commented particularly on the area of research information in university libraries:

> *"Librarians in the university work with researchers mainly in the area of helping them in reference services. Unfortunately, the librarians have not so much been involved in the entire research life cycle, that's why most of them think that research must end up into publications. There is therefore need to equip the librarians with knowledge on how research data can be reused and disseminated to the right audience who can convert this information into innovations and commercial products. Definitely this will take librarians who can instil confidence in the businessmen who have to be convinced to risk their financial resources and inject them in R&I information for commercial purposes." (Male, Head of R&I unit)*

The study also wished to establish the rate at which the university library employees give individual attention to the users. The results obtained from the library staff showed that over 73% of the respondents rated them to be good, 24% of the respondents rated them to be fair, while only 3% of the respondents found them to be very good. In addition, none felt that they were poor or very poor at giving individual attention as illustrated in Figure 15.

Figure 14: Assessment of how library employees give individual attention to users (n=78)

The academic staff were further requested to assess the effectiveness with which university library employees respond to users' questions. The results are presented in figure 16.

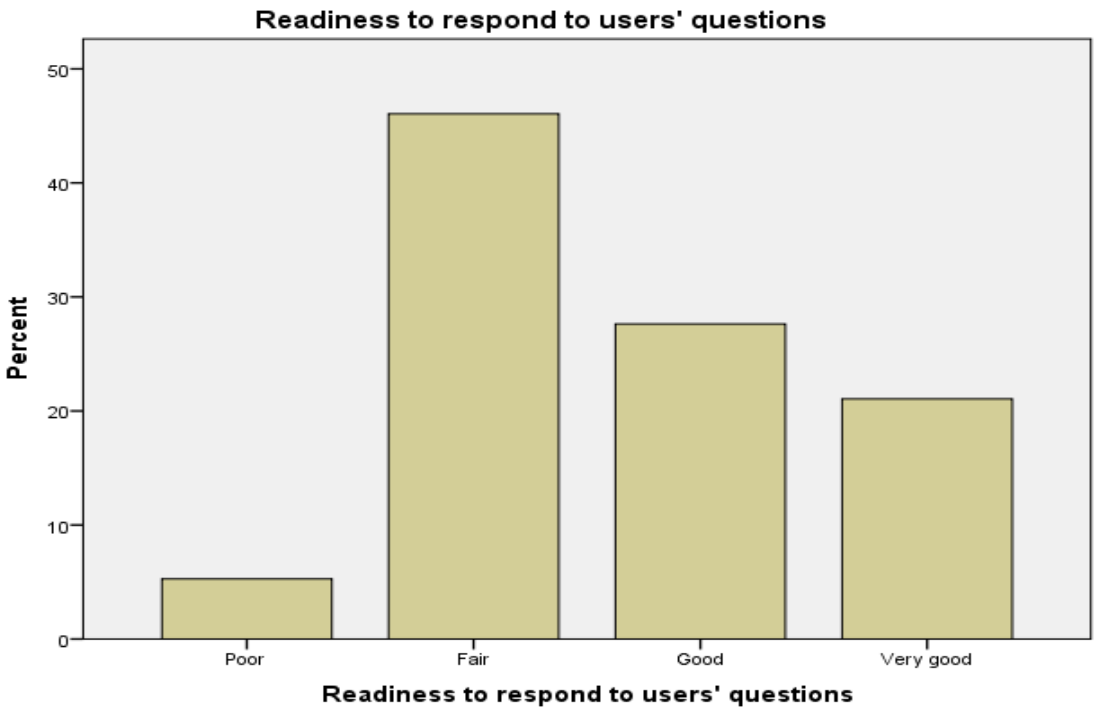


Figure 15: Assessment of library employees effectiveness in responding to user's questions (n=78)

As shown in figure 16, the highest number of respondents (44.9%) rated the effectiveness as fair, 26.3% of the respondents noted it was good, 23.7% of the respondents felt it was very good and 5.1% of the respondents felt that the library employees' response to user questions was poor. During the interviews, one interviewee from a private university was proud to note that:

> *"I have displayed my phone contact on the noticeboard, if any user is looking for anything and has failed to trace it, they can call me and I find a way of helping them or refer them to the appropriate technical person. It is not only me but it was agreed by the library management that all heads of sections should display their phone numbers in strategic locations such that users can easily call them for any help they might need. Furthermore, those who may not feel comfortable calling, a registration book has been placed at enquiries where users can register any complaint or query and such complaints or questions are attended to as soon as possible." (Male head of R&I Library Unit)*

Figure 17 is an illustration of a sign post in one public university library inviting library users to ask questions to librarians.

Figure 16: A notice in the library encouraging users to ask the library employees.

5.2.2.2 Assessment of University Library Systems

This study sought to know the ease with which library users find print and journal collections in the library where most of R&I information is packaged. This was in line with the LibQUAL+^{TM} model, under the information control dimension which focuses on user's information needs. The results revealed that 148 (40.3%) graduate students felt that R&I information in print and the journal university library collections was fairly easy to access; 103 (24.5%) of them felt that the ease of accessibility was good; 16 (4.4%) felt it was very good and a few of them (10, 2.7%) felt that the accessibility was very poor as illustrated in the Table 16.

Table 16: Ease of accessing print and electronic journal collections (n=367)

n=367		Frequency	Percent	Cumulative Percent
Valid	Very poor	10	2.7	2.7
	Poor	90	24.5	27.2
	Fair	148	40.3	67.6
	Good	103	28.1	95.6
	Very good	16	4.4	100.0
	Total	367	100.0	

The respondents who comprised graduate students were asked to indicate whether the university library systems help them to stay abreast with the current trends in their fields of interest. This assessment used a five-level scale of strongly disagree, disagree, undecided, agree and strongly agree. The highest number of respondents (172, 46.9%) stated that they agree; second to them were those who strongly agreed and those who were undecided both scoring 62(16.9%). Slightly less respondents (44, 12%) disagreed, while 27(7.4%) respondents strongly disagreed. Table 17 presents the results.

Table 17: How the Library helps respondents stay abreast with their field of interest (n=367)

n=367		Frequency	Percent	Cumulative Percent
Valid	Strongly disagree	27	7.4	7.4
	Disagree	44	12.0	19.3
	Undecided	62	16.9	36.2
	Agree	172	46.9	83.1
	Strongly agree	62	16.9	100.0
	Total	367	100.0	

The researcher wanted to further understand whether the university library aids the graduate students in pursuing their academic dreams. More than half of the respondents (224, 61%) agreed that the library aided their professional academic advancement; another 77 (21%) strongly agreed. A few of them (30, 8.2%) were undecided and (36, 9.8%) disagreed to the statement that the university library aids their professional academic advancement. None strongly disagreed as indicated in Table 18.

Table 18: Library aids my professional academic advancement (n=367)

n=367		Frequency	Percent	Cumulative Percent
Valid	Disagree	36	9.8	9.8
	Undecided	30	8.2	18.0
	Agree	224	61.0	79.0
	Strongly agree	77	21.0	100.0
	Total	367	100.0	

The respondents who were graduate students were further asked whether the library enables them to evaluate trustworthy R&I information. Slightly more than a quarter of the respondents (106, 28.9%) were undecided; slightly more than a quarter (103, 28.1%) agreed, but another 80 (21.8%) of the respondents disagreed. Those who strongly agreed with the statement were 64 (17.4%) and those who strongly disagreed were only 14 (3.8%) respondents as shown in figure 18.

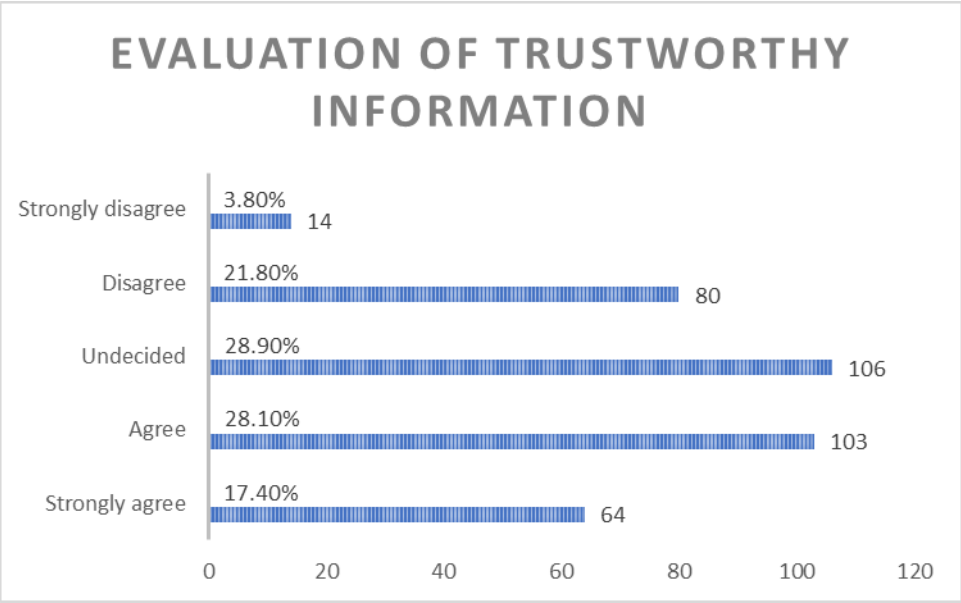


Figure 17: Assessment of the university library in helping users evaluate information (n=367)

From the interview with one systems librarian, he mentioned that:

> *"Many library users and researchers do not know how to evaluate the information they access from the library. We are now teaching them to use Libhub, which among other things has helped us to collect all our books, book chapters, catalogues, thesis, and journal articles under one interface. It is indeed an effective discovery tool. After that we tell them to use another tool called subject plus which helps users to categorise all those collected resources according to relevance. By the end of the day it helps our users to automatically evaluate the discovered resources even before downloading them."*

Libraries are supposed to occasionally train their users and equip them with skills of easily accessing R&I information. The graduate students were asked to ascertain whether the library equips them with the necessary skills of using the library. From the findings it was clear that 201 (54.8%) respondents agreed that the library provided them with information skills training for their work, while 36 (9.8%) respondents strongly agreed. A sizeable number of respondents (58, 15.8%) were undecided. Additionally, 48 (13.1%) of the respondents disagreed and 14 (3.8%) respondents strongly disagreed. The results in figure 19 depict the results.

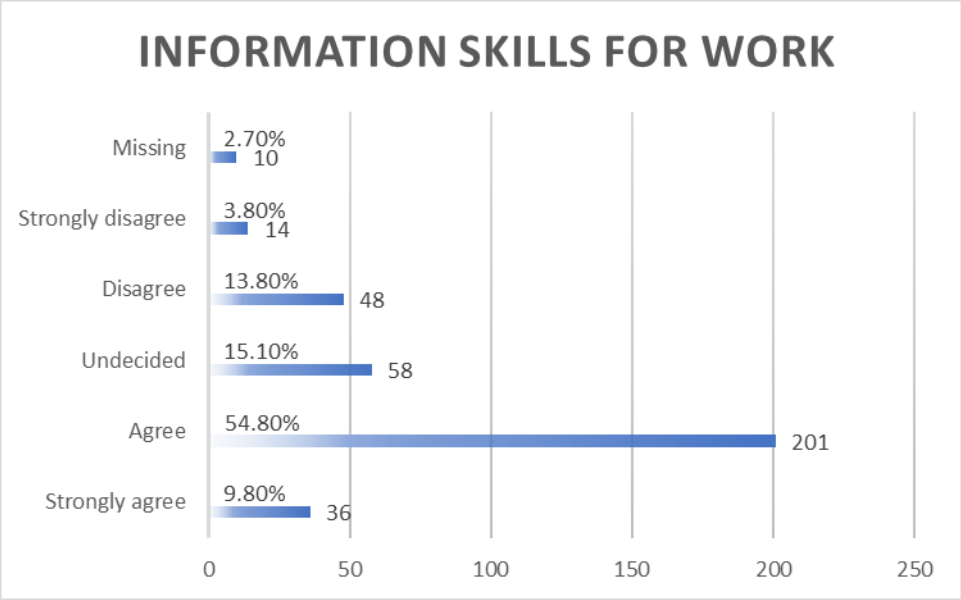


Figure 18: Assessment of how University Libraries provide users with information skills training (n=367)

Since the university library web page is the face of library systems, the researcher wished to find out how often the respondents accessed R&I information as well as other resources through this webpage. This assessment used a five point Likert scale measure: All the time, Daily, Occasionally, Rarely and Never. The statistics of this assessment were sparsely distributed as 129 (35.1%) of the respondents stated that they accessed the library web page occasionally, 102 (27.8%) respondents accessed it rarely and 40 (10.9%) respondents had never used it. There was a handful of 64 (17.4%) respondents who accessed it daily and another 22 (6%) respondents who accessed it all the time. Figure 20 presents the detailed results.

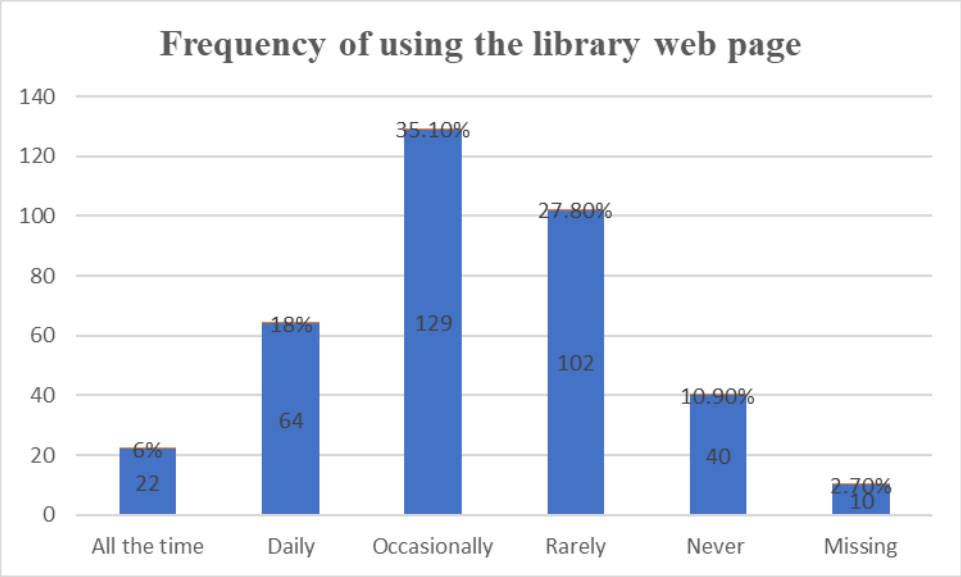


Figure 19: Frequency of accessing resources through Library webpage (n=367)

Having established the usage of the library web page, the study sought to find out how often the respondents used non-library gate ways like Google and Yahoo to access R&I information. The results revealed that 204 (55.6) of the respondents stated that they used them all the time, 133 (36.2%) used non-library gateways daily, 14 (3.8%) used them occasionally and just 2 (0.5%) have never used them. Figure 21 below illustrates the results.

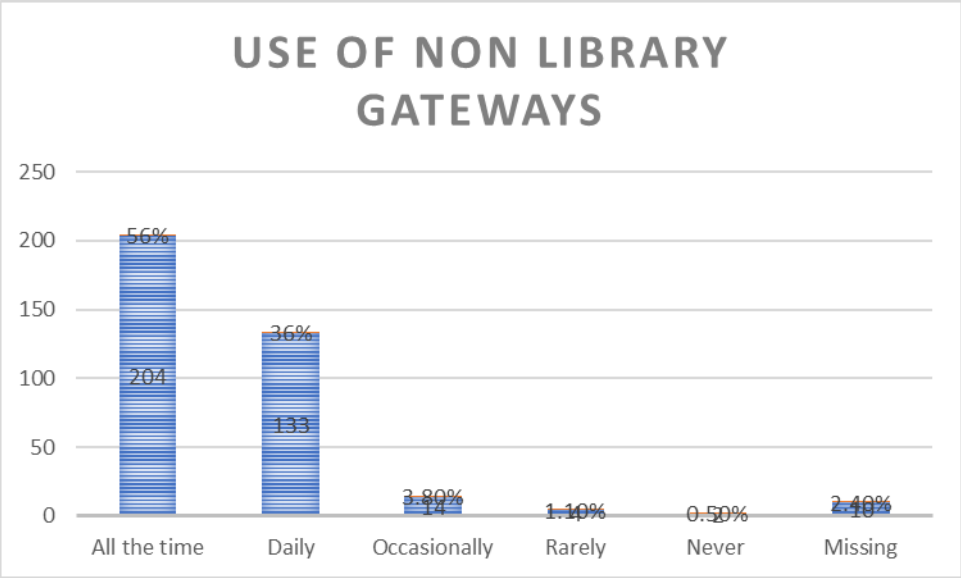


Figure 20: Frequency respondents use non-library gateways (n=367)

5.2.2.3 Assessment of University Libraries as a Place

The researcher was interested to know how the University library as a place inspired the users as far as studying and learning was concerned. This was in line with the LibQUAL+™ model, under the library as a place dimension which focuses on the quality of library spaces. These opinions were sought from graduate students. The results showed that the highest number of respondents (153, 41.7%) felt that the university library spaces were fairly inspiring them to study and learn, 92 (25.1%) of the respondents felt that they were good, almost close to a quarter of them (80, 21.8%) felt that they were very good, 30(8.2%) respondents were of the view that the library spaces were poor and 12(3.3%) rated them very poor as far as inspiring the users in studying and learning is concerned. The results are shown in Table 19.

Table 19: How University Library spaces inspire studying and learning (n=367)

Rate at which library space inspire studying	Frequency	Percent
Fair	153	41.7
Good	92	25.1
Very good	80	21.8
Poor	30	8.2
Very poor	12	3.3
Total	**367**	**100**

The Figure 22 illustrates the ambiance in one public university library surveyed.

Figure 21. A portion of Barclays library space at Kyambogo University

Libraries need to be quiet places to enable the users to concentrate, while reading or studying. This study sought to know from respondents whether they found university libraries as quiet places for individual study. According to the graduate students who desire such a space for reflective study and research, 127 (34.6%) of them felt that the university libraries were fairly quiet places for individual study, 102 (27.8%) of the respondents were of the view that the quietness at the university library was good, 76 (20.7%) respondents found it very good. Similarly, 50 (13.6%) respondents rated the quietness at the university library poor and 12(3.3%) rated it extremely poor. Based on the cumulative percentage, the views of those who rated it good and very good is 48.5% which is almost half of the respondents, while those who felt that it was poor and very poor is 19.9% which is a fifth of the respondents. The results in Table 20 presents these results.

Table 20: Assessment of the Library as a quiet place for individual study (n=367)

Assessment of library as quiet for individual study		Frequency	Percent	Cumulative Percent
Valid	Very poor	12	3.3	3.3
	Poor	50	13.6	16.9
	Fair	127	34.6	51.5
	Good	102	27.8	79.3
	Very good	76	20.7	100.0
	Total	**367**	**100.0**	

Despite the fact that university libraries need to have quiet places for users to concentrate while reading or studying, they also need designated places for loud communication and group study. This study therefore sought to know from respondents whether university libraries had adequate spaces for group study and learning. According to the graduate students who desire such a space for discussions, group presentations and discussions, 104 (28.3%) of them felt that the university libraries' group study spaces were poor; 93 (25.3%) respondents were of the view that these spaces were fair; and 90 (24.5%) respondents found them to be good. On the other hand, 32 (8.7%) rated them very good and 48(13.1%) rated them extremely poor. This is a point of concern because, if the views of those who rated them good (24.5%) and very good (8.7%) are merged, a result of 33.2% is obtained which is far small compared to the merged views of those who felt that these spaces were poor (28.3%) and very poor (13.1%) which is 41.4%. The results in Table 21 is a representation of these views.

Table 21: Assessment of the library as a space for group learning and study (n=367)

Assessment of space for group learning		Frequency	Percent	Cumulative Percent
Valid	Very poor	48	13.1	13.1
	Poor	104	28.3	41.4
	Fair	93	25.3	66.8
	Good	90	24.5	91.3
	Very good	32	8.7	100.0
	Total	**367**	**100.0**	

For library patrons to keep coming back to the library, they must find it comfortable and inviting. Therefore, this study sought to establish whether the graduate students found the library comfortable and inviting. Most of them (129, 35.1%) rated the comfort in university libraries as good; 118 (32.2%) respondents found it to be fair; 54 (14.7%) rated it very good; 52 (14.2%) rated it poor and 14 (3.8%) rated it very poor. The results are shown in Table 22.

Table 22: Assessment of libraries as comfortable and inviting places (n=367)

Assessment of Comfort		Frequency	Percent	Cumulative Percent
Valid	Very poor	14	3.8	3.8
	Poor	52	14.2	18.0
	Fair	118	32.2	50.1
	Good	129	35.1	85.3
	Very good	54	14.7	100.0
	Total	367	100.0	

With regard to the university library being a comfortable and inviting place. a female university librarian said, “We strive to change the image of our university not only to be seen as a university library, but also as a community library and as a result we reduced our charges of external users to Shs 1000 per day ($0.3) and Shs 20,000 per year ($5.5)”.

The researcher further investigated the quality of the service from both graduate students and academic staff. From the graduate students, the highest number (134, 36.5%) rated the service fair; 103(28.1%) rated it good; and 54(14.7%) rated it very good. On the other hand, 60 (16.3%) felt it was poor and 16 (4.4%) of them believed it was very poor. The results are presented in table 23.

Table 23: Assessment of the library as a gate way for research and innovation (n=367)

Graduate student's assessment of the library as a gateway for research and innovation		Frequency	Percent	Cumulative Percent
Valid	Very poor	16	4.4	4.4
	Poor	60	16.3	20.7
	Fair	134	36.5	57.2
	Good	103	28.1	85.3
	Very good	54	14.7	100.0
	Total	**367**	**100.0**	

When this same question was paused to the academic staff, the highest number (31, 39.7%) rated the university R&I service as fair; 28 (35.9%) felt it was good and 13 (16.7%) felt it was very good. None felt it was poor, but 6 (7.7%) felt it was very poor. The results are presented in Table 24.

Table 24. Assessment of the Library as a gateway for research and innovation by academic staff (n=78)

Academic staff's assessment of the library as a gateway for research and innovation		Frequency	Percent	Cumulative Percent
Valid	Very poor	6	7.7	7.7
	Fair	31	39.7	47.4
	Good	28	35.9	83.3
	Very good	13	16.7	100.0
	Total	**78**	**100.0**	

When the statistics in the two preceding tables are compared, a pattern emerges that in both categories of respondents, most of them rated the libraries R&I services either good or very good. The graduate students who felt that these services were good and very good were 52.6%, more than half, while the academic staff were 42.8%, almost half. This can be evidenced in the percentages in Table 25.

Table 25: Cross tabulation of the assessment of the Library as a gateway for research and innovation by academic staff and graduate students

S/No.	Rating of University libraries as a gate away for research and innovation	Academic Staff		Graduate Students	
		Frequency	Percent	Frequency	Percent
1	Very poor	6	7.7	16	4.4
2	Poor			60	16.3
3	Fair	31	39.7	134	36.5
4	Good	28	35.9	103	28.1
5	Very Good	13	16.7	54	14.7
	Total	**78**	**100.0**	**367**	**100.0**

The researcher wished to know how satisfied the respondents were with the way they were treated in the library. The results showed that over half of them (193, 52.6%) agreed that they were satisfied with the way they were treated in the library; 32 (8.7%) respondents strongly agreed; 52 (14.2%) were undecided; 88 (24%) of them disagreed and very few of them (2, 0.5%) strongly disagreed as indicated in the Figure 23.

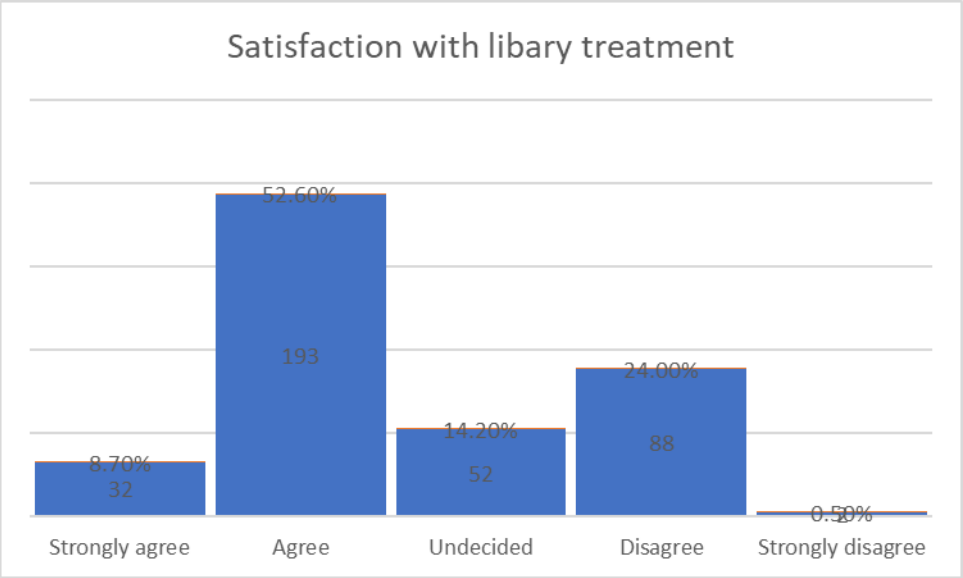


Figure 22: Respondent's satisfaction with the way they are treated in the library (n=367)

The researcher felt it appropriate to know whether the respondents were satisfied with the university library's support to learning and research. Slightly less than half of the respondents (160, 43.6%) agreed that they were satisfied with the library's support for learning and research, 73 (19.9%) strongly agreed and a few of them (48, 13.1%) were undecided. Those

who disagreed with the statement were 68 (18.5%) and 18 (4.9%) strongly disagreed as displayed in Figure 24.

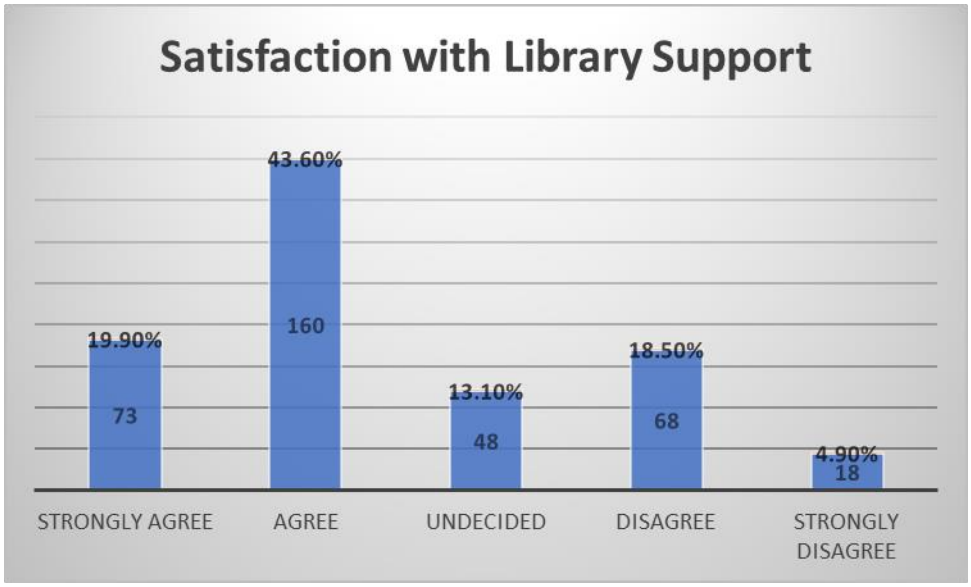


Figure 23: Respondents' Satisfaction with library support for learning and research (n=367)

The researcher also wished to get the respondents views on the general quality of the university library service. As seen in Figure 25, the majority (160, 43.6%) felt that the general university library service was fair, 113 (30.8%) rated it good and 60 (16.3%) felt it was very good. In addition, 18 (4.9%) respondents were not convinced and they rated it poor and 8(2.2%) respondents went to the extreme and rated it very poor.

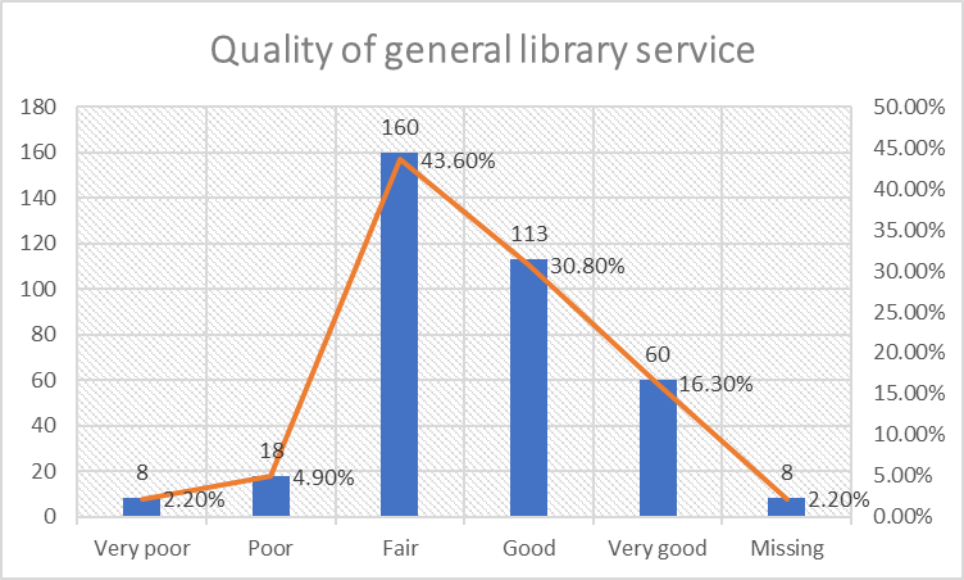


Figure 24: Assessment of the general quality of library service (n=367)

5.2.3 The Value of Serving SMEs with R&I Information

The researcher wished to know the value the key university officials attached to this idea of university libraries serving SMEs with research and innovation information which is collected and stored in these libraries. Those interviewed were asked to declare the value or their attitude towards university libraries serving SMEs with their R&I information. The results are presented in Table 26.

Table 26: The value University libraries attach to serving SMEs with R&I information(n=18)

S/No.	Value	Rate	Percentage
1	High /Positive	14	78%
2	Undecided	1	6%
3	Low/Negative	3	16%
	Total	**18**	**100**

From the results in table 25 above, the highest number of interviewees (14, 78%) had a high or positive value toward the idea of university libraries serving SMEs with R&I information, 1 (6%) was undecided and 3 (16%) had a low or negative attitude towards same. One respondent noted:

> *"Indeed a lot of research is done by academic staff and graduate students, all of this is kept in the library, but the information that trickles down to SMEs is really very minimal, and the marketing for this information among the SMEs is not effectively being done." (Female, IT University staff)*

Similarly, SMEs were asked to indicate whether they consider university libraries as formal sources of R&I information that can be used to boost their business enterprises. The results are presented in Figure 26.

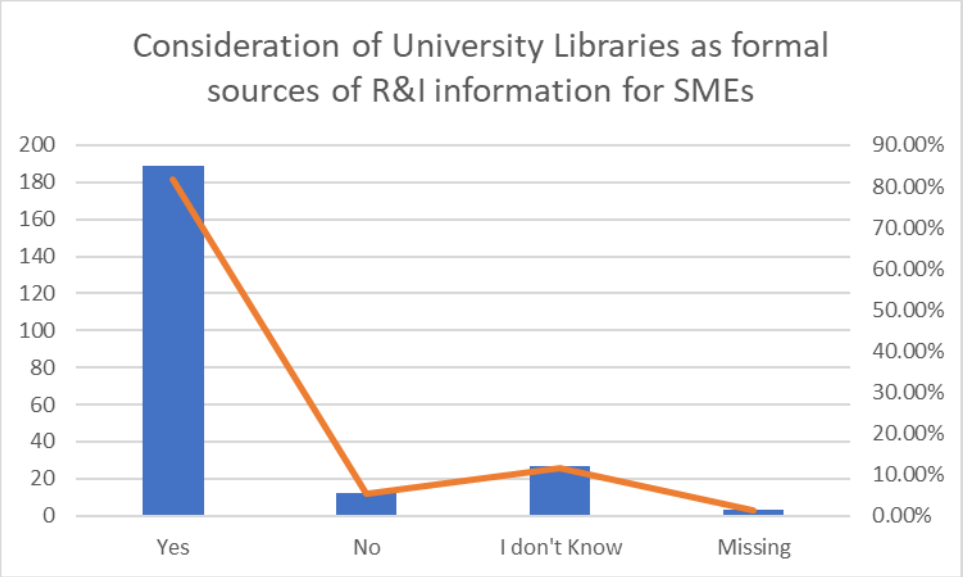


Figure 25: How SMEs consider university libraries as formal sources of R&I information for their business enterprises (n=231)

It is interesting to note that the majority (189, 81.8%) of the SMEs respondents were excited about this idea and only 12 (5.2%) were against it. Moreover, 27 (11.7%) did not know what to say. For the respondents who indicated that university libraries can be formal sources of R&I information, they were further asked to explain why or to give examples how university libraries can be their formal sources of this priceless information. The results are provided in Table 27.

Table 27: How University Libraries are expected to be formal sources of R&I information for SMEs (n=189)

S/No.	Reasons why ULs should be formal sources of R&I information for SMEs	Frequency	Percent
1	A lot of R&I information is generated but shelved	41	21.8
2	Can be modified to provide practical solutions	33	17.6
3	Can improve quality of service delivery	32	16.9
4	Incubation and laboratory experiment testing services	20	10.6
5	They are knowledgeable and carry out a lot of agricultural research	17	8.9
6	They generate a lot of new ideas	15	7.9
7	They can equip entrepreneurial youths with business skills	14	7.4
8	Universities conduct a lot of agricultural research	10	5.3
9	Disseminate more R&I information on the use of Lab chemicals	5	2.6
10	They can serve SMEs via Internet	2	1.0
	Total	**189**	**100.0**

From the results presented in table 27 above it can be seen that SMEs felt there are three leading reasons why university libraries can be formal sources of R&I information for their enterprises. In particular, 41(21.8%) said that libraries collect a lot of R&I information but just shelve it, 33 (17.6%) felt that this R&I information in libraries can be modified and used to provide practical solutions to SME problems and 32 (16.9%) respondents stated that this R&I information in libraries can be used to improve the quality of service delivery of SMEs. Very few of them, 2 (1%) believed that university libraries could take advantage of the internet and serve them with R&I information.

5.2.4 University Libraries' Dissemination of R&I Information

The study sought to know how R&I information was disseminated to the patrons. This question was paused to the 189 graduate students who felt that university library could be effective sources of R&I information for SMEs. These respondents were asked what the best platform was or service the university library would use to serve SMEs with R&I information. The results are shown in Figure 27.

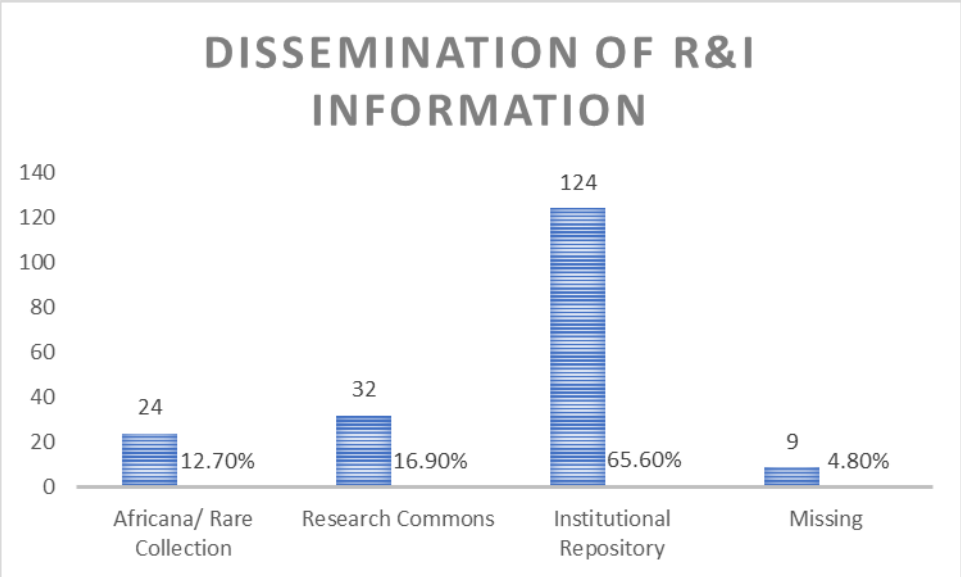


Figure 26: Most appropriate platform of disseminating R&I information (n=189)

As indicated in Figure 27 above, 124 (65.6%) of the respondents believed that the university library would effectively serve SMEs through using the university's institutional repository, these were followed by 32 (16.9%) who were of the view that SMEs can access the R&I information from the research commons, another category of 24 (12.7%) believed that the SMEs could physically access it from the Africana/rare collections of the university library.

There were also a meagre 9 (4.8%) who chose to be non-committal. Many interviewees also had very high hopes in institutional repositories; for example, one optimistically stated that:

> *"Unfortunately the university library currently does not have an institutional repository, nevertheless, plans are underway to set it up and once it is up, it would be one of the easiest way of marketing our R&I information but also a platform where any SME around the world can access and utilise our research output."(Male, Head of Library R&I unit).*

Furthermore, a statistical procedure was carried out to evaluate whether the variable of rating how the library was a gate way for research and innovation had any correlation with the variable of whether the research carried out by graduate students would meet the SMEs R&I information needs. Below in figure 28 is the graphical representation of this correlation which is generated from a cross tabulation of the two variables.

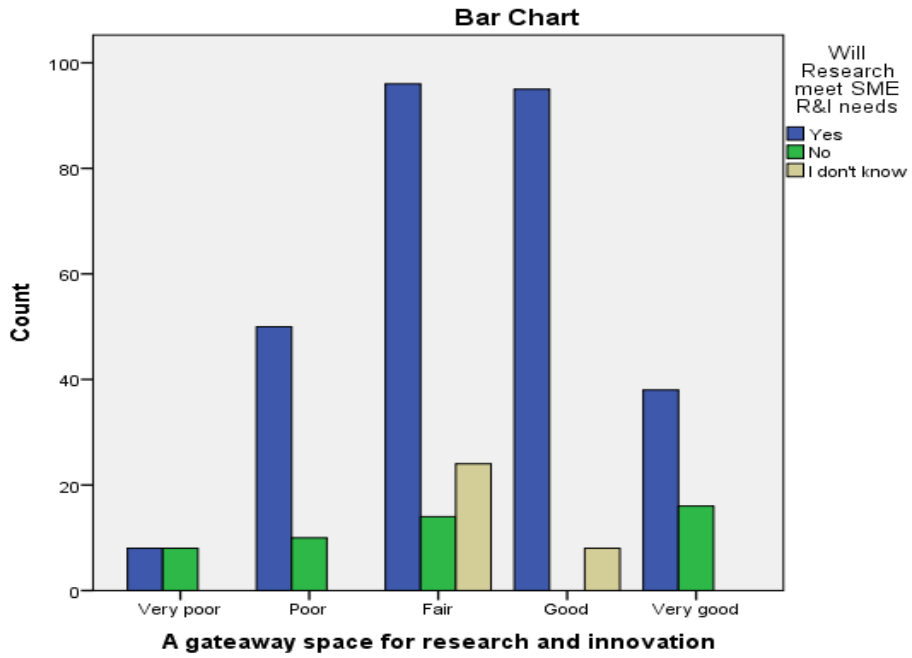


Figure 27: Correlation between the library as a gateway for research & innovation and whether the research carried out by graduate students would benefit SMEs (n=367)

As demonstrated in Figure 28 above, there is a correlation between the two variables. Most of the graduate students who used the library and felt that the university library provides spaces for research and innovation, rated them to be fair or good; they also stated that the research they were doing would meet the R&I information needs of SMEs. On the other hand, the few respondents who felt that the university library space for research and innovation was poor, were at the same time the ones who felt that their research was not suitable for SMEs.

The researcher went further to establish how strong this relationship was. The chi-square test was carried out. The results are presented in Table 28.

Table 28: Chi-Square Test for the significance of the correlation between the library as a gateway for research & innovation and whether the research carried out by graduate students would benefit SMEs

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	72.765[a]	8	.000
Likelihood Ratio	84.599	8	.000
Linear-by-Linear Association	1.308	1	.253
N of Valid Cases	367		

As indicated in the Table 28 above, the Pearson Chi-Square value is 72.765, the difference is 8 and the asymptotic significance is 0.000 after carrying out a Pearson Chi-Square test on the two variables. The p value being less than 0.001 indicates that there is a significant difference between these two variables. This statistically means that, since the asymptotic significance is less than 0.05, it can be concluded that there is a real and strong relationship between the two observed variables and it is not due to chance.

A similar test was also done on academic staff to ascertain whether they share the same views with the graduate students. The findings revealed that, there is a correlation between how the library was a gate away space for research and innovation, and whether the research carried out by academic staff would meet the SMEs R&I information needs. The results are presented in Figure 29.

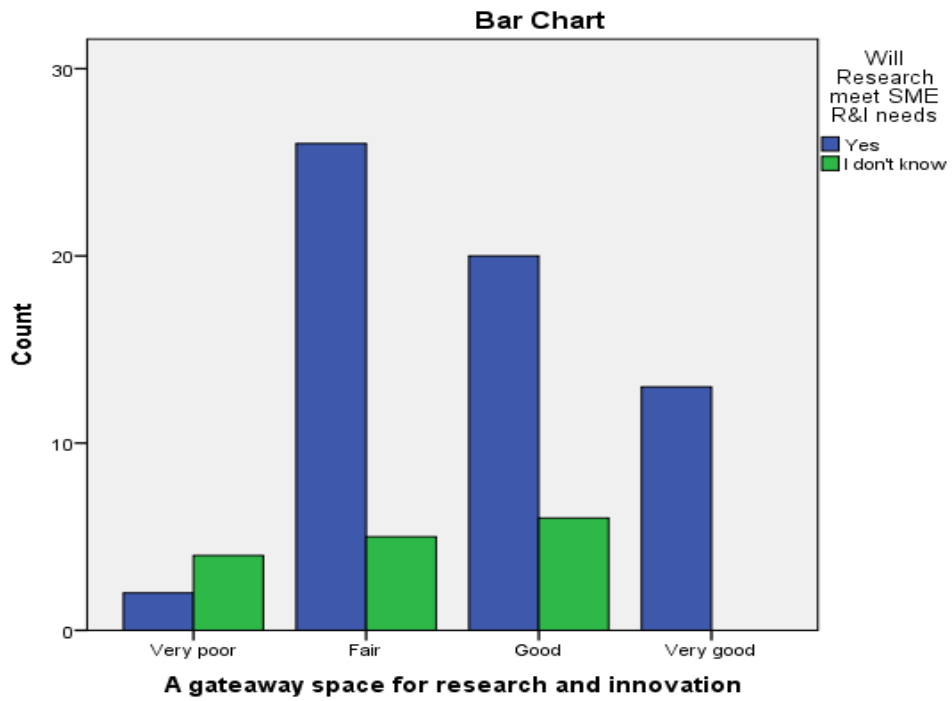


Figure 28: Correlation between the library as a gateway for research & innovation and whether the research carried out by academic staff would benefit SMEs (n=78)

As illustrated in figure 29 above, there is a correlation between the two variables. Most of the academic staff who used the library and felt that the university library spaces for research and innovation were fair or good, also stated that the research they were doing would meet the R&I information needs of SMEs. On the other hand, the few respondents who felt that the university library space for research and innovation was poor, were at the same time the ones who felt that their research was not suitable for SMEs.

The researcher further statistically tested the strength of this relationship. The chi-square test was carried out as shown in Table 29 below.

Table 29: Chi-Square Test for the significance of the correlation between the library as a gateway for research & innovation and whether the research carried out by academic staff would benefit SMEs

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	11.976[a]	3	.007
Likelihood Ratio	12.383	3	.006
Linear-by-Linear Association	7.535	1	.006
N of Valid Cases	76		

As indicated in the table above, the difference between the two variables is significant (X^2 = 11.976, df = 3, p < 0.001). Statistically, since the p value or the asymptotic significance (0.007) is less than 0.05, it can be concluded that even among the academic staff, there is a strong relationship between the two observed variables. This relationship is significant, real and not due to chance.

5.2.5 Agricultural Research in Uganda and Beyond

Wilson's 1999 model provides for information exchange. In this section, the researcher wished to establish any forms of information exchange between university libraries and other generators of R&I information. In other words, this study was interested to know other players outside the university library who could be serving SMEs with R&I information. This was done to avoid university libraries re-inventing the wheel or competing with these entities but instead complimenting or partnering with each other. The SMEs were consequently asked whether they were members of any professional bodies, associations or network where they could be accessing or sharing R&I information. The results are presented in Figure 30.

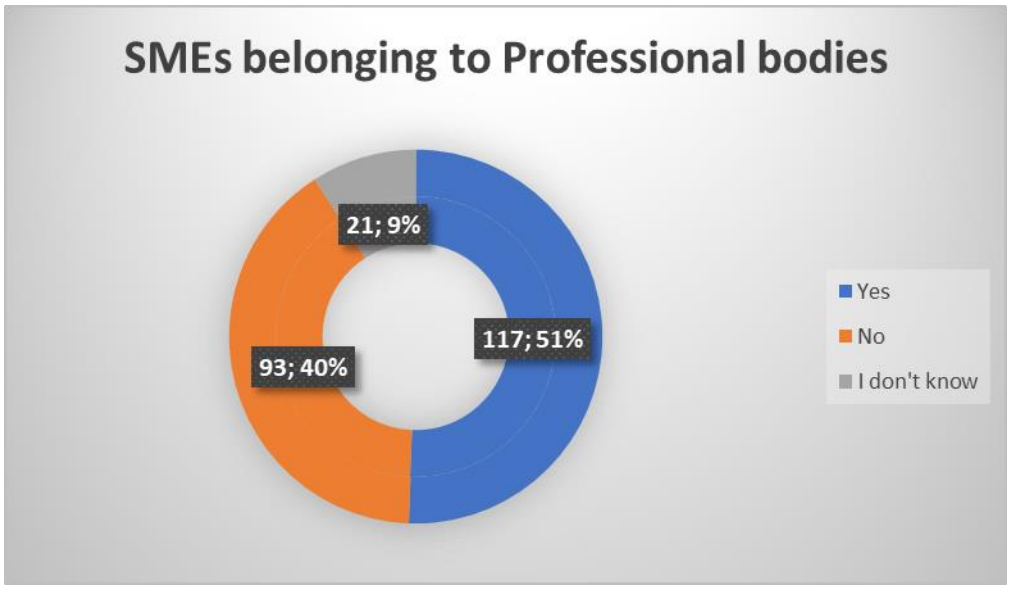


Figure 29: SMEs belonging to professional bodies (n=231)

As indicated in Figure 30 above, about half of the respondents' (117, 51%) SMEs belonged to professional bodies, while 93 (40.3%) did not belong to any professional group. A few of them (21, 9.1%) were not sure.

The SMEs which indicated that they belonged to professional groups were asked to give examples of those professional bodies which they belonged to. The results are presented in Table 30.

Table 30: Professional bodies SMEs belong to (n=117)

		Responses		Percent of Cases
		n	Percent	
Agricultural Research Networks	Uganda Farmers Association	57	19.0%	43.2%
	Private Sector Foundation	42	14.0%	31.8%
	Ministry of Trade, Industry and cooperatives	3	1.0%	2.3%
	Ministry of Finance, Planning and Economic Development	6	2.0%	4.5%
	Business information solutions	6	2.0%	4.5%
	Ministry of agriculture, animal industry n fish	99	33.0%	75.0%
	National Agricultural Research Organisation	54	18.0%	40.9%
	Network Uganda	3	1.0%	2.3%
	Uganda Chamber of Commerce n Industry	15	5.0%	11.4%
	Uganda Investment Authority	15	5.0%	11.4%
Total		300	100.0%	227.3%

a. Dichotomy group tabulated at value 1.

From the results in table 30 above, the leading professional bodies SMEs belonged to were: the National Agriculture Research Organisation (18%), Uganda Farmers' Association (19%), and Private Sector Foundation (14%). The professional body with least membership were Ministry of Trade, Industry & Cooperatives and Network Uganda with 3% SME membership each.

SMEs involved in this study went ahead to mention other bodies they belonged to, from which they accessed R&I information that include: Crop life Uganda, Export Trade Group, FACOM, KACITA, Mukono Central Millers Association, National Drug Authority, Pharmaceutical Society of Uganda, SINOCHEM, Uganda National Agricultural Dealers (UNADA), Uganda Agro-Chemicals Board, Uganda Motors Industry Association, Uganda Seed and Trade Association (USTA) and Uganda Veterinary Association (UTGA).

Accessing R&I information to boost ones business should be one of the benefits a business enterprise can enjoy from being a member to a professional body. The SMEs involved in this study were asked to indicate whether they really get R&I Information from these professional bodies. The results in Figure 31 present the views of respondents.

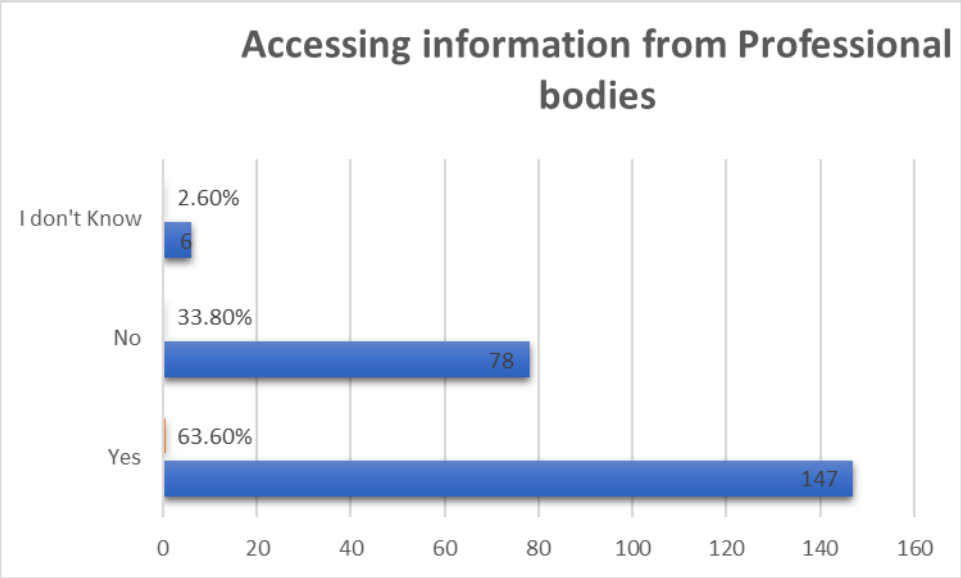


Figure 30: SMEs which get R&I information from Professional bodies (n=231)

As indicated in figure 31 above, 147 (63.6%) of the SMEs consented that they get R&I information, while 78 (33.8%) indicated that they did not get any R&I information as members of these professional bodies. Another category of 6 (2.6%) did not know.

The government of Uganda created the National Agricultural Advisory Services (NAADS) among other purposes to disseminate knowledge on improved farming methods. The researcher sought to know what these SMEs had to comment about the services of NAADs as far as the transfer of R&I agricultural information to promote their agricultural business is concerned. The results are provided in Table 31.

Table 31: Showing SMEs comments on NAADs (n=231)

S/No.	Positive Comments		Negative Comments	
1	Increased productivity	16	Very corrupt, involved in the army worm infestation scandal	44
2	Enjoying good partnership	10	Only helps those in government and foreigners	27
3	Introduced new farming methods	5	Only minds about supply of agricultural inputs and less of marketing after the harvest	20
4	Opened markets and increased demand of agricultural products	5	Supplies unreliable agricultural inputs	17
5	Experienced better outcomes from their advice	4	Not Helpful, fake and almost non-existent	15
6	Has promoted income generating activities	2	Disseminates irrelevant R&I information	15
7	Supply quality seeds	2	Has poor methods of disseminating R&I information	14
8	It tries to be interactive	1	Not in touch with modern agricultural trends	14
9	Helpful	1	Inefficient and too theoretical	13
10			Non-responsive and never gives feedback most especially on tenders	4
11			Only concentrated on subsistence farmers and never on SMEs	2
	Total	**46**		**185**

The views of SMEs on NAADS, as far as the transfer of agricultural R&I information is concerned, are summarised in the table 31 above. The majority 185(80.1%) expressed negative comments compared to the 46 (19.9%) respondents who had positive comments on the operations of NAADS.

The Figure 32 shows a coffee demonstration site in Mpigi district to describe this issue more.

Figure 31: A picture of a coffee demonstration site for NAADs in Mpigi district

5.3 Re-engineering University Libraries R&I Information Services

The study sought to explore the possibility of re-engineering the research and innovation information in university libraries in Uganda. This was in line with the study's second research question that focuses on how university library could re-engineer their library services to serve SMEs better. The Libqual^{+TM} theory and the modern theories of management were used to frame the responses got from this question. The emphasis in this section was put on the different research dimensions like re-engineering university library; services, technology, members of staff, partnerships and outreach. Below were the findings.

5.3.1 The need to Re-Engineer University Library Services for SMEs

Owing to the fact that academic staff and graduate students are the highest consumers of the R&I information collected and stored in the university libraries, respondents were asked for their opinion on whether the library in its current state, had an enabling environment where SMEs can easily come and access R&I information for their enterprises. This was in line with the LibQUAL+^{TM} model, under the service affect dimension which focuses on user expectations. The results are presented in Table 32.

Table 32: Enabling environment for SMEs in University Libraries (n=445)

S/No	Views	Academic Staff		Graduate Students	
		Frequency	**Percentage**	**Frequency**	**Percentage**
1	Yes	29	37.2	141	38.4
2	No	20	25.6	142	38.7
3	I do not know	28	35.9	84	22.9
4	Missing	1	1.3		
	Total	**78**	**100**	**367**	**100**

The results in table 32, indicate that slightly more than a third of academic staff and graduate students respectively (37.2% and 38.4%) believed that university libraries in their current state had an enabling environment for SMEs to come and easily access R&I information for their entrepreneurial programmes; n (38.7% and 25.6%) respondents felt the university libraries didn't have the enabling environment for SMEs to come and easily access R&I information; 35.9% and 22.9% did not know. Only one respondent, an academic staff, did not respond to this question. One interviewee had this comment on the library's enabling environment:

> *"There is no mechanism of creating awareness of the available R&I information to the surrounding community. The method we normally use is word of mouth through friends and this only works on the university campus and is not applicable to the surrounding business community." (Female Head of Library R&I unit).*

In order to also get a view from the expected consumers of R&I information from the library, the researcher also asked the SME respondents for their opinion. The results are shown in Figure 33.

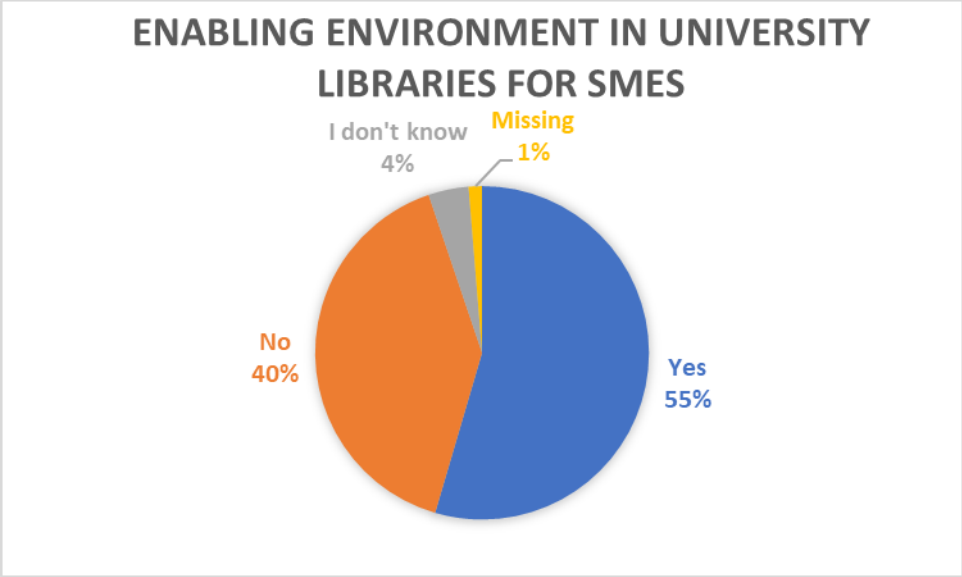


Figure 32: Enabling environment in University libraries for SMEs (n=231)

As illustrated in the Figure 33 above, slightly more than a half (126, 55%) of the SME respondents believed that university libraries in their current state had an enabling environment for SMEs to come and access R&I information for their entrepreneurial programmes. About two fifth (93, 40%) of them felt the university libraries did not have the enabling environment for SMEs to come and easily access R&I information. Nine of them (4%) did not know and 3 (1%) skipped this question.

Among the graduate students who stated yes (38.4%) in Table 32 above, the researcher went further to ask them to show different available mechanisms in the university libraries that can allow SMEs to access the R&I information. The results are presented in Table 33.

Table 33: Available University Library Mechanism of Serving SMEs (n=141)

		Responses		Percent of Cases
		n	Percent	
UL Mechanisms of serving SME[a]	Availability of a friendly Library Policy	81	16.0%	57.4%
	Presence of a Functional CAS & SDI	73	14.4%	51.8%
	Presence of R&I information sharing platforms	81	16.0%	57.4%
	Regular marketing of R&I information	45	8.9%	31.9%
	Availability of a required Infrastructure	52	10.3%	36.9%
	Dissemination of accurate and timely R&I information	69	13.6%	48.9%
	Well-staffed R&I library units	20	4.0%	14.2%
	Well-equipped R&I library units	85	16.8%	60.3%
Total		506	100.0%	358.9%

a. Dichotomy group tabulated at value 1.

From the results in table 33 above, it can be seen that university libraries in Uganda have the capacity of serving SMEs with R&I information. The highest number of the respondents (16%) were of the view that the R&I library units are fairly equipped, many of the university libraries have tried to have a friendly library policy in place and that the university libraries have created R&I information sharing platforms. However, not many were satisfied with the staffing of these units and the way the R&I information is marketed.

The respondents who indicated that the university libraries did not have an enabling environment for SMEs to access R&I information were asked to mention specific reasons why they think so; their reasons are presented in Table 34.

Table 34: Reasons why University Libraries didn't have an enabling environment for SMEs to access R&I information (n=142)

S/No	View	Frequency	Percent
1	There is no documentation of innovations and inventions that suit SMEs	71	39.2
2	Library environment not conducive for SMEs (R&I units are not well stocked, there are inadequate resources for agricultural SMEs in the library)	51	28.0
3	University library services are in English, yet most SMEs prefer local languages	38	20.9
4	Limited access to the web	11	5.9
5	The library is simply not interested in such	7	3.8
6	Library stocks old literature and texts. There is a lot of inaccessibility to important articles	4	2.2
	Total	**182**	**100.0**

As indicated in table 34 above, the reasons why the university libraries in their current state were not ready to serve SMEs with R&I information as revealed by 71 (39.2%) of the respondents was that university libraries lack R&I information formats suitable for SMEs, 51 (28%) felt university libraries' environments were not conducive for SMEs and 38 (20.9%) felt that the R&I was in English, a language not easily understandable by most SMEs. The least number of respondents (4, 2.2%) thought that the libraries stock old and inaccessible R&I information.

The researcher further asked the academic staff and graduate students whether there was need to re-engineer the university library in order to serve SMEs better. This was in line with the new theories of management, under the social techno approach which focuses on the user tools. The results are provided in Table 35.

Table 35: The need to re-engineer library R&I services for SMEs (n=445)

S/No	Views	Academic Staff		Graduate Students	
		Frequency	Percentage	Frequency	Percentage
1	Yes	69	88.5	318	86.6
2	No			25	6.8
3	I do not know	7	9	24	6.6
4	Missing	2	2.6		
	Total	**78**	**100**	**367**	**100**

From the results in table 35 above, it is clear that over 80% of both categories of respondents believe that there is need to re-engineer library services if the university library is to serve SMEs with R&I information better. None of the academic staff felt that there was no need, but 25 (6.8%) graduate students were of the view that there was no need of re-engineering the library services for SMEs. Those who didn't know, were less than 10% in both categories and only 2 (2.6%) academic staff missed or skipped answering this question.

The researcher probed this phenomenon deeper and asked the respondents to name some services and areas in the library that needed to be re-engineered, if these libraries are to serve the SMEs better. Below were the opinions of the respondents in Table 36.

Table 36: Areas in the library that need to be re-engineered (n=445)

S/No	Re-engineering views	Academic Staff		Graduate Students	
		Frequency	Percentage	Frequency	Percentage
1	Repackaging R&I information	36	17.1	192	20.2
2	Digitising R&I information	44	21.0	194	20.5
3	Community Engagement	43	20.5	180	19.0
4	Current Awareness Services and Instant messaging	12	5.7	92	9.7
5	Use of Social Media	37	17.6	134	14.1
6	Use of the Library website	38	18.1	156	16.5
	Total	**210**	**100.0**	**948**	**100.0**

As indicated in the table 36 above, the leading three areas the university libraries need to re-engineer, if they are to serve SMEs better are: digitisation of the R&I library information (21% and 20.5%), community engagement (20.5% and 19%) and repackaging of R&I information (20.2% and 17.1%) respectively. The least area according to the respondents was the need to re-engineer the instant messaging and current awareness services. Similarly, both academic staff and graduate students were asked their views on the library services that need to be re-engineered and below in Table 37 are their opinions.

Table 37: Areas in the library that need to be re-engineered according to the SMEs (n=231)

		Responses		Percent of Cases
		n	Percent	
Re-engineer Lib Services[a]	Digitising of the R&I information	114	20.1%	54.3%
	Promoting research in business development	60	10.6%	28.6%
	Repackaging R&I information	81	14.3%	38.6%
	Use of social media	117	20.6%	55.7%
	Use of CAS and SDI	63	11.1%	30.0%
	Community engagement	57	10.1%	27.1%
	Creation of friendly environment in University Libraries	75	13.2%	35.7%
Total		567	100.0%	270.0%

a. Dichotomy group tabulated at value 1.

The results in Table 37 above reveals almost the same views as that of Table 36. Most respondents from SMEs (117, 20.6%) felt that university libraries need to re-engineer the way they use social media, 114 (20.1%) were of the view that the digitising needs re-engineering and 81 (14.3%) are of the view that repackaging R&I library information needs to be re-engineered. Ironically, the least number of respondents (60, 10.6%) raised the view of re-engineering research in business development.

5.3.2 Re-engineering University Library Technologies for SMEs

In the previous section, the respondents indicated that repackaging of R&I by libraries as one of the leading areas that need to be re-engineered. The researcher specifically sought to know how many of the academic staff and graduate students considered it important; below were the results.

Table 38: The need for repackaging R&I information for SMEs (n=445)

S/No	Views	Academic Staff		Graduate Students	
		Frequency	**Percentage**	**Frequency**	**Percentage**
1	Yes	36	46.2	192	52.3
2	No				
3	I do not know				
4	Missing	42	53.8	175	47.7
	Total	**78**	**100**	**367**	**100**

As indicated in Table 38 above, almost half of all respondents (academic staff and graduate students) (46.2% & 52.3%) respectively stated that university libraries need to repackage the R&I information. Surprisingly there were none who stated no, or those who didn't know, instead they missed or skipped this question. The academic staff and graduate students were further asked to state the different ways this information should be repackaged if it is to be accessed by SMEs better. The results are presented in Table 39.

Table 39: The different ways of repackaging R&I information for SMEs (n=445)

S/No	Re-engineering views	Academic Staff		Graduate Students	
		Frequency	Percentage	Frequency	Percentage
1	Repackaged into Short Documentaries	40	19.0	206	21.9
2	Repackaged into News briefs in the media	43	20.4	150	16.0
3	Summarised in University Newsletters	35	16.6	196	20.9
4	Summarised on Social Media platforms	39	18.5	184	19.6
5	Making Abstracts and Indexes	34	16.1	96	10.2
6	Conversion into Braille	8	3.8	46	4.9
7	Conversion into Music	12	5.7	62	6.6
	Total	**211**	**100.0**	**940**	**100.0**

As presented in Table 39, the three leading ways in which respondents wished the R&I information could be repackaged as expressed by 206 (21.9%) graduate students and 40 (19%) academic staff was to convert into short documentaries, 196 (20.9%) graduate students and 35 (16.6%) academic staff suggested that it should be converted into newsletters and 184 (19.6%) graduate students and 39 (18.5%) academic staff suggested that university libraries should repackage it using social media. The idea that was least mentioned was the one where 46 (4.9%) graduate students and 8 (3.8%) academic staff suggested that R&I information should be converted into braille which is mainly used by persons with visual impairment. From the interviews, one respondent noted:

> "*The university has to employ technology if it is to effectively repackage the R&I information for SMEs. Good enough many people in the community now have smart phones, so the library can use technology to convert this R&I information into formats that can easily be accessed using the phones." (Female University IT staff).*

Similarly, SMEs were asked the form in which the format in which R&I could be presented to them. The results are shown in Table 40.

Table 40: Forms of repackaging R&I information according to SMEs (n=231)

		Responses		Percent of Cases
		n	Percent	
Repackage R&I Information[a]	Graphical use of pictures and drawings	60	7.0%	29.9%
	Use of symbols and signs	18	2.1%	9.0%
	Change it from print to audio format	48	5.6%	23.9%
	Translate language from English to local languages	135	15.7%	67.2%
	Change format from print to video	66	7.7%	32.8%
	Organise sessions of exposing R&I information	72	8.4%	35.8%
	Repackage it into poster formats	48	5.6%	23.9%
	Store it in CD format	54	6.3%	26.9%
	Ease its access online	90	10.5%	44.8%
	Repackage to be presented on radio programme	87	10.1%	43.3%
	Repackage to be telecast on TV	93	10.8%	46.3%
	Transcribe it into braille	12	1.4%	6.0%
	Collaborate with extension workers to disseminate it	6	0.7%	3.0%
	Upload it on university social media sites	69	8.0%	34.3%
Total		858	100.0%	426.9%

a. Dichotomy group tabulated at value 1.

The results presented in Table 40 show that the SMEs had far more ideas compared to those proposed by the academic staff and graduate students in Table 38. Moreover, the SMEs' most popular options were far different from those of the academic staff and graduate students. The highest number of the respondents of SMEs 135 (15.7%) wished that library R&I information be translated from English to local languages, 93 (10.8%) of them were of the view that R&I information should be repackaged and telecasted on television, 90 (10.5%) suggested that the library digitises it and eases online access, 87 (10.1%) suggested that the library should partner with radio such that the R&I information is repackaged and

broadcasted on radios. The least popular ideas were to use braille 12 (1.4%) and working with agricultural extension workers 6 (0.7%). Interestingly, the idea of converting R&I information into braille was also the least raised idea by the academic staff and graduate students. There were also other formats suggested by SMEs respondents which were less than 0.5% but worth mentioning and these included; repackaging R&I information into agro-based magazines, animated in cartoons and comics for children to encourage them to join agro business, develop computer applications, use of community radios and megaphones. Talking about developing computer applications, one respondent was very passionate about this issue and had this to comment:

> *"IT has become a supreme driver of almost all library services. Today a University library would be virtually stagnant without IT. For us here, we are trying to integrate IT in all our routine library work to an extent that we are using IT tools more than any other university library in Uganda. I am currently thinking and reading about a tool we can use as an information retrieval system that translates the abstracts of our thesis and journal articles into local and indigenous languages. I know it is something complex but it is doable." (Male University Library Systems Librarian).*

Like the respondent above, many others raised this issue of translation from English to indigenous languages if R&I information is to be beneficial to SMEs. Another respondent stated that, "*Many library patrons find it easy to search and download library resources, but few can interpret what exactly the content of those resources is all about" (Female, Head of Library R&I unit).*

5.3.3 Re-engineering University Library Staff for SMEs

Since the respondents were of the view that R&I information in the libraries needs to be repackaged for the SMEs, the researcher asked the academic staff whether the university library staff working in these R&I units require special or unique skills for them to serve the SMEs better. This was in line with the new theories of management, under the systems approach which focuses on some components like the staff, pattern of behaviours and goals of an organisation. The results are presented in Figure 34.

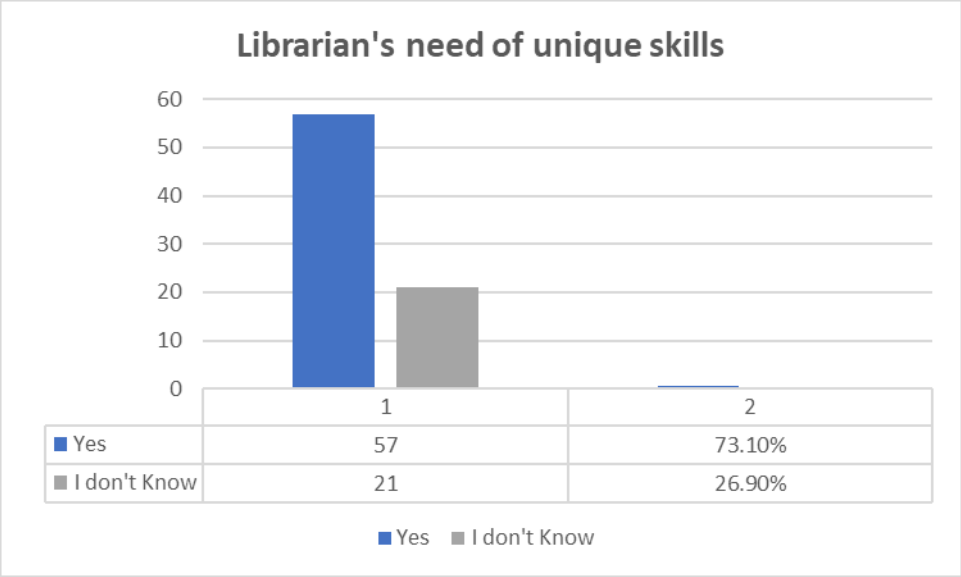


Figure 33: R&I Librarian's need of unique skills (n=78)

The results shown in Figure 34 above reveal that 57 (73.1%) of the respondents stated that librarians need unique skills if they are to serve SMEs with R&I information better. None of them stated that they did not need these skills. A category of 21 (26.9%) stated that they did not know. One male university IT officer was interviewed and commented that "*Many of those librarians are trained theoretically and they are not in touch with the modern and trending library technologies*". This was however rubbished by another librarian who stated that;

> "*Academic librarians in both public and private Ugandan universities have got a number of opportunities to be trained in emerging and trending library practices. For example, the Consortium of Uganda University Libraries (CUUL) has organised a number of trainings for librarians in Koha, digitisation, and open access among others. The University of Pretoria through the Carnegie Corporation has also sponsored many Ugandan university library staff to attend the Continuous Professional Development (CPD) certificate course where many of these skills in emerging library trends are taught." (Male head of R&I library unit).*

The respondents were probed deeper to suggest the unique skills library staff working in these R&I units need in order to serve the SMEs better. The results are shown in Table 41.

Table 41: Unique skills needed by R&I librarians (n=78)

n=78		Responses		Percent of Cases
		n	Percent	
Librarian unique skills[a]	Proven Leadership skills	12	15.4%	28.1%
	Communication Skills	46	59.0%	93.0%
	Skills in Repackaging Information	20	25.6%	45.6%
Total		78	100.0%	166.7%

a. Dichotomy group tabulated at value 1.

The results in table 41 reveal that the leading unique skill was communication with 46 (59%), followed by 20 (25.6%) respondents stating repackaging skills and lastly 12 (15.4%) respondents stated proven leadership skills. There were also other unique skills mentioned by the officials who were interviewed, and these include digital skills, knowledge in copyright, research assistance and willingness to assist members of the community.

5.3.4 Re-engineering University Library Partnerships

The study sought to find out whether Ugandan University libraries had any form of shared mutual visions, missions, standards and policies that provide for creating library partnerships which relate to serving SMEs with research and innovation information. It was found that all the eighteen university officials interviewed indicated that their universities had university library policies and strategic plans that promote community engagement and outreach programmes. The only challenge was that they were all general and none was specific or had a special provision relating to serving SMEs with information that supports their entrepreneurial programmes.

One respondent stated that, "*The university and library are currently focusing on academics though the idea of serving SMEs is welcome"*. Another respondent stated:

> "*The university has a strategic goal of community outreach where all university departments are encouraged to participate depending on the design of their programmes. The Library department is doing so to private primary and secondary schools which are considered SMEs. There has not been any direct intervention in line with agricultural SMEs yet…" (A male University librarian)*

In another interview, with a female university librarian, she also stated that;

> *"The library not only has a policy on community outreach, but it periodically carries out outreach programmes to schools in remote areas like Buvuma islands in Lake Victoria." (A female University Librarian)*

It was clear that in many universities, their library policies do not restrain innovation. Any library staff who comes up with an innovative idea are supported even if it is not catered for in the library policy. Sometimes if such innovations are in line with the strategic plan of the university, then they can be supported at that level. A number of Ugandan universities strategic plans provide for both local and international partnership and collaboration.

5.3.4.1 University Library Collaborations with Professional Library Bodies

This study was particularly interested in establishing the nature of partnerships university libraries have with different professional and non-professional library bodies. Based on all the six university librarians interviewed, it was revealed that the Consortium of Ugandan University Libraries (CUUL) was the leading body that brings together Ugandan university libraries. Most of this partnership is geared towards the sharing of electronic resources. One respondent stated that:

> *"CUUL injects 80% of her resources towards purchasing and easing the access of e-resources. They have not ventured much into other aspects like University Libraries serving SMEs with R&I information. If this is to be done, CUUL has to first build the capacity of the university librarians and later inject resources in such a project." (A male University Librarian).*

Another Female University Librarian noted that CUUL could indeed take up this issue and spearhead it among her members because anything, however small, as long as different partners agree to work together, can grow.

The researcher also probed whether there were other professional library bodies collaborating with Ugandan university libraries. The respondents mentioned the Uganda Library and Information Association (ULIA), Electronic Information for Libraries (eIFL), International Federation of Library Association – Building Strong Libraries (IFLA-BLA), Book Aid International (BAI), the International Association of Technological University Libraries (IATUL), Standing Conference of African National and University Librarians (SCANUL) among others. However, most of these partnerships are largely based on organising conferences and sharing best library practices. There is almost nothing concerning the service of SMEs in all these national and regional partnerships with these professional library bodies.

5.3.4.2 University library collaborations with Non-professional library bodies

The researcher inquired of the different entities university libraries can partner with in order to serve SMEs better. Below in Table 42 are seven broad categories they suggested that university libraries should partner with to ease their dissemination of R&I information to SMEs.

Table 42: Showing suggested partners SMEs wish University libraries to work with as they disseminate R&I information(n=189)

S/No.	Suggested Partner (n=189)	Frequency	Percent	Cumulative Percent
1	Community leaders	83	43.9	43.9
2	Computer/ IT Experts	53	28.1	72.0
3	Media	21	11.1	83.1
4	Government	12	6.3	89.4
5	Funding Agencies	11	5.8	95.2
6	Public and Community libraries	6	3.2	98.4
7	Research Centres	3	1.6	100.0
	Total	**189**	**100**	

The results in table 41 above, reveal leading partners that university libraries could work with to serve SMEs including community leaders (43.9%), Computer experts (28.1%) and the Media (11.1%). Surprisingly the least partners the university libraries could work with were public libraries (3.2%) and research centres (1.6%). This could perhaps be attributed to the fact that information in public libraries is considered by SMEs to be too scholarly and complicated.

Under community leaders, the respondents wished that the university library should open up the library spaces to the community, make it more accessible by relaxing the opening and closing hours, embrace the open access movement, create more formal and informal interactions with the community through organising for them workshops, seminars, outreach programmes where they sensitise the SMEs about the available R&I information that can be used to boost their businesses. Moreover, the respondents mentioned creating similar partners with the civil society, Farmer's associations, community-based organisations and non-governmental organisations. This civil society has a leverage over the library because they operate at the grass root; it is very easy to help the library penetrate the communities and pass on any developmental information, since the civil society are always working with these communities on a daily basis.

The strategy of university libraries partnering with computer experts would involve the university library working with these experts to design computer applications that the SMEs could work with and access the R&I information in the libraries. This strategy would further include issues of digitisation of R&I information in order to allow remote access by the SMEs, designing of SME user-friendly university library websites, conversion of R&I information into audio formats, videos, documentaries, brochures, use of social media platforms among others.

Partnering with government according to these SMEs would include lobbying with government to come up with policies that ease the generation, processing, storage, retrieval and dissemination of this R&I information. These policies and guidelines should create an enabling environment for SMEs to know what business research is going on in universities, how this research can positively impact on their businesses and also to easily access and apply this research and innovation information in their businesses.

The option of partnering with the media was also mooted. The respondents had already noted the problem of a poor reading culture as one of the leading factors curtailing SMEs from accessing and using R&I information in university libraries. They therefore suggested that if university libraries would partner with the media i.e. working with radio and television stations, as well as newspaper and magazine publishers to share their R&I information through those channels, it would go a long way in increasing the awareness and usage of this information by SMEs.

Several respondents were of the view that partnership starts with funds. Without the necessary logistics, it will all be a waste of time. For them, they were suggesting that university libraries should initiate partnerships with funding agencies such as development partners to whom they can write or apply for grants that can support the business ideas and innovations found in the R&I information. The whole process of supporting upcoming entrepreneurs, growing markets, regulating patents and all other business inventions needs enough funds, so university libraries need strong partnerships with both local and international funding agencies to support such partnerships.

University libraries collaborating with public and community libraries was another unique idea raised. Essentially these are the very libraries that are supposed to serve this category of people who are in the general public dealing in both formal and informal businesses. The

only challenge is that though these libraries might have the structures and the staffing, not many have the up-to-date and relevant resources in their collections. So, it is at this point that the university libraries can come up with a mechanism of sharing some of its current and relevant R&I information with them and encourage SMEs who might not be able to make it to the university library spaces to also find the same content in the public and community libraries.

Finally, the idea of university libraries partnering with the available research centres was raised. Though a lot of R&I information is generated in universities, research centres also generate R&I information which also might not successfully find its way to the final consumer like the SMEs proprietors. The university library can help in this regard by partnering with these research centres. They make arrangements of tapping such vital information and helping in disseminating it to the SMEs proprietors who might be interested in using this research information for their business and entrepreneurial programmes. The respondents further highlighted that the partnership should not only stop with research centres but should extend to private laboratories, low cost workshops, workrooms and testing centres.

5.3.5 Re-engineering University Library Outreach Services

In section 5.3.1 the respondents raised the issue of community engagement as one of the key ways the library could re-engineer, if it is to serve better SMEs with R&I information. The researcher therefore inquired from them the different ways the library could re-engineer as far as community outreach or engagement is concerned. The results are provided in Table 43.

Table 43: How universities should re-engineer their library outreach services (n=676)

		Responses		Percent of Cases
		n	Percent	
Community outreach[a]	Open Access	201	18.8%	56.9%
	Training library staff to disseminate R&I information to SMEs	237	22.1%	67.1%
	Training SME in Information Literacy	145	13.5%	41.1%
	Holding entrepreneurship workshops for SMEs	199	18.6%	56.4%
	Holding SMEs Library days	153	14.3%	43.3%
	Offering start up business consultancy for SMEs	137	12.8%	38.8%
Total		1072	100.0%	303.7%

a. Dichotomy group tabulated at value 1.

As demonstrated in Table 43 above, the three leading ways Ugandan university libraries could re-engineer their community outreach as revealed by 237 (22.1%) respondents was the issue of conducting special training for library staff to serve SMEs; 201 (18.8%) stated this can be done through university libraries embracing open access; and 199 (18.6%) noted university libraries conducting R&I entrepreneurship workshop for SMEs. One respondent noted:

> *"Conducting community engagement programmes for the SMEs is certainly one of the sure ways for a university library to directly reach the SMEs at the grassroots. However, most Ugandan university libraries are grossly under-staffed. Most service points are manned by only one library staff member, if you remove that staff and take him or her for community outreach that means closing down that service." (Female, Head library IT).*

In contrast one systems librarian in another university stated that;

> *"Our library is going to pilot or launch a community outreach programme on 23rd October 2018 during our university library week. This program will target primary and secondary schools. As for the staff, we intend to use our Library and information science student and graduate interns. We shall be paying them a modest allowance and see how it goes." (Male Systems Librarian)*

In this same university, the business school already started engaging the community where they organise workshops and train them in entrepreneurship skills, book keeping and later encourage them to visit the schools website where many such resources can be downloaded freely. They believe in a philosophy that despite the fact that it is good for a mother to first feed her children before thinking of outsiders, it is also very silly to feed one's children very well; they grow fat and leave healthy lives, while the outsiders are dying of starvation.

5.4 Access and Utilisation of R&I Information by SMEs

The research findings of sections 5.2 and 5.3 of this chapter predominantly focus on university libraries. This and the next section focus on SMEs. Under this section, the study sought to investigate whether SMEs had the necessary skills and competencies to access and use R&I information in Ugandan University Libraries. This was in line with the third research question of the study which puts its emphasis on access and utilisation of R&I information by SMEs. The Wilson's 1999 model of information seeking behaviour and modern theories of management were used to frame the responses got from this question. This section therefore presents research findings of the R&I information needs of SMEs, the SME sources of this information, the skills needed by SMEs to access R&I information, information literacy programs for SMEs and the utilisation of R&I information by SMEs.

5.4.1 R&I Information Needs of SMEs

The respondents drawn from SMEs were asked to declare whether they had R&I information needs as they run their enterprises. This was in line with the Wilson's 1999 model, under the dimension of the information needs of an information seeker. The results are shown in Figure 35.

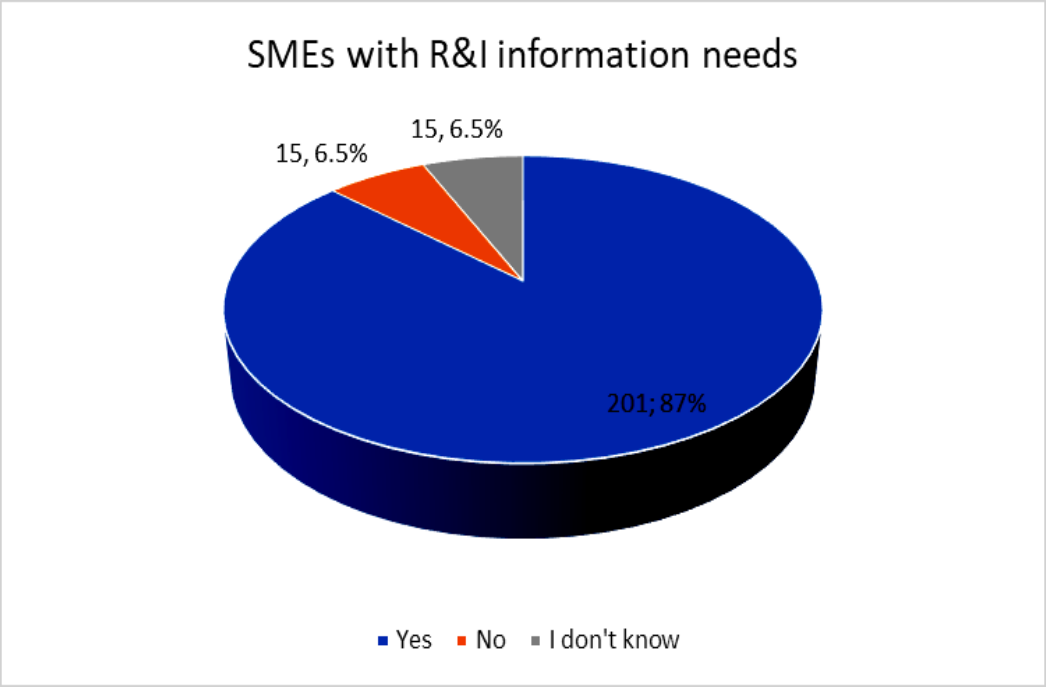


Figure 34: SMEs with R&I information needs (n=231)

From the results in Figure 35 above, it is very clear that 201 (87%) of the respondents from SMEs admitted that they had R&I information needs. Fifteen (15 or 6.5%) respondents stated that they did not have R&I information needs. There was also a category of 15 (6.5%) of the respondents who did not have any idea whether they had R&I information needs or not.

The researcher further asked respondents to state the different kinds of R&I information they need while conducting their business. The results are presented in Table 44.

Table 44: The different types of R&I information needed by SMEs(n=231)

SMEs Business information needs		Responses N	Responses Percent	Percent of Cases
	Start up new business	36	3.0%	17.9%
	Enhancing business growth	123	10.4%	61.2%
	Licensing	24	2.0%	11.9%
	Increasing Productivity	117	9.8%	58.2%
	Increasing sales and marketing	138	11.6%	68.7%
	Export trade	51	4.3%	25.4%
	Identification of training opportunities	75	6.3%	37.3%
	Application of credit	24	2.0%	11.9%
	Identification of investment opportunities	51	4.3%	25.4%
	Application of patents and trademarks	27	2.3%	13.4%
	Information on Finance, capital and loans	39	3.3%	19.4%
	Information on local markets	69	5.8%	34.3%
	Information on Forex and international markets	39	3.3%	19.4%
	Information on appropriate technologies	48	4.0%	23.9%
	Information on business laws and taxation	42	3.5%	20.9%
	Information on business management skills	66	5.6%	32.8%
	Information on business competitors	69	5.8%	34.3%
	Information on government policies and regulations	63	5.3%	31.3%
	Information on security	24	2.0%	11.9%
	Information on trade fair, tender and contracts	57	4.8%	28.4%
	Business decision support	6	0.5%	3.0%
Total		1188	100.0%	591.0%

a. Dichotomy group tabulated at value 1. (Source: Survey data 2017).

The results in Table 44 above show the three leading types of R&I information needed by SMEs as revealed by 138 (11.6%) of the respondents include the need for R&I information on increasing their sales and marketing, need information on enhancing business growth (123, 10.4%) and the need for information on increasing productivity in their business (117, 9.8%). The least needed R&I information by the agricultural SMEs was on business decision support with only 6 (0.5%) respondents. Other R&I needs mentioned which were less than 0.5% but worth mentioning were; ability to tell counterfeit products and reaching out to customers in remote areas.

The researcher probed further to establish the sources these SMEs go to for R&I information they use in their businesses. The results are in Table 45.

Table 45: Sources of SMEs' R&I information (n=676)

		Responses		Percent of Cases
		n	Percent	
SME information Sources[a]	Library source	9	1.0%	4.0%
	Radio	87	10.0%	38.7%
	Websites	114	13.1%	50.7%
	Brochures	39	4.5%	17.3%
	Newspapers	123	14.1%	54.7%
	Television	66	7.6%	29.3%
	Research and Development Units	9	1.0%	4.0%
	Mobile Phones	102	11.7%	45.3%
	Fliers	24	2.7%	10.7%
	Non-Governmental Organisations	24	2.7%	10.7%
	Innovation experts	18	2.1%	8.0%
	LG Extension Staff	21	2.4%	9.3%
	NARO Extension Staff	45	5.2%	20.0%
	Professional Networks and Collaborations	66	7.6%	29.3%
	Social Media	63	7.2%	28.0%
	Friends	63	7.2%	28.0%
Total		873	100.0%	388.0%

a. Dichotomy group tabulated at value 1. (Source: Survey data 2017).

From the table 45 above, it can be deduced that the highest number of respondents (123, 14.1%) access their R&I information from newspapers, followed by 114 (13.4%) who visit websites to access R&I information for their businesses and the third source was mobile phones (102, 11.7%). The libraries and research and development units were the least sources used with each standing at 9 (1%). There were however other sources that scored below 1% and these were carrying out research with fellow farmers, from customers, farming demonstrations, international tours, manufacturers, suppliers and trade fairs.

5.4.2 Skills and Competencies Needed by SMEs to Access and Use R&I Information

The researcher sought to find out whether the SMEs had the required skills and competences for accessing R&I information in university libraries by asking them if they had used any university library in the recent past. The responses are provided in Figure 36.

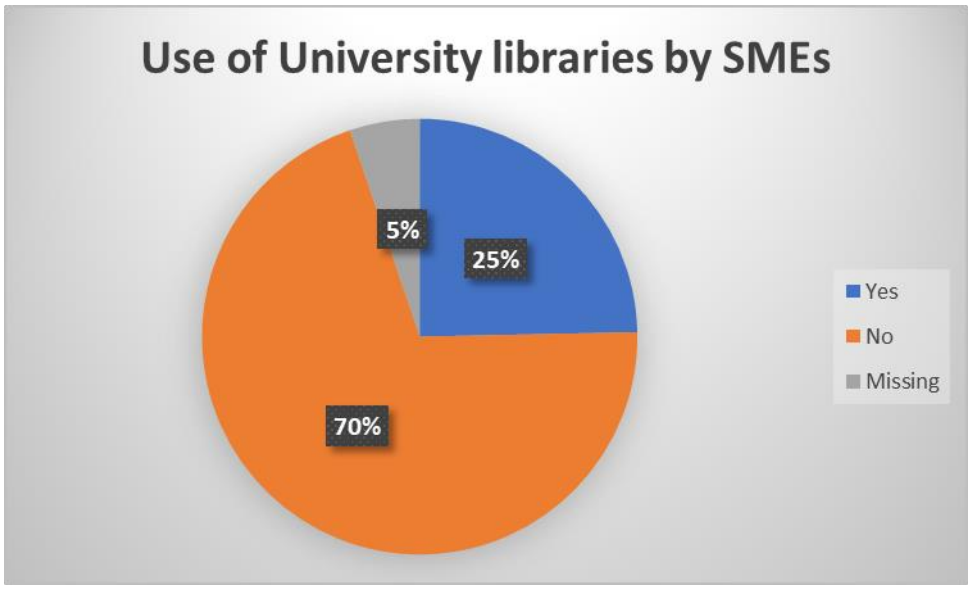


Figure 35: The use of university libraries by SMEs (n=231)

From the results displayed in the Figure 36 above, 162 (70.1%) of the SME respondents had never used a university library in the recent past. Only close to a quarter (57, 24.7%) consented that they had used a university library in the recent past. Another 12 (5.2%) skipped this question. One interviewee noted that;

> *"In our university library we receive quite a couple of external users and researchers and they normally come from Non-governmental organisations, central and local governments but rarely do we get patrons from the business sector." (Female University Librarian).*

The respondents from SMEs who had indicated that they had used a university library in the recent past were asked to state the kind of information they were searching for, from the library as business people. The results are provided in Table 46.

Table 46: The type of R&I information SMEs using university libraries search for (n=57)

S/No	Type of information	Frequency	Percent	Percent
1	Effective Business management/ Customer satisfaction	15	26.8	26.8
2	Improving diary production in cattle through improved feeds	13	23.2	50.0
3	Preventing disease attacking chicks / animal diseases	10	17.8	67.8
4	Boosting animal production	4	7.1	74.9
5	Rabbit meat	4	7.1	82.0
6	Effects of agro chemicals	3	5.4	87.4
7	General agricultural information	2	3.6	91.0
8	Drought resistant seeds/ plants	2	3.6	94.6
9	Starting business	1	1.8	96.4
10	Pumpkins	1	1.8	98.2
11	Marketing strategies	1	1.8	100.0
	Total	**56**	**100.0**	

The results in Table 46 above, show that the top type of R&I information these SMEs are using university libraries for are: information on effective business management and meeting customer satisfaction (15, 26.8%); information on improving diary production (13, 23.2%); information on preventing animal diseases (10, 17.8%). The respondents were further asked to state for how long they had been using the university libraries for information. The results are provided in Table 47.

Table 47: Duration SMEs have used university libraries (n=57)

S/No	Type of information	Frequency	Percent	Percent
	1 year	28	50.0	50.0
	2 years	13	23.2	73.2
	3 years	10	17.8	91.0
	4 years	3	5.4	96.4
	5 years	1	1.8	98.2
	1 week	1	1.8	100.0
	Total	**56**	**100.0**	

The results in Table 47 show that almost half of the SME as revealed by 28 (50%) of respondents indicated that they have been using the library for a year, 13.2 (23.2%) had been using university libraries for two years. On the other hand, 1 (1.8%) respondent each had used it for one week and another had used it for five years respectively.

The study also sought to know how the R&I information the SMEs accessed from the university library impacted on their businesses. The results are presented in Table 48.

Table 48: The Impact of University Library R&I Information on SMEs' Businesses (n=57)

S/No	Impact	Frequency	Percent	Cumulative percent
1	Expanded my business/ increased productivity	20	48.8	48.8
2	Increased sales and profits of the business	9	22	70.8
	Made me more knowledgeable	5	12.2	83.0
3	Improved my skills in business management	4	9.7	92.7
4	Received more advise on farming	2	4.9	97.6
5	Got enlighten on the side effects of agro chemicals	1	2.4	100.0
	Total	**41**	**100.0**	

The results in Table 48 reveal that the few SMEs who accessed and utilised R&I information from university libraries experienced a positive impact on their agricultural businesses. Most of these respondents (20, 48.8%) used the R&I information to expand their businesses and also boost productivity, followed by 9 (22%) who used this information to increase their sales and profits, while 5 (12.2%) just wished to be more knowledgeable. The least group in this study (1, 2.4%) gained more knowledge on the side effects of agro chemicals.

For the respondents who had indicated that they had never visited or used a university library in the recent past, they were asked to state reasons why they did not use the library. The results are provided in Table 49.

Table 49: Why SMEs are not patronising university libraries (n=162)

		Responses		Percent of Cases
		n	Percent	
Why SME were not using University Libraries[a]	Not aware of UL R&I service	84	57.1%	65.1%
	Library is far	27	18.4%	20.9%
	R&I information in library is complicated	30	20.4%	23.3%
	R&I information is irrelevant	6	4.1%	4.7%
Total		147	100.0%	114.0%

a. Dichotomy group tabulated at value 1. (Source: Survey data 2017).

The results in Table 49 above, clearly show that half (84, 57.1%) of the respondents were not aware that R&I information services exist in university libraries, 30 (20.4%) of them attempted but found that the information was complicated to understand, 27 (18.4%) of them wished to come, but the university libraries were very far away from them, lastly 6 (4.1%) found the R&I information in university libraries irrelevant to their kind of business.

These respondents were further probed and asked whether they would be interested in the university library conducting for them information literacy programs so that they get oriented on where and how to use the university library to access R&I information for their businesses. The results are presented in Figure 37.

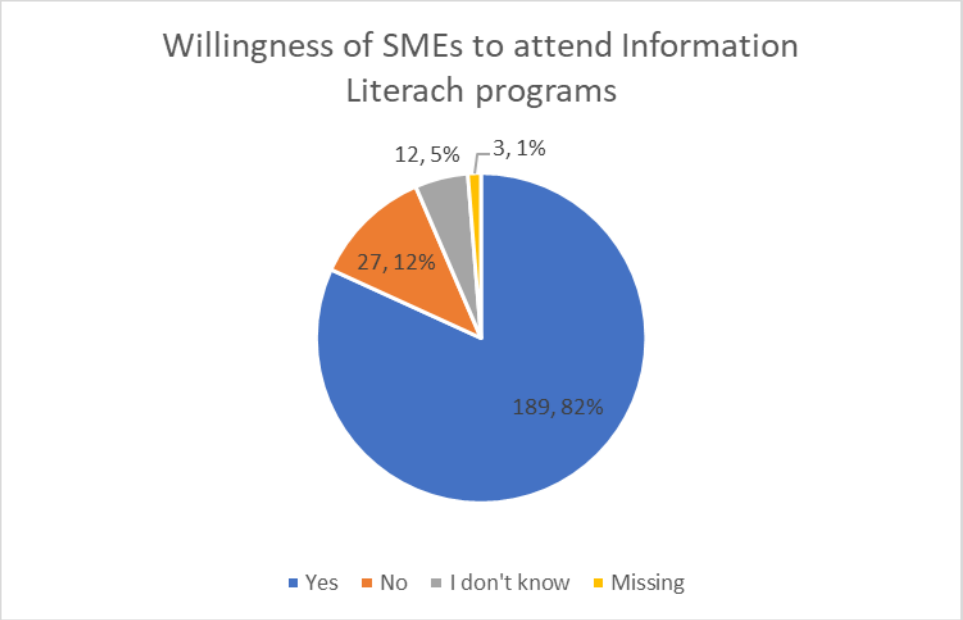


Figure 36: The SMEs' need for University Library information literacy programs (n=231)

The results in Figure 37 above, show that 189 (81.8%) of the respondents were comfortable with the idea of university libraries conducting for them information literacy programs, 27(11.7%) respondents did not like it and 12 (5.2%) respondents did not know. In the light of the above, one interviewee defended this approach and noted that:

> *"The library is carrying out community engagement programs in Buvuma Islands. Now most of these people are fishermen and semi illiterate, so we are also planning to carry out information literacy programs for these communities. Through this, we hope to equip them with skills to help in accessing the library resources." (Female University Library).*

5.4.3 Utilisation of R&I Information

SMEs were asked to give examples of how they utilise the R&I information they access from the library as well as other sources. The systems approach theory came alive in this section as the responses of the study were directly applicable to the element of decision analysis, as a linking process and a factor that influences the utilisation of R&I information. Many views raised are presented in Table 50.

Table 50: The different ways SMEs utilise the R&I information they access (n=231)

S/No.	Forms of utilisation	Frequency	Percent
1	Analysing business situations and making appropriate business decisions	47	24.2
2	Application of different farming technology	31	16.0
3	Growing the business	27	13.9
4	Beating competitors	22	11.3
5	Implementing better strategies of running business	14	7.2
6	Developing new products that consumers need/ Improve business products	13	6.7
7	Establish better systems of running business	11	5.7
8	Solving business problems	10	5.1
9	Notifying suppliers of required modern products	8	4.2
10	Supervising and evaluation of branches/ improving communication	5	2.5
11	Training staff members	2	1.0
12	Treatment of birds/ animals	2	1.0
13	Enforcing strategic goals and directions of the business	1	0.6
14	Conducting demonstrations for customers	1	0.6
	Total	**194**	**100.0**

The results from Table 50 above show that 47 (24.2%) of respondents use it for analysing business situations and making appropriate decisions, 31 (16%) respondents use R&I information for applying modern technology and 27(13.9%) use it for growing their business enterprises. The least reasons of using R&I information were enforcing business strategic goals and directions and also conducting demonstrations for their customers where each stood at a frequency of 1 (0.6%).

The researcher further sought to know whether there were SMEs that had utilised R&I information and helped them to come up with their own unique and local innovations. The results are presented in Figure 38.

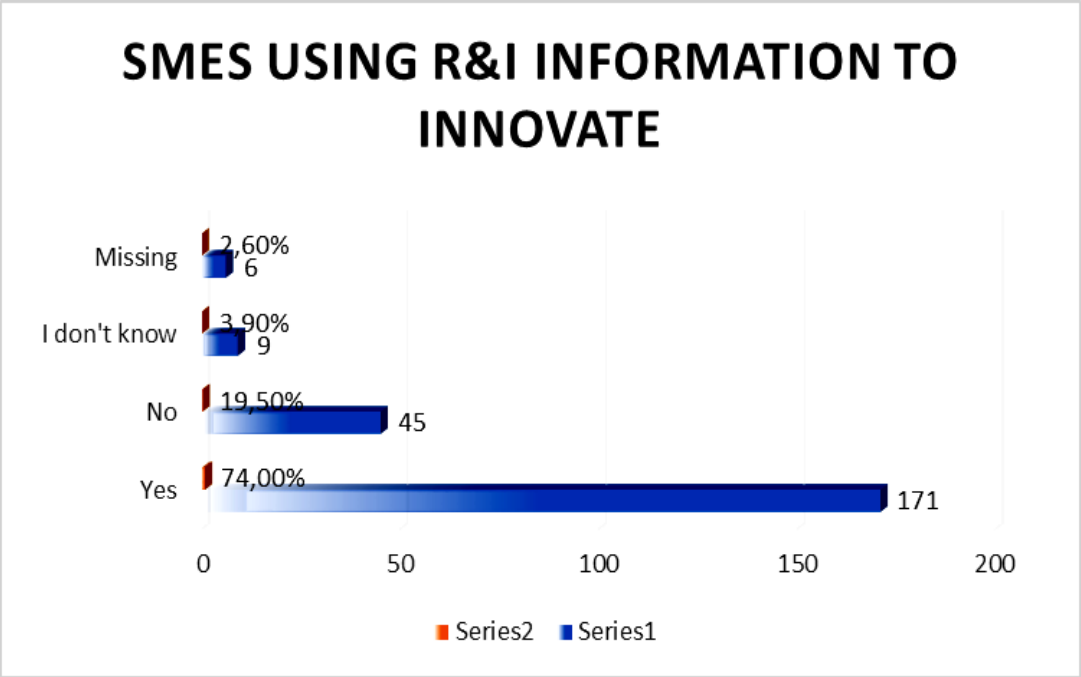


Figure 37: SMEs which use R&I to create their own innovations(n=231)

The results in Figure 38 above reveal that 171 (74%) of SME respondents had utilised R&I information which enabled them to come up with their own unique innovation, 45 (19.5%) of them had never developed any innovation out of the R&I information they were accessing and utilising, 9 (3.9%) respondents did not know and 6 (2.6%) missed this question. Among those respondents who were innovating as a result of using of R&I information, there was one respondent from a medium sized company dealing in seeds who set up demonstration farms as illustrated in Figure 39. This respondent added:

> *"Out of the R&I information we access, we were able to come up with a marketing strategy for our products. We discovered that farmers respond well to our products after seeing how the products perform in demonstrations sites. So we mapped the country and divided it into 12 zones where in each zone we set up our own extension officer. Each officer was tasked to set up demonstration farms in their regions thus making up 12 demonstration farms scattered around the county. Through this innovation, the farmers were able to believe by seeing the efficacy of the company's products and this has greatly increased the sales of our products." (Male SME respondent's demonstration farm picture, Figure 39).*

Figure 38: A demonstration farm for cabbages.

Another firm outsourced an IT firm to develop an information system powered by the Geographical Position System (GPS). Through this, the company is able to monitor all their operations in the field in the different parts of the country which drastically reduced the costs of supervision and fuel costs for field visits. Another respondent from Mukono district explained that as a result of the R&I information he was accessing, he was able to come up with an innovation of a cage suitable for urban poultry farmers. It takes up a small space, does not waste animal feed like in a deep litter system and the cage can be kept clean by easily removing the chicken dung from under which is used later as fertilizers for a home vegetable garden. A picture of this locally made poultry cage is shown in Figure 40.

Another respondent used R&I information to engineer how to irrigate his vegetables using usual water bottles as shown in Figure 41. Through this innovation, he is able to regularly supply vegetables to his customers both in the rainy and dry seasons.

Figure 39: Local innovation of a cage made for urban poultry farming

Figure 40: Drip irrigation using usual plastic water bottles

There are many other examples of innovations developed as a result of accessing and utilising R&I information mentioned by respondents which have been summarised in Table 51.

Table 51: SME innovations engineered from R&I information(n=231)

S/No.	Type of innovation	Frequency	Percentage
1	Developed new and better products for customers like pumpkin wine, direct selling to customers without using agents, distribution of new lines of products through demonstrations, enabled the best customer referrals, identifying customer needs, developed multiple products like from producing animal feed, we added fish feed, developed new packaging different from competitors	33	20.6
2	Issuing cash discounts as opposed to credit facilities/ developed credit issuance forms to allow different modes of payments, Use of mobile money and cheque payments	27	16.9
3	Developed new formulas for animal feeds/ improved on the animal feeds to increase yields	24	15.0
4	Registered company on most SM sites like Facebook, Twitter and Whatsapp, using SM to offer advisory services, improved feedback from customers	19	11.9
5	Awarding best performing employees from time to time	13	8.1
6	Electronic book keeping, Electronic Information Management	13	8.1
7	Developed our own bird vaccination	7	4.4
8	Carrying out more internal audits to reduce fraud and theft	6	3.7
9	Developed our own animal feeds milling plant	5	3.1
10	Developed drought resistant varieties/ developed hybrid seeds	3	1.9
11	Designed our own Solar Hatcheries	3	1.9
12	Developed effective and comprehensive information to beat our competitors	2	1.3
13	Developed new and effective techniques of applying agro chemicals	2	1.3
15	Moved from labour intensive to mechanical agriculture	1	0.6
16	Studying of weather patterns	1	0.6

17	Physical visits to customers	1	0.6
	Total	**160**	**100.0**

The results show that SMEs are using R&I information to innovate, for example 33 (20.6%) of the respondents used R&I information to create new and improved products for their customers, 27 (16.9%) used R&I information to engineer new payment modes with their customers, 24 (15%) created new animal feeds formulas for their animals. The least innovations were switching from manual to mechanical production, interpreting the weather and conducting physical visits to their customers where each scored one frequency (0.6%).

The researcher further wished to know the impact of adopting these innovations on the businesses of the respondents. The results are depicted in Table 52.

Table 52: Impact of adopting local innovations on SME businesses (n=231)

		Responses		Percent of Cases
		n	Percent	
Impact of adopting innovation[a]	Improved business growth	81	19.6%	62.8%
	Invented new technology	18	4.3%	14.0%
	Increased sales	75	18.1%	58.1%
	Increased productivity	57	13.8%	44.2%
	Increased profitability	54	13.0%	41.9%
	Improved customer satisfaction	63	15.2%	48.8%
	Beat competitors	39	9.4%	30.2%
	Promoted entrepreneurship	27	6.5%	20.9%
Total		414	100.0%	320.9%

a. Dichotomy group tabulated at value 1.

As illustrated in Table 52 above, the leading impact of adopting these innovations on the businesses as revealed by 81(19.6%) of the respondents was improved business growth as a result of adopting these innovations, 75 (18.1%) experienced increased sales and 63 (15.2%) respondents experienced better customer satisfaction. The least impact was of inventing new technology (18, 4.3%).

This study was further interested to know how sustainable these innovations were after adopting them. Table 53 below presents the views of the agricultural SMEs.

Table 53: The sustainability of adopting local innovations among SMEs (n=231)

S/No.	How sustainable were the adopted innovations	Frequency	Percent
1	Easy and simple to sustain, They do not require a lot of resources to implement	37	88.1
2	Fairly sustainable	3	7.1
3	Expensive, it needs regular updating at least every two days	2	4.8
	Total	**42**	**100.0**

The results indicated in Table 53 above show that most of the respondents (37, 88.1%) found adopting these innovations simple and easy, 3 (7.1%) rated it fair, while 2 (4.8%) found it difficult and expensive to sustain. The researcher also sought to know whether the SME respondents faced barriers or difficulties, while applying or adopting these innovations. The results are presented in Figure 42.

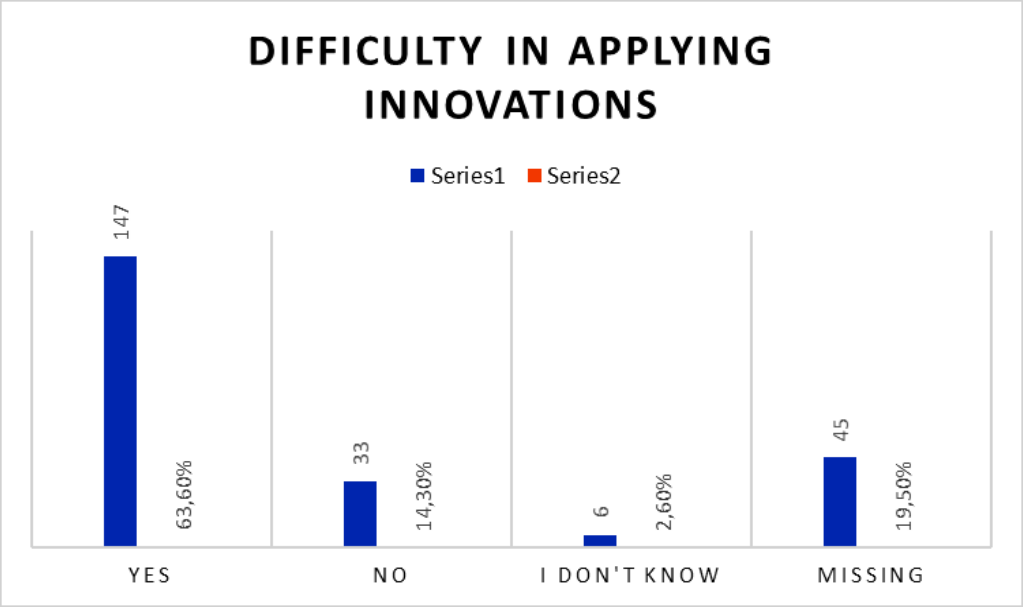


Figure 41: SMEs which face difficulties when applying innovations (n=231)

As indicated by the results in Figure 42 above, though a small number of the SMEs found it easy to sustain the innovations, these SMEs did experience difficulties in applying and adopting innovations. This is revealed by 147 (63.6%) of the respondents who experienced difficulties, 33 (14.3%) didn't experience any difficulties, 6 (2.6%) respondents were not quite sure and 45 (19.5%) were non-committal.

Owing to the fact that quite a number of respondents were experiencing difficulties in sustaining innovations engineered from the R&I information they accessed, the researcher asked them to mention examples of such difficulties. The results are provided in Table 54.

Table 54: Difficulties found in applying innovations (n=231)

S/No.	Difficulties in adopting innovations	Frequency	Percent
1	Heavy taxes and high costs of the raw materials used in the new innovations, high financial implications, price fluctuations, high forex rates for imports	23	28.9
2	Rigidity of clients towards new innovations, not easy to market new products, slow adoption by customers	17	21.4
3	Stiff competition in business, duplication of our products, counterfeiting our new innovations	12	15.0
4	Shunning of higher prices that comes with the new innovations	7	8.7
5	Continuously teaching the final users how to use the new products	6	7.5
6	Changes in climate, changes in farming seasons affecting new innovation (new varieties),	5	6.2
7	Difficulties in quality maintenance of new innovations	3	3.5
8	Bad roads inhibit visits to customers	2	2.5
9	Negative effect of innovations (new agro chemicals) on the environment	2	2.5
10	Unfavourable government policy for new innovation (Mechanisation)	2	2.5
11	Victimisation by stakeholders involved in the innovation	1	1.3
	Total	**80**	**100.0**

As demonstrated by the results in Table 53 above, the leading difficulty SMEs face while sustaining innovations was the high financial implications as stated by 23 (28.9%) respondents, 17 (21.4%) complained of the rigidity of clients to adopt their new innovation, while 12 (15%) raised the issue of competitors always counterfeiting/copying their new innovations. The difficulty least mentioned was the one of victimisation by stakeholders which was mentioned by one (1.3%) respondent.

Since the issue of financial implication was the highest mentioned difficulty, the researcher inquired from the respondents whether they were aware of banks and other financial institutions which offer flexible agro based loans and leases to farmers and agro-based enterprises. The results are shown in Figure 43.

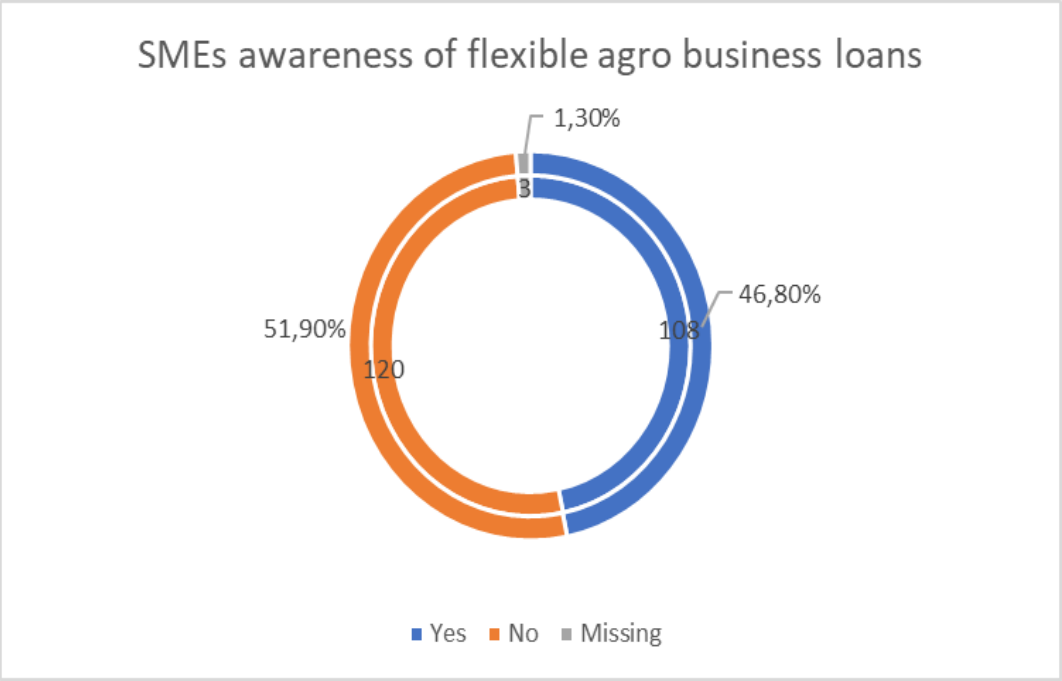


Figure 42: SMEs' awareness of flexible agro based loans and leases (n=231)

It can clearly be seen from the results in Figure 43 above that slightly more than half of the respondents (120, 51.9 %) were not aware of these flexible agro loans and leases, 108 (46.8%) of the respondents were aware of them and 3 (1.3%) skipped this question. Among those SME respondents who indicated that they were aware of these flexible agro loans and leases, the researcher inquired whether they had taken advantage of these loans. The results are shown in Figure 44.

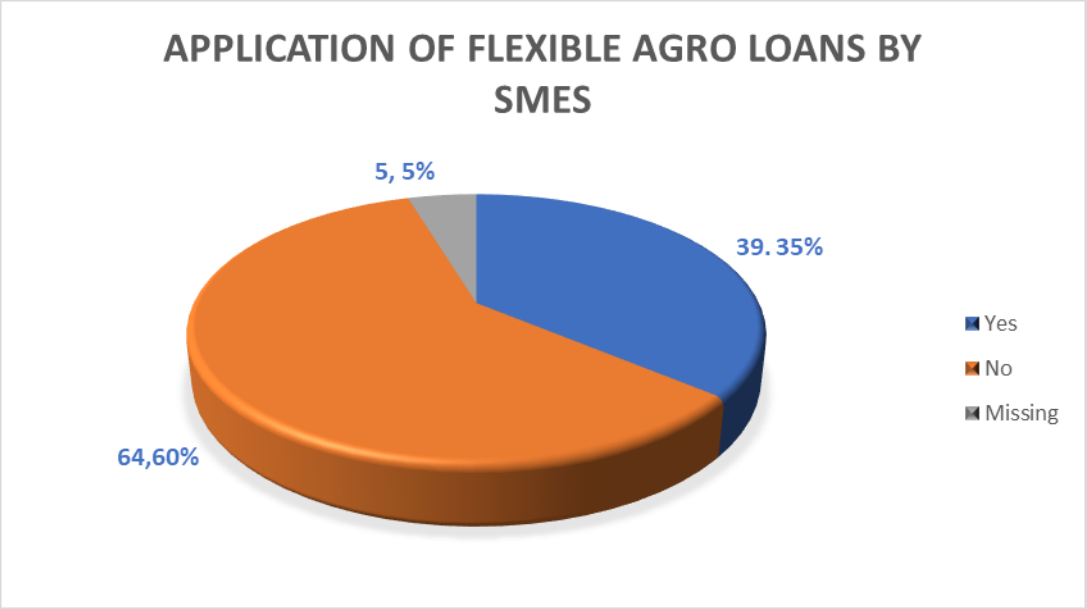


Figure 43: Application of flexible agro based loans and leases (n=108)

As seen from the results presented in Figure 44 above, even though these respondents were aware of these flexible agro-based loans, the biggest percentage of the respondents (64, 59.2%) had never taken the trouble to apply for these loans, only 39 (36.1%) had applied for them. Five (4.7%) of the respondents were non-committal.

The researcher asked for explanations of the statistics above. Starting with the negative ones, they raised a number of reasons. The results are provided in Table 55.

Table 55: Reasons SMEs do not apply for the flexible agro based loans (n=64)

S/No	SME negative experience towards flexible agro based loans	Frequency	Percent
1	Complicated process of applying, bureaucratic process, the loans are not flexible with the changing farming seasons, they give unfavourable terms and conditions, involves a lot of dynamics	19	29.7
2	Business doesn't need any machinery at the moment, capital is sufficient for now, not interested, the company is financially self-sustainable	14	21.9
3	Charge high interest	10	15.6
4	I dislike pressure of bank loans, I do not believe in loans, not beneficial, loans are profit oriented and not helping farmers	9	14.1
5	Have not tried it yet, not yet reached us, No, still putting in place the necessary requirements Not accessed any yet	7	10.9
6	Not yet acquired sufficient information about it, Lack of proper knowledge on it	2	3.1
7	Too busy to apply for their loans, too busy to go there for more info	2	3.1
8	Not applicable to smaller enterprises	1	1.6
	Total	**64**	**100.0**

As tabulated in table 55 above, the leading cause SMEs do not take advantage of the flexible agro-based loans as revealed by 19 (29.7%) of the respondents was that they found the loan application process too complicated, bureaucratic and still unfavourable for farming; 14 (21.9%) stated that they were financially stable and do not need loans; 10 (15.6%) stated that they were afraid of the high interest rate, while one (1.6%) respondent felt that still these loans were not applicable to small enterprises.

The researcher later turned to the respondents who had applied and used these loans to share what their experience was; more so with regards to helping them sustain their innovations or

any business plan for their enterprises. They shared a number of experiences presented in Table 56.

Table 56: Positive experiences of SMEs who applied for the flexible agro based loans (n=39)

S/No	SME positive experience towards flexible agro based loans	Frequency	Percent
1	Boasted business, increased profits, they have been of great help	24	61.5
2	Used it to explore new business ideas which helped to expand business	11	28.2
3	Increased capital for the business	3	7.7
4	Applied for lease to acquire land to set up an agro processing plant at Namanve	1	2.6
	Total	**39**	**100.0**

It can be seen from the results in table 56 above that among the SMEs that found a positive experience from using these agro-based loans, 24 (61.5%) were boosted and the profits were increased, 11 (28.2%) managed to use these funds from the flexible agro-based loans to explore new ideas, 3 (7.7%) experienced an increase in the capital of their businesses and lastly, one respondent managed to use this lease to set up an agro processing plant at the industrial park in Namanve.

5.5 Factors and Perceptions that Influence R&I Utilisation in SMEs

This study sought to investigate the factors and perceptions that influence the utilisation of R&I information among SMEs. This was to address the fourth research question of the study which puts its emphasis on the utilisation of R&I information among SMEs. The new theories of management and the Wilson's 1999 model of Information seeking behaviour were used to frame the responses. This section therefore presents research findings of the SMEs' decision support mechanisms and the adequacy of the R&I information, and SMEs access.

5.5.1 SMEs' Business Decision Support Mechanisms

Before establishing whether they ever use R&I information to help them make key and strategic business decisions, the researcher wished to know how SMEs make key decisions

concerning their business enterprises. A number of views were raised by the respondents as summarised in Table 57.

Table 57: How SMEs make Strategic key decisions for their businesses (n=231)

S/No.	SME's business decision Support mechanism	Frequency	Percent
1	Based on demand from clients, decisions are customer driven and demand of new products, identify needs of customers and address them, involving customers, consulting customers	44	19.7
2	Depending on daily sales, market dynamics, deductions from market concepts,	39	17.2
3	Its profit driven, depends on the profits the business is making	27	11.9
4	Based on business environment, knowing the products on the market, knowing the right equipment to use	22	9.7
5	Through staff meetings,	20	8.8
6	Decisions informed by information from online sources and newspapers	18	8.0
7	Use my mobile phone to gather information from social media and websites	14	6.2
8	Identify challenges, increase competitiveness, form a practice approach to address challenges	14	6.2
9	Follow bottom to top management style of making business decisions	11	4.9
10	Attending workshops and discuss decisions about to be taken in meetings	6	2.6
11	Keeping track of competitors' activities	5	2.2
12	Looking at previous trends	3	1.3
13	System approach and professional governance,	2	0.9
14	We get advice from governmental bodies like National Drug Authority	1	0.4
	Total	**226**	**100.0**

The results in Table 57 above reveal three leading mechanisms that influence business decision making among the SMEs. In particular, 44 (19.7%) of the respondents stated that their decisions are influenced by the demands from their customers, 39 (17.2%) stated that the market dynamics are the ones that determine the business decision they make, 27 (11.9%) stated that their decisions are determined by the profit the business is or will be making. The least influence were governmental bodies mentioned by 1 (0.4%) respondent.

The researcher probed further to establish whether they use R&I information to inform or support their business decision making. This was in line with Wilson's 1999 model, under the satisfaction/dissatisfaction of information use. The results are presented in Table 58.

Table 58: How R&I information supports decision making in SMEs

S/No.	R&I Decision Support mechanism	Frequency	Percent
1	Discussing accessed R&I information in weekly meetings, carrying out research before taking a decision, conducting a thorough market research.	12	38.8
2	Consulting experts, engaging more experienced business partners, engaging professionals	7	22.6
3	Training customers and staff, conducting demos, supervising and auditing work done	5	16.1
4	Streamlined record keeping, collecting negative feedback from clients and discussing how to address it	4	12.9
5	Consideration of customer's tastes and preferences	2	6.4
6	Equanimity, shifting from rigidity to being open to new possibilities	1	3.2
	Total	**31**	**100.0**

The results revealed there were a few firms that would use R&I to inform their key business decisions. Among these, 12 (38.8%) carried out market research and other forms of research, 7 (22.6%) indicated that they engaged experts and other professionals to verify the R&I information accessed before making a key business decision, 5 (16.1%) used R&I to support their decision on training and supervision. The least mentioned was 1 (3.2%) respondent who used R&I information to explore and open up to new business possibilities.

5.5.2 Adequacy of R&I Information for SMEs

The respondents were asked to mention the indicators of the adequacy of R&I information they would like to access and utilise in their business. This was in line with the new theories of management, under the contingency approach which focuses on how organisation ought to take into account the prevailing environment such as the legal, political, technical and economic factors. The results are provided in Table 59.

Table 59: The adequacy of R&I information SMEs wish to access and use (n=231)

		Responses		Percent of Cases
		n	Percent	
Adequacy of R&I Information	Timeliness	111	18.6%	55.2%
	Accuracy of Information	129	21.6%	64.2%
	Information sharing platforms	102	17.1%	50.7%
	Functionality of formal R&I Sources	39	6.5%	19.4%
	Marketing of R&I information	63	10.6%	31.3%
	Financial aspects	57	9.5%	28.4%
	Policy & regulatory framework	6	1.0%	3.0%
	Open innovation	33	5.5%	16.4%
	Infrastructure	57	9.5%	28.4%
Total		597	100.0%	297.0%

a. Dichotomy group tabulated at value 1.

The results as displayed in Table 59 above, show the highest number of the SME respondents involved in this study: 129 (21.6%) wished that the R&I information they access should be accurate, 111 (18.6%) respondents wished that it is timely and 102 (17.2%) respondents wished that this R&I information should come in formats that is sharable on different communication platforms. Only a least number of respondents (6, 1%) were the ones who wanted it to be consistent with the existing policy and regulatory framework.

5.6 Challenges Faced in the Provision of R&I Information to SMEs

The fifth research question of this study focused on identifying the challenges that might be faced in the process of university libraries serving SMEs with R&I information. The modern theories of management, Libqual^{+TM} theory and Wilson's 1999 model of information seeking

behaviour model were used to frame the responses got from this question. This section presents research findings of the envisaged challenges and suggestions of how they can be resolved.

5.6.1 Challenges of Serving SMEs with R&I Information

The respondents (agricultural graduate students, SME respondents and agricultural academic staff) were asked to highlight challenges that might come up if Ugandan universities were to take this route of serving SMEs with the R&I information they collect and manage in their libraries. The results are presented in Table 60.

Table 60: Challenges of serving R&I information to SMEs (n=676)

S/No.	Challenge	Graduate students		SME respondents		Academic Staff	
		Freq	%	Freq	%	Freq	%
1	Poor library equipment	146	12.0	102	20.7	45	15.1
2	Poor funding and budget cuts	202	16.6	105	21.3	56	18.8
3	Low library staffing	126	10.3	0	0.0	22	7.4
4	Poor methods of disseminating R&I information	162	13.3	84	17.1	32	10.7
5	Poor reading culture	192	15.7	0	0.0	46	15.4
6	Lack of a proper policy framework	114	9.3	90	18.3	35	11.7
7	Inflexible library information systems	158	13.0	60	12.2	27	9.1
8	Lack of Infrastructure	120	9.8	51	10.4	35	11.7
	Total	**1220**	**100.0**	**492**	**100.0**	**298**	**100.0**

The results as provided in Table 59 show that if one takes the mean for the three percentages, the leading challenges expected in the execution of this task is shortage of funds and budget cuts (16.6% for graduate students, 21.3% for SME respondents and 18.8% for academic staff)

giving a total frequency of 363, this is followed by the challenge of poor university library equipment (12% for graduate students, 20.7% for SME respondents and 15.1% for academic staff) generating total frequency of 293 and the issue of poor methods of disseminating R&I information to SMEs (13.3% for graduate students, 17.1% for SME respondents and 10.7% for academic staff) with a total frequency of 278. The least mentioned challenge was low library staffing (10.3% & 7.4%) with a total frequency of 148. One interviewee lamented that;

> *"One thing that has worsened the plight of university libraries is the budget. The library receives budget cuts every year. However much the library lobbies and agitates for more funds, it is always side-lined and never considered as a priority by the top university management." (Female IT university official).*

There were also other challenges that could affect SMEs accessing R&I information from university libraries worth mentioning and these are stiff business competition, delays in information delivery, failure of innovations to work for farmers, lack or shortage of electricity to access the online university libraries, SMEs being less responsive to R&I information, as well as weakness and failure of testing innovations.

5.6.2 Suggestions

The respondents were asked to suggest solutions or strategies of how best to deal with the challenges identified above. The results are provided in Table 61.

Table 61: Suggestions of improving the delivery of R&I information to SMEs(n=676)

S/No.	Suggestions of improving the delivery of R&I information to SMEs	Frequency
1	Consider increasing funding for agricultural R&I information, initiate public private partnerships so that private business entities can fund this model, apply for grants to support this business idea, reduce on the taxation on equipment used to manage and disseminate R&I information	121
2	University libraries should design improved R&I dissemination system, digitalise R&I Information, restructure R&I dissemination methods, upload it on internet, use social media to ease access by external users	107
3	Government should create adaptable policies, guard against counterfeit, guard against agricultural products flooding the market, and regulate content on TV to be 70% local agro R&I information and 30% foreign.	89
4	University libraries bring SMEs together to share R&I information and experiences, promote information sharing among SMEs, conduct workshops and engage with related stakeholders, partner with, MAAIF, UCC, UN, FAO and WHO to promote more agricultural programming on the media	77
5	Equip libraries R&I information sources for SMEs	62
6	Educating the masses about the presence of R&I information in libraries	51
7	Agricultural schools should train agriculture professionals to do agricultural research with end users' input in order to guarantee their participation at implementation stage, introduce this idea as a module in agriculture course, introduce module in LIS curriculum, introduce this approach from primary education in science	47
8	Improve IT infrastructure to ease the dissemination of R&I information	39
9	Build international media platforms for sharing SME business ideas, connect with Radio, TV and social media to disseminate R&I information, engage even community radios	23
10	Repackage and simplify R&I information for SMEs, translate it into local languages, design computer apps that ease the dissemination of R&I information in easily accessible formats, repackage R&I information into brochures and fliers, audio formats, video formats, share R&I bulletins on social media,	17
11	University libraries should allow SMEs free access, university libraries should conduct regular visits to SMEs, reduce the cost of external library users accessing R&I information in university libraries	10
12	Establish a low cost research centre for agriculturists, universities should carry out research in high yielding and drought resistant varieties	9
13	Adopting mechanised agriculture	3
	Total	**604**

5.7 Summary

This chapter presented the analysed findings of the study. The findings were based on the five research questions for the study guided by three theories that underpin the study. The first section of the chapter presents the demographics which revealed an 87% response rate whereby there were more male respondents (68%) than females (32%). Most respondents were degree holders in the age bracket of 20-40 years; six universities and 231 SMEs were involved of which 77.1% SMEs were small enterprises.

The second section of this chapter dealt with the management of R&I information in university libraries which revealed that 78.2% of the respondents believed that the research they were carrying out could be beneficial to SMEs, mainly in areas of increasing the SMEs productivity, identifying training opportunities and starting up new business ventures. Most of the R&I information services were assessed focusing on employee relations, library systems and the university library as a place and most respondents rated them to be fair. With regard to the value respondents attach to university libraries serving SMEs with R&I information, 78% of them had a high or positive value towards this idea. Over 68% of the respondents wished that the best platform of disseminating R&I information to SMEs should be through institutional repositories. A statistical test was done to test the relationship between the variable of respondent's assessment of the university library as a gateway space for research and innovation with the variable of whether the research respondents were doing what was beneficial to SMEs. The result showed that there was a significant relationship between the two variables.

The chapter also reported on how half of the SMEs involved in this study belonged to professional networks and how 63.6% of them would access R&I information from these professional networks for their businesses. Over 80% of the SMEs had negative comments about NAADS, a governmental body that disseminates large R&I information to farmers. A third of the respondents believed that currently university libraries do not have an enabling environment for SMEs to settle and access R&I information mainly because of inaccessible formats in which R&I information is packaged. It was from this premise that 80% of the respondents stated that university libraries needed to re-engineer their R&I information services if they are to serve SMEs better. This should be mainly through digitisation, carrying out community engagement programs targeting SMEs and repackaging R&I information. They added that R&I information should be repackaged mainly from print to short

documentaries, newsletters, using social media, translating it from English to local languages, broadcasting it on radio and TV.

The results revealed that 87% of the SMEs had R&I information needs, yet 70% of them had never used a university library in the recent past. They were however willing to be trained and equipped with skills of accessing and using the library R&I information. It was also noted that 74% of SMEs were using R&I information to come up with their own innovations and others were also using R&I information when making key business decisions. They also indicated that the factors considered to access adequate R&I information among them was accuracy, timeliness and ability for the information to be sharable.

The last section of this chapter presented the challenges envisaged in the dissemination of R&I information to SMEs in which the leading included shortage of funding or budget cuts, inadequate library equipment and poor methods of disseminating R&I information. The respondents also raised some suggestions and strategies of improving the dissemination of R&I information among SMEs.

The next chapter discusses the findings of the study using extant empirical and theoretical literature.

CHAPTER SIX

DISCUSSIONS OF FINDINGS

"Let us go and invent tomorrow instead of worrying about what happened yesterday"
Steve Jobs

"Never be so aware of the storm and you loose the awareness of God in the storm"
T. D. Jakes

6.1 Introduction

This chapter provides a systematic interpretation and discussion of the research findings reported in the previous chapter. The interpretation and discussion of the main findings of the study provides meaning and better understanding to the research data and integrates it with other related studies (Stangor 2015; Ofulla 2013). The interpretations and discussions follow the sub-themes of the study as drawn from the research questions and the three theories used to underpin this study.

The purpose of this study was to investigate how university libraries in Uganda repackage and disseminate research and innovation information generated in universities to Small and Medium Enterprises (SMEs) for use in their entrepreneurial programs. The following research questions were addressed: (i) What are the R&I information services provided by university libraries to SMEs in the agricultural sector in Uganda? (ii) How can the R&I information sources and services in university libraries be re-engineered to serve SMEs better? (iii) What skills and competencies are needed by SMEs to effectively access and use R&I sources and information services? (iv) What factors and perceptions influence access and utilisation of R&I information sources and services by SMEs? (v) What challenges are faced by university libraries in providing R&I information sources and services to SMEs?

This chapter is divided into ten main sections: section 6.1 introduces the chapter; Section 6.2 discusses the demographics of the study; section 6.3 interprets and discusses the research findings that relate to the management of R&I information services in university libraries; section 6.4 covers the different ways the R&I information services can be re-engineered to serve SMEs better; section 6.5 deals with the access and utilisation of R&I information by SMEs; section 6.6 discusses the factors and perceptions that influence the utilisation of R&I

information by SMEs; section 6.8 discusses the challenges of serving SMEs with R&I information; and finally section 6.9 interprets and discusses the suggestions raised by respondents on how to address these challenges and improve this service, while section 6.10 is the summary.

6.2 Demographics of the study

This study collected demographic details of the respondents to describe the characteristics of the sample or the participants of the study. Connelly (2013) posits that demographic data of research study is vital and must be examined carefully. In this section, the discussion includes: gender, age, educational qualification and years of existence of SMEs among others.

6.2.1 Response Rate

This study achieved an 82% response rate which is statistically considered to be representative enough for any population of a study (Johnson & Wislar 2012). The goal of any researcher is to attain a response rate which is equal or higher than 60% for a study to be considered valid, reliable, and free of bias (Fincham 2008). The students' response rate (82%) was higher than that of the academic staff members (60%). This contrasts with a similar study carried out at Catwba colleges in North Carolina where the response rate of academic staff (62.82%) was far much higher than that of the students (9.95%). This was attributed to the fact that the staff members use the library more than students (Harer 2006). The results from Uganda may suggest students use the library more than the academic staff. This is a grave anomaly because the reverse is supposed to be true where academic staff use the library more than the students. The researcher was further able to reach all the interviewees whose response rate was 100%. The interviewees shared deep insights on the subject of university libraries serving SMEs with R&I information.

6.2.2 Gender

This study had more male (472, 68%) than female (222, 32%) respondents. As highlighted earlier, the greater number of men in this study could be attributed to the gender imbalance in Uganda existing in different scientific disciplines like agriculture and the need for more women empowerment in this area. This imbalance it seems, is not only a Ugandan issue but has been reported by different other scholars around the world. Ayadi et al. (2017:40) did a study on SMEs in Jordan and found that the participation of the female labour force is far

lower than that of the male. “Female unemployment rate averaged twice as much as the male counterpart, approximately 21% as compared to 10% respectively”. Like in Uganda, this result suggests a gap between the share of SME jobs created for male and for female workers. Owusu-Ansah (2013) carried out a similar study in West Africa at the University of Ghana, Legon, and out of a population of 154 respondents, 91 (59.0%) were males and 63 (41.0%) were females. This result emphasises the need for women empowerment to address this gender imbalance both in the scientific academic programs and in the market place.

6.2.3 Age Profiles of Respondents

The age of respondents revealed that the majority of the respondents (548, 78.9%) were between the ages of 20-40 years. This is not far from what is reported by Buwande (2014) that Uganda’s population is 35 million of which 77% are below 30 years of age. Other related studies have been carried out. For example, Asemi, Kazempour & Rizi. (2010) carried out a similar study involving universities in Iran and over two-thirds (69 %) of respondents fell into the category of 18-22 years old. Another study was on SMEs in Kenya where Gogi (2017:47) reports that “127 (41.78%) respondents were between the age of 31-40 and they were the majority”. This and quite a number of official statistics indicate that Uganda and other Sub-Saharan African countries have a young population (Asiimwe et al. 2014; Ssengonzi 2009; Klasen & Lawson 2007) which is energetic and should be supported in terms of enterprise funding. Governments ought to take advantage of this youthful population by bolstering their entrepreneurial support through supplying them with adequate information on research and innovation.

6.2.4 Level of Education of Respondents

The respondents’ levels of education indicate that most of them (455, 65%) were degree holders. This result was peculiar because even among the SME respondents, 151 or 54% were graduates and 40 or 17.3% had post graduate qualifications contrary to common belief that some practitioners in SMEs have lower education qualifications. The least number of respondents were primary school leavers standing at only 5 (0.7%). The study did not encounter any respondents with no education. In a similar study on how public libraries promote SMEs in Zimbabwe, 60% of the respondents had bachelor’s degrees and 20% had post graduate qualifications (Kazingizi 2017). In another study on SMEs of women in Kenya, 42% of the respondents had secondary education qualifications, 32% had diplomas and 14% were graduates (Gogi 2017). In all these recent SME studies of Uganda, Zimbabwe and

Kenya, none of the respondents lacked education qualification. This result suggests that long gone are the days when Uganda and Sub-Saharan Africa grappled with low literacy levels in the informal sector where most SMEs operate. Therefore, both university and public libraries can strategically position themselves and implement interventions that can support SMEs with information for business development without worrying about their low literacy levels.

6.2.5 Universities Surveyed

A total of six universities were surveyed. The highest number of respondents were from Makerere University of whom 51% were academic staff and 81.7% graduate students. This result may be attributed to the fact that Makerere is the oldest university in Uganda. The least numbers of respondents were from Ndejje University of whom 3.8% were academic staff and 2.5% graduate students who recently had post graduate agricultural programmes there. In a recent study on university libraries in central Uganda, it was found that among the 22 universities involved, the most active and leading response rates were from Makerere, Kyambogo, UCU, UMU and Ndejje university respectively (Acanit 2016). This result suggests that apart from advancing the agenda of agriculture, these same universities are also excelling in other areas like ICT adoption. Notably, Gulu University is missing in Acanit's study probably because it is not located in the central region of Uganda.

6.2.6 SME Sizes

The respondents from SMEs were asked to indicate the size of their enterprises in terms of the number of workers and their total asset worth. Findings from the study showed that most respondents' enterprises (178, 77.1%) were small, while 53 (22.9%) respondents' enterprises in the study were medium. To distinguish the two, the researcher mainly used two parameters: the number of workers and the enterprise's total asset worth. Those with 5-50 workers with a total asset worth not exceeding 360 Million Ugandan Shillings were categorised as small enterprises, while those with more than 50 workers and total asset worth of 360 million to 30 billion Ugandan shillings as medium enterprises. These statistics have not changed significantly because FSD et al. (2015) in a survey of small businesses in Uganda found that the small businesses were 18.4%, while the medium business enterprises were 11.5% respectively. Earlier, the Uganda Bureau of Statistics (2011) found that Small business enterprises were 20%, while Medium enterprises were 10%. In all these three surveys, there were no large-scale enterprises. Comparatively, in a recent study in Zambia

findings revealed the country had 23.3% small, 6.7% medium and 3% large business enterprises respectively (Kambone 2017:41-42).

In order to ascertain the mortality rate of agricultural SMEs in the central region of Uganda, the researcher asked respondents to indicate how long they had been in operation. Contrary to popular belief, the highest number of agricultural SMEs (45, 19.5%) have been in operation for more than twelve years. Such firms are suitable for linkages with strategic entrepreneurship research, since they have defied the norm and survived the harsh business environment that has caused many others to collapse even before their inception. Lechner and Pervaiz (2018:152) posit that specific strategic entrepreneurship research is needed on how companies that have stabilised for around ten years have managed to become "more flexible, act faster, more alert to opportunities and able to organise opportunities of exploitation in the face of uncertainty.

This was followed by 38 SMEs (16.5%) made up of those which have existed for 1-2 years. Compared to related studies in the region, a study of women SMEs in Kenya found the highest number of SMEs (62.5%) to have been in existence between 3-5 years followed by 19% that had existed between 6-10 years (Gogi 2017:49). In Zambia, the highest number of SMEs (53%) were found to have been in existence between 6-10 years followed by 37% of SMEs that had been in existence from 1-5 years. In a nutshell, though the SMEs' mortality rates have slightly improved, it is worrisome that a large number of SMEs in Uganda and the Sub-Saharan region in general survive for between 1-5 years.

6.3 Management of R&I Information in University Libraries

Kayongo and Jones (2006) emphasise the need for libraries to conduct comparable assessments of their information services with peer institutions. In this study, six peer Ugandan universities with postgraduate agricultural programmes were assessed. Such comparable peer assessments help in understanding better the local library information services, resources and identification of best practices. For example, in this study, it was clear what the agricultural academic staff and graduate agricultural students felt about the research they were doing and how it benefits or meets the entrepreneurial information needs of SMEs. Over 61% of both the academic staff and students indicated that their research could meet the SME R&I information needs. Despite the fact that no academic staff felt that their research could not meet SME R&I information needs, 13% graduate students felt that their research

could not meet SME R&I information needs. This kind of research could probably be desk research, focusing on reviewing theoretical models and concepts.

6.3.1 University Libraries R&I Information Sources

One of the theoretical frameworks underpinning this study is Wilson's (1999) model of information seeking behaviour. Wilson's model emphasises the need to explore the users' information needs to allow the information providers to conceptualise users as "socially constructed entities" (Seyama et al. 2014:5). This perspective was important for this study because agricultural SMEs tend to be personalised, often very specialised in their kind of business. Given that 61 % of both the academic staff and graduate students in this study revealed that their research could meet some of the information needs of SMEs, the researcher sought to know examples of the different SME information needs. Both the academic staff and graduate students stated that their research works would highly contribute to increasing the productivity of SMEs (25.7% & 22.9%) and investment opportunities (13.6% & 9.2%) respectively. Identification of investment opportunities is one of the key factors of entrepreneurial orientation. According to Lechner and Pervaiz (2018:150), entrepreneurial orientation is understood as a strategy of creating competitive advantage through identifying new investment opportunities characterised by "innovativeness, pro-activeness, risk-taking, competitive aggressiveness, autonomy and facilitating the pursuit of opportunities". Therefore, the research done in university is relevant to support SMEs in identification of investment opportunities and increase of their productivity.

6.3.2 University Libraries R&I Information Services

Like the Purdue libraries which used the LibQUAL+^{TM} to inform the library's strategic planning (Saunder 2008), this current study also used the LibQUAL+^{TM} to explore how the university libraries were providing SMEs with R&I information. In this section, the researcher discusses the LibQUAL+^{TM} results entailing the quality of library employees in relation to serving SMEs, the capacity of library systems in serving SMEs, most especially those SMEs which are to access the library remotely, and library as a place that is conducive for SMEs to come and learn and also to innovate for their business enterprises.

6.3.2.1 Assessment of the Quality of University Library Employee Relations

The academic staff were asked to evaluate the university library employee relations and rate how they instil confidence in their users, while serving them. Instilling confidence is one of the library user's expectation under the service affect dimension of LibQUAL+^{TM}. Research

in entrepreneurship has proven that feelings and emotions greatly influence entrepreneurs' actions. Consequently, if entrepreneurs come to the library and they are made to feel positive this promotes "creativity, discovery, exploitation of opportunities, acquisition of R&I information resources and other important activities" needed in launching or venturing into a new business idea (Eller & Gielnik 2018:171).

The results established that 44.9% of the respondents found university library employee relations in instilling confidence in users to be fair, while 42.3% of the respondents considered them to be good. Only 7.7% of the respondents felt that they were very good. None of the respondents felt that the library employee relations were poor or very poor at instilling confidence in users. At Notre Dame and other ARL university libraries in United States of America, a similar study was done and this variable scored an adequacy gap of 0.81 (Kayongo & Jones 2006), while at Catawba colleges in Canada it was at 0.68 (Harer 2006). The service adequacy gap is calculated by subtracting the minimum score from the perceived score of any given question. In other words, if the score is positive, it is an indication that librarians are instilling confidence that meets the minimum standards of their users. However, when the score is negative, it means that the librarians have scored below the minimum perceived level of service quality and therefore such areas need urgent improvement. Based on these scores, it can be seen that just like at Notre Dame and Catawba colleges, the Ugandan university libraries are just at the margin of meeting the minimum expectations of instilling confidence in library users. Ugandan university libraries therefore need to identify such areas that require improvement as far as instilling confidence to SME users when serving them is concerned. The areas that need improvement include being courteous, polite, respectful and caring (Ladhari & Morales 2008).

The study wished to establish the rate at which the university library employees give individual attention to users. The results obtained from academic staff revealed that over 73% of the respondents rated the university library employees to be good, 24% rated them fair, while only 3% found them to be very good. None of the respondents felt that they were poor or very poor at giving individual attention. At Notre Dame and other ARL university libraries, a similar study was done and this variable scored an adequacy gap of -0.73 (Kayongo & Jones 2006). A similar study was carried out on Canadian libraries by Ladhari and Morales (2008). They found a positive and significant correlation between perceived service value and library employees giving individual attention of 0.466, where the p value was less than 0.01. This indicates that the Canadian and Ugandan university librarians are

doing better than those of Notre Dame who scored less than the minimum expectations of the users as far as giving individual attention to users is concerned.

The academic staff were further requested to assess the readiness of university library employees to respond to users' questions. The highest number of respondents (44.9%) rated them fair, 26.3% rated them good, 23.7% felt they were very good and 5.1% of the respondents felt that the library employees' response to user questions was poor. At Notre Dame and other ARL University libraries, a similar study was done and this variable scored an adequacy gap of -0.71 (Kayongo & Jones 2006). The results seem to suggest that while the readiness of Ugandan university library employees in responding to users' questions was fair, the one of Notre Dame and ARL university libraries was below the user's minimum expectation.

Therefore, based on the general way Ugandan university library staff treat the academic staff and students, SME patrons should not find a problem with the university library employee relations if they are to come searching for R&I information for their business enterprises.

6.3.2.2 Assessment of University library systems

Gastinger (2006:4) posits that university libraries ought to provide "effective stewardship of both digital and physical collections. Digital and physical collections are part of the library user needs under the information control dimension of LibQUAL+™. According to this study, 40.3% of the graduate student respondents felt that print and journal R&I information in university libraries was fairly easy to access. At Notre Dame and other ARL University libraries, a similar study was done and this variable scored an adequacy gap of -0.85 (Kayongo & Jones 2006), while at Catawba Colleges it was at 0.17 (Harer 2006). A comparison of all these statistics shows that Ugandan universities are trying to provide effective leadership as far as ensuring easy access to print and journal R&I information. This result confirms what Ladhari and Morales (2008) discovered that there is a positive and significant correlation between perceived service value and ease of library users finding print and journal collections of 0.38, where the p value was less than 0.01.

Graduate students were also asked to indicate whether the university library systems help them to stay abreast with the current trends in their fields of interest. This assessment used a five level Likert scale of strongly disagree, disagree, undecided, agree and strongly agree. The highest number of respondents (172, 46.9%) stated that they agree, followed by those who strongly agreed. In contrast, graduate students of Purdue libraries were different from

the Ugandans as 63.5% of them showed some dissatisfaction with information control of their library systems (Saunder 2008).

The researcher wanted to know whether the university library aids the graduate students in any way as they pursued their academic dreams. More than half of the respondents (224, 61%) agreed that the library aided their professional academic advancement, another 77 (21%) strongly agreed. When this is compared with the average score of Rhodes University, it is seen that this service of aiding graduate students to pursue their academic dreams is done slightly above average both in Ugandan universities and Rhodes University and the other six South African universities with their means ranging from 5.75 to 6.72 (Moon 2007).

Gastinger (2006:4) pauses a serious question and wonders how university libraries can serve the needs of the generation of end users who use the "world wide web as their primary source of information and knowledge". This question is posed because some libraries are still offering manual and face to face services, yet their potential users expect to be served via the world wide web. The results from the current study revealed that 35.1% of the respondents stated that they accessed the library web page occasionally, 27.8% of the respondents accessed it rarely and 10.9% of the respondents had never used it. There was a handful of 17.4% respondents who accessed the library website daily and another 22.6% respondents who accessed it all the time. At Notre Dame and other ARL university libraries, a similar study was done and 50% of the users indicated that they used university library website all the time, 40% used the library website daily, 5% used it occasionally and only 5% have never used it (Kayongo & Jones 2006). Elsewhere at the Rhodes University, the frequency of use of the library website whether remotely or onsite was found to be average (Moon 2007). Ugandan university libraries have to pull up in this area and design library websites that are attractive and easy to navigate if they are to increase the number of SME visitors and users to their library web pages.

When the results of the Ugandan university libraries are compared to the one of Catawba Colleges that also used LibQual+TM, it is found that the library users there also had a gap in accessing resources from home (Harer 2006). The main cause of this was the use of passwords. Catawba Colleges responded by identifying a proxy server and suspended the use of passwords. This can also be replicated by Ugandan university libraries when serving SMEs as it might be cumbersome for SMEs to memorise or work with these passwords for e-resources and databases.

The study sought to know how often the respondents used non-library gate ways like Google and Yahoo to access R&I information. The results revealed that 204 (55.6%) of the respondents stated that they use non-library gate ways all the time, 133 (36.2%) used non-library gateways daily, 14 (3.8%) used them occasionally and only 2 (0.5%) never used them. At Notre Dame and other ARL university libraries, a similar study was done and 80% of the users indicated that they used non-library gateways all the time, 15% used non-library gateways daily, 3% used them occasionally and 2% never used them (Kayongo & Jones 2006). This result could explain why subject librarians in some universities are continually being considered "worthless compared to internet" (Gastinger 2006:4). Nonetheless, university libraries should not give up because libraries have an advantage of the ability to offer reliable, evaluated, tested and proven R&I information compared to the R&I information from the non-library gateways.

6.3.2.3 Assessment of University Libraries as a Place

The third dimension of LibQUAL+^{TM} is "Library as a place" where the quality of the library spaces are assessed (Thompson 2004). The researcher was therefore interested to know how the University library as a place inspired the users as far as studying and learning was concerned. The results from graduate students revealed that 153 (41.7%) felt that the university library spaces were fairly inspiring them to study and learn. In a similar study done at Catawba colleges, this variable scored a miserable adequacy mean of -0.20 (Harer 2006). In contrast, Ugandan universities at least scored better than the college libraries of Catawba as far as libraries inspire users in studying and learning. Nevertheless, to increase this percentage, Gastinger (2006) advises that the university library as a place, should have relevance to users where they attach a high value to the library spaces they use. This result further confirms what Ladhari and Morales (2008) found that there is a positive and significant correlation between perceived service value and library as a place of studying and learning standing at 0.567, where the p value was less than 0.01.

Libraries need to be quiet places to enable the users to concentrate while reading or studying. This study sought to know from respondents whether they found Ugandan university libraries as quiet places for individual study. According to the graduate students who desire a library to be a space for reflective study and research, 48.5% rated it good and very good, while those who felt that it was poor and very poor were 19.9%. Notably in Catawba colleges, this variable scored 0.47 meaning both Ugandan university and Catawba college libraries meet the minimum expectations of their users as far as university libraries being quiet places for

individual studies is concerned. Therefore, SMEs who might be in need of a quiet place to reflect on innovative business solutions can find it in university libraries.

Despite the fact that university libraries need to be quiet places for users to concentrate while reading or studying, they also need designated places for loud communication and group study. This study therefore sought to know from respondents whether university libraries had adequate spaces for group study and learning. This was a point of concern because, the merged views of those who rated it good and very good was 33.2%, far smaller compared to the merged views of those who felt that these spaces were poor and very poor (41.4%). Incidentally at the Canadian libraries, Ladhari and Morales (2008) found a positive and significant correlation between perceived library as a place and library as a place for community and group study and learning of 0.519, where the p value was less than 0.01. This therefore calls for Ugandan university libraries to put in more effort in this area if they are to satisfactorily serve SMEs. This will require Ugandan university libraries to re-engineer their library spaces to be able to organise SME seminars, "short business courses, recitals in their premises and the need to provide the community with an adequate service environment" in form of parking, rooms for business meetings and building cohesion (Ladhari & Morales 2008:363).

For library patrons to keep coming back to the library, they must find it comfortable and inviting. The researcher therefore sought to establish whether the graduate students found the library comfortable and inviting. Most of the respondents (129, 35.1%) rated the comfort in university libraries as good, 118 (32.2%) found it fair, 54 (14.7%) rated it very good, 52 (14.2%) rated it poor and 14 (3.8%) rated it very poor. At Catawba colleges, the adequacy mean stood at -0.07 (Harer 2006). Both the Ugandan university libraries and the Catawba colleges scored below the minimum expectation of their users in this regard. Therefore, there is still a lot of work to be done to make Ugandan university libraries comfortable and inviting.

The gist of this study focused on research and innovation information services in Ugandan university libraries. The graduate students who felt that the research and innovation library services were good and very good were 52.6%, while the academic staff were 42.8%. A similar study was carried out on Canadian libraries by Ladhari and Morales (2008) and found a positive and significant correlation between perceived library as a place and library as a conducive place for research and learning of 0.528, where the p value was less than 0.01. The

university libraries in Uganda should therefore think deeply on how to support research and learning taking place on virtual platforms and "spaces outside the context of the university libraries" (Gastinger 2006:4).

6.3.3 University libraries' Dissemination of R&I Information

As far as dissemination of R&I information is concerned, the highest number of respondents (65.6%) believed that the university library would effectively disseminate this information to SMEs through the universities' institutional repositories (IRs). Indeed, this approach balances the cost of the SMEs accessing R&I information and the cost the library incurs in providing the R&I information service. IRs can effectively help university libraries "maximise the available R&I resources optimally" since they allow multiple and remote access (Markgraf 2007:165). It would save the SMEs the cost of coming to the university libraries physically and universities employing extra staff to attend to SMEs.

Furthermore, dissemination of R&I information through IRs can cultivate social innovation. Haugh, Lyon and Doherty (2018) stated that social innovation refer to novel solutions discovered socially, more efficient, effective and sustainable compared to individual innovation. By university libraries disseminating R&I information to SMEs through IRs, social enterprises are blended, skills and resources are shared, platforms of engaging and communicating with new stakeholders are created; since such innovations breed social entrepreneurship, such innovations are rarely challenged (Haugh et al. 2018). There is however, explicit need for proper records management because Holland and Denning (2011:139) argue that repository managers have to make "clear choices about the direction and content" of their R&I information management. In other words, repository managers in Ugandan university libraries need clear, complete and accurate records of the research output if it is to be seamlessly harvested by SMEs and lead to social innovation.

The traditional marketing mix of 4 Ps (Product, Price, Place of distribution and Promotion) has now evolved into the "4 Cs (Customer value, Cost, Convenience of customer and Communication)" (Markgraf 2007:164). University libraries should never assume that their value of R&I information is self-evident. If SMEs can see the direct value of R&I information in their business success, then there will be more likely to patronise it. This thinking is in agreement with Wilson's 1999 model which states that an information seeker normally returns to an information source that satisfies his/her information need. Therefore, "communication is the promotion in the 4 Ps", but goes beyond to include feedback

(Markgraf 2007:166). This communication is effective when librarians first establish what their SME patrons exactly need, what puts them off and how the whole service can be improved. Through creating these strong linkages between the library management and SME patrons, this will enable the library to establish genuine and credible relationships which will eventually build a sense of belonging where the patrons themselves market the library to their fellow peers even without the library first imploring them to do so.

University libraries have a serious competitor in the name of the internet, therefore they are expected to make the process of providing quality R&I information to SMEs as convenient as possible. University libraries should integrate marketing in a way corporate businesses "approach strategy and service development" (Gastinger 2006:4). This can be done through a number of ways like providing user guides, conducting periodical trainings and user assistance. Saulus, Mutula and Dlamini (2018) further recommend that university libraries need to conduct needs assessment and usability testing to understand better the needs of SMEs to provide R&I information services that is tailored to their business needs. Awareness and advocacy campaigns on how to effectively use institutional repositories may also be needed specifically targeting SME patrons (Ammarukleart 2017).

6.3.4 Agricultural Research in Uganda and Beyond

Successful enterprises no longer innovate in isolation. Most SMEs are increasingly taking on cooperative or networked innovation (Freel 2018). In this study, about half of the SMEs (117, 51%) belonged to professional bodies in order to access R&I information from external sources where individual firms come together to collectively innovate. Actually, Jones et al. (2018:304) argue that networks are the foundation of entrepreneurship marketing which can trigger "swift growth and expansion of new ventures".

The third largest number of respondents (14%) belonged to the Private Sector Foundation (PSF). PSF is a venture capital or financial intermediary which attracts financing from a number of investors then engages the SMEs to focus in a certain line of investment. PSF essentially helps these member SMEs to identify promising investment opportunities, provide R&I information in form of business advice and even investment capital grants or loans that are payable with a modest interest rate. The important part of venture capital firms like PSF, is that they invest at all stages of an SME's development right from start-ups to those which are already up and running (Mason 2018).

According to McAdam and Soetanto (2018) SMEs not only gain R&I information from networks but also get opportunities of getting incubation support for their innovative ideas such that small firms can also pursue sustainability and growth like large firms. This incubation support is provided by networks in a number of ways like offering professional advice, mentorship and general enterprise development. There is strong evidence that networks could prove effective in support of small and medium enterprises, therefore making the most from competition and cooperation with larger firms (Ayadi et al. 2017).

Wilson's 1999 model provides for information exchange where university libraries and the SME networks can exchange R&I information all for SMEs to benefit more. Widharto (2002:85) reports of scenarios in Indonesia where the agricultural curriculum in universities tend to be heavy on theory and deficient on practice. Many universities in Uganda too have gone ahead to offer masters and doctoral degrees before achieving institutional maturity, lacking in serious research experience and therefore weakening the agricultural research output. They therefore need to partner with networks like PSF to at least devise means of enriching the agricultural research output of agricultural SMEs.

Majority (185, 80.1%) respondents expressed negative comments on the operations of National Agricultural Advisory Services (NAADS) compared to the 46 (19.9%) who had positive ones. Odoi (2018:583) concurs with the respondents that NAADS is bogged down with many shortcomings like targeting few individuals, benefiting only wealthier farmers, and that "there is no difference between farmer's agricultural performance of those under NAADS and those who are not". Surprisingly even in advanced countries like China, SMEs' "linkages and cooperation with government research agencies do not demonstrate any significant impact on the innovation performance" (Zeng et al. 2010:181). Similarly, in Tunisia, innovation seems not only negative to government agencies but even to Foreign Direct Investments (FDI). Moreover, there is little inter-connection between public research and the private sector (Ayadi et al. 2017). Therefore, in the face of the foregoing, SMEs in Uganda are advised to seek more R&I information support and cooperation with other partners, such as research institutions, universities, and intermediary private institutions.

6.4 Re-engineering University Libraries R&I Information Services

El Elj (2012) explored the impact of innovation determinants amongst Tunisian SMEs and found out that research done in universities significantly contribute to the level of national innovation, research and development. It was further established that low technologically

intense firms are more motivated to innovate though the managers of those firms are hampered by the limited R&I information resources (Ayadi et al. 2017). This is not only unique to Tunisia, but also happens in Uganda. In this section, the researcher interprets, explains and discusses the study findings on how universities can re-engineer their library R&I information services to serve SMEs with R&I information better. This discussion is done reflecting on the theories of modern management that state that an organisation has to adapt to the changes in the environment.

6.4.1 Re-engineering University Library Spaces for SMEs

For university libraries to encourage thinking and learning for SMEs, they have to redesign their spaces to be flexible, supportive, "future oriented, enterprising and bold" (Waller 2011:70). This thinking conforms to the social techno approach of the theories of modern management that looks at transforming the technology of an organisation into a meaningful tool in the hands of the users (Lawrence & Lorsch 1967a). According to McDonald (2010:33) Library space is "very expensive and precious" as spacious and well planned university library buildings greatly underpin the development of other library resources. In other words, poor library space can constrain the development of R&I information service to SMEs.

In this study, slightly more than a third (37.2% and 38.4%) of the academic staff and graduate student respondents respectively believed that university libraries in their current state had an enabling environment for SMEs to come and easily access R&I information for their entrepreneurial programmes. In order to also get a view from the expected consumers of R&I information from the library, the researcher also asked the SME respondents for their opinions on the same. Slightly more than a half (126, 55%) of the SME respondents believed that university libraries in their current state had an enabling environment for SMEs to access R&I information for their entrepreneurial programmes. This however does not mean that Ugandan universities should relax in this area because according to Gastinger (2006), libraries need to seriously rethink their physical spaces as two fifth of their respondents felt the university libraries did not have the enabling environment for SMEs to easily access R&I information.

The researcher probed deeper into this phenomenon and asked the respondents to name some services and areas in the library that need to be re-engineered, if these libraries are to serve the SMEs better. According to the academic staff and graduate students, the leading area the university libraries need to re-engineer, if they are to serve SMEs better was digitisation.

Digitisation of the R&I library information was chosen by 21% of the academic staff and 20.5% of the graduate students respectively. This is the current trend of libraries of the 21st century as Gastinger (2006) supports this idea that for Ugandan university libraries to remain relevant, they have to open up their print collections to digital channels and reveal them to the world through digitisation.

The second leading area that needs re-engineering was social media. SME respondents (117, 20.6%) felt that university libraries need to re-engineer the way they use social media. Re-engineering Social media involves strategically utilising several social media channels to maximise the impact of the R&I information services on SMEs. The university library should come up with a strategic plan of having their presence on the leading social media sites like Facebook, YouTube, Instagram, Twitter, Snapchat and Pinterest. There should be dedicated library staff who promptly respond to library users' queries (Tuten & Solomon 2017).

Web 2.0 has evolved in university libraries as a key tool for outreach for users in "promotion, communication, marketing, and general service delivery" to an extent that any library ignores it at its own peril (Godwin 2011:15). According to Bolorizadeh and Smith (2010:121), university libraries can use web 2.0 tools to provide access to SMEs to "create content, interact with fellow patrons, participate in knowledge communities, collaborate" and share R&I information within the different virtual spaces.

6.4.2 Re-engineering University Library Technologies for SMEs

The respondents wished the R&I information to be repackaged using technology and converted into short documentaries, newsletters, and that university libraries should repackage it in formats compatible with social media. Using social media can also help university libraries to strengthen their customer relationship management (CRM). The libraries will be able to use social media to attract new SME patrons and also maintain contact with the old ones as social media helps in maintaining and updating their databases containing pertinent information from which the library customises follow-up messages and offers that are likely to meet the SME's R&I information needs (Tuten & Solomon 2017).

One female university IT interviewee raised the issue of university libraries employing technology to effectively disseminate R&I information for SMEs, since many people in the community now have smart phones. More mobile devises are becoming ubiquitous. University libraries have to ensure that the platforms they use to disseminate R&I

information are compatible with these mobile devices (Crowley & Spencer 2011:227). Research has shown that their biggest drawback was the inaccessibility to third party resources (Chen et al. 2010:269). University libraries in China have taken advantage of the wide spread of mobile devices to ease access to library resources outside official library opening hours. Through this, "the dissemination of information on library upcoming events has saved on the library inadequate sitting space among others" (Chen et al. 2010:269). Jaggers (2007:24) advises that university librarians need to keep abreast with new technology, but also realise that some of it easily fades, while some continues to be utilised.

Another set of respondents (90, 10.5%) suggested that the library digitises it and eases its online access. Kakai (2018) also points out that digitisation of R&I information is a strategic response to the opportunities university libraries have of working in a networked environment. Unlike the print formats which can be accessed by coming physically to the library. Moreover, the digitised content can be accessed by multiple users and from anywhere any time. Digitisation further solves the problems of the traditional scholarly journal system which include wear and tear of the journals, missing pages, missing issues, theft and mutilation among others.

Today, digitising has also led to text and data mining (TDM). TDM is a knowledge-generation tool used in modern libraries to automatically search literature for new scientific discoveries (Pal 2011). Therefore, university libraries digitise their R&I information, it greatly helps SME patrons to easily compare different research results with published literature, identify convergence of scientific evidence to obtain new innovations and knowledge discovery. TDM further saves the time of the SME patrons as vast amounts of R&I information can be categorised, annotated and relevant results highlighted according to users' needs and business profile (Agabirwe 2018).

Most striking was the fact that 93 (10.8%) of the respondents were of the view that R&I information should be repackaged and telecasted on television, while 87 (10.1%) respondents suggested that the library should partner with radio such that the R&I information is repackaged and broadcasted on radios. In recent studies in Tanzania and Malawi, it was also reported that the most common platforms used by farmers for sharing agricultural information were mobile phones, radio and television respectively (Kapondera, Chawinga, Majawa & Mphunda. 2018; Benard, Dulle & Lamtene. 2018). The high preference of radios

is mainly because they are affordable, portable, flexible, they use local languages, which are comprehensible and they disseminate timely information (Benard et al. 2018).

The respondents also proposed that the print R&I information should be repackaged into audio and video formats as revealed by 104 (13.3%) of them. Similarly, Gastinger (2006) advocated for university libraries to start providing stewardship in transforming physical collections into non-traditional types like e-science data, audio, and video among others.

6.4.3 Re-engineering University Library Staff for SMEs

Library leadership is all about taking responsibility, directing, facilitating, steering, guiding, motivating and inspiring library staff members. In order to successfully re-engineer library staff to serve SMEs with R&I information, Arora (2002:10-14) suggests some personal traits that can help library leaders pursue and implement this vision which include: "having a positive attitude, leading by example, love and having passion for the task, having readiness to accept mistakes, having a well-defined vision, allowing flexibility, being sincere, letting the actions speak for themselves, recognising and grabbing opportunities as they come, ability to write and win project funding, commanding respect instead of demanding for it, motivating and nurturing your followers".

In this survey, 57 (73.1%) respondents stated that librarians need unique skills if they are to serve SMEs with R&I information better. Gastinger (2006:4) argues that librarians need unique skills in order to "exploit advances in technology and informatics". One male university IT officer was concerned that librarians were not in touch with the modern and trending library technologies. Due to rapid development in technology, university library staff need to be fully compliant with the digital technologies, they should have the ability to use a wide spectrum of web tools that help in analysing, cleaning and visualising R&I information for researchers and SME patrons (Smith & Veldsman 2018). The emerging skills recommended to train students in Library and Information Science (LIS) schools include: introduction to the Git version control system and the GitHub collaboration tool, Web scraping, using of Python programming language, scientific writing, reuse of research information in support of funder compliance, establishing and managing scholarly identity with ORCiD contributorship, and copyright ownership, identification of reputable open access publications, scholarly annotation and open peer review among others (Smith & Veldsman 2018).

Extant literature advocates for university library staff to take up these cutting-edge technologies to remain relevant as many activities that traditionally have been part of their routines are increasingly being performed by computers. One of the new skills needed in these technologies is the ability to conduct systematic evaluations of the R&I information system of the university, particularly in relation to 'allocation of research funds, new possibilities and expectations' of Ugandan universities (Namuleme 2018).

Today librarians' roles are changing from just being information providers to fundraisers. According to Friend (2010:159), even when a university "library is well funded, external funds are needed" to support special collections or projects like the one of serving SMEs with R&I information. How much more is this aspect needed when libraries are underfunded? Therefore, fundraising is now becoming mandatory in modern librarianship. For Ugandan universities to take on this challenge of serving SMEs, they will need librarians with skills in fundraising.

The respondents were probed to suggest the unique skills library staff working in these R&I units need in order to serve the SMEs better. The leading unique skill according to the 46 (59%) respondents was communication, 20 (25.6%) of the respondents stated repackaging skills and lastly 12 (15.4%) stated proven leadership skills. Similarly, Ford and Schnuer (2018:8) stated that "Librarians must develop cross-cultural communication skills which include the ability to listen, learn, exchange ideas and understand local needs in a global context". Good communication skills are very key in today's globalised economy because they can enable a librarian to successfully disseminate R&I information in both global and local perspectives.

6.4.4 Re-engineering University Library Partnerships

Emerging trend for research funders require that "funded research be disseminated under the open access arrangement" (Swan 2011:123). Opening access to R&I information for SMEs requires a lot of collaboration and teamwork. Librarians should be good at "collaborating with partners, working together as teams" in order to devise creative ways of optimally utilising this opportunity of serving SMEs with R&I information and also innovating novel approaches on how to make it functional and successful among the SMEs (Crowley & Spencer 2011:230). Below is the interpretation and discussion of the respondents' views on how best university library partnerships can be re-engineered.

6.4.4.1 The Mission and Visions of University Libraries

All of the university libraries involved surveyed made it clear that their primary mission is to support teaching, learning and research, therefore, making the university students, academic and non-academic staff members the priority. However, the mandate of university libraries extends slightly beyond the university campus. In this regard, University libraries are expected to serve not only the academic staff and students, but researchers and other external users as well. Musoke (2008:532) posits that most university libraries extend their services to users outside the university community as many of these "libraries also serve as national referrals in certain subject areas as well as legal deposit libraries". Consequently, they should design their university missions and visions to incorporate also R&I information services for SMEs. Such provisions can be of great help in that, instead of waiting for those outside users to come for the specific information, the university libraries can instead identify where those users are and take the information to them through the university outreach programmes.

From the findings in this study, it was clear that a number of universities have visions and missions of engaging the community and some of them have attempted to carry out community outreach programmes. Most of these outreach programmes were mainly to schools possibly because being academic institutions, schools seemed to be a perfect landing ground. As stated earlier, most of these schools were private schools and therefore were considered SMEs. Thus, university libraries must extend their services to SMEs in other sectors, most especially those in the "agricultural sector which has the largest number of SMEs in Uganda" (Uganda Bureau of Statistics 2011:39).

6.4.4.2 University Library Collaborations with Professional Library Bodies

In line with information exchange dimension under Wilson's 1999 model, the study investigated how university libraries could exchange their R&I information through collaborating with professional library and non-library bodies. University libraries are challenged daily on the types of collaborations and alliances they need to engage with in order to present coherent "collections and create innovative new R&I information products and services for effective content delivery" (Gastinger 2006:4). From the findings of the study, there was the general perception by respondents that as far as serving SMEs with R&I information is concerned, the professional library associations have nothing or little to offer.

Leading library associations in Uganda especially CUUL and ULIA have not been satisfactorily cultivating the spirit of partnership and collaboration among university libraries

and SMEs. There is therefore need for a concerted effort in this area in order for them to offer what is expected by their members. Library associations in most developing countries are facing challenges such as ineffective leadership, inadequate policies, lack of collaboration, low membership, inadequate finance, inadequate communication, and limited infrastructure (Kawooya 2001; Khan & Bhatt 2014). Ossai-Ugbah (2013) further outlines similar challenges of professional library association in Africa that include difficulties in the use of technology such as email, internet access, and video conference. In order for universities to bridge this gap between them and the communities, these library associations should actively devise ways of ensuring equitable access to ICTs and the benefits which accrue from them so that SMEs begin to notice their contribution to the development of the profession, library institutions and among business enterprises.

6.4.4.3 University Library Professional Collaboration with Community Leaders

Many SME respondents were excited by the idea of university libraries breaking the intellectual walls and coming down to the local communities to interact with them in a community outreach partnership. Arant and Mosley (2000:1) defined university library outreach as "an act of the library extending its services and benefits to a wider section of the population" and involving communicating a particular message to an audience to gain their support. This approach is discussed in detail under section 6.4.5.

6.4.4.4 University Library Professional Collaboration with Public and Community Libraries

Though not quite a popular view, university libraries are formulating partnerships with public and community libraries in feasible and viable ideas. Dent (2007:215) reports of a similar arrangement at the Kitengesa community library which organised women's groups and began adult literacy classes "taught by the librarian and a visiting scholar from the University of British Columbia". Through this partnership between Kitengesa community library and the University of British Colombia, local experts in raising pigs, goats, cattle, and chickens were brought on board. The women further learnt more on bookkeeping and enhancing income generation. This example from Kitengesa, a community library in a rural village in Masaka district in Uganda, suggests that even local Ugandan university libraries can form promising partnerships and connections with rural libraries through which they disseminate R&I information to SMEs and positively impact on small-scale economic development in those areas.

6.4.4.5 University Library Professional Collaboration with Research Centres

The issue of university libraries partnering with local laboratories, young and upcoming scientists in the community is not new or an abstract idea. It is already happening in South Africa where partnerships are made with local labs, where new research level materials with initial device manufacturing and tests are provided (Manyala 2017). Through such partnerships, detailed feedback on the materials development process has paved the way for meaningful interaction with industrial partners. Most importantly, this partnership can be used to facilitate the interplay between national and international laboratories, where the university library enables them to share R&I information and reduce wastage of time reinventing the wheel. Notably, there are laboratories at universities where the focus is on training of young researchers and postgraduate students. Through the university library, the R&I information generated through such engagements can be shared with the SME researchers and other interested SME patrons. Lubuma (2017) highlights the importance of the universities partnering with industries and how this not only helps in advancing scientific research but also benefiting both academic and commercial interests.

The University of Pretoria has established strong relationships with industry partners and individuals where they jointly own innovation hubs which are significantly contributing to the bio-economy of South Africa. This strategy needs to be replicated in Uganda, possibly championed by university libraries. However, restraint must be exercised because Neal (2010:14) cautions that orchestrating radical library partnerships require only bi- and tri-lateral collaborations because multi-lateral approaches more often are normally too shallow and therefore not feasible.

6.4.5 Re-engineering University Library Outreach Services

According to the findings of the study related to how Ugandan university libraries could re-engineer their community outreach, 237 (22.1%) of respondents raised the issue of conducting special training for library staff to serve SMEs; 201 (18.8%) stated university libraries embracing open access; and 199 (18.6%) suggested conducting R&I entrepreneurship workshops for SMEs. This concept is called entrepreneurial learning where entrepreneurs adapt to changes and learn as they work or navigate through their business activities (Pittaway, Huxtable-Thomas & Hannon 2018). Entrepreneurial learning has two dimensions; the first is on where the university library conducts a R&I training for SMEs to

reflect on the past; and the later consider alternative courses of future action which may lead to SMEs retaining good business practices and avoiding bad ones (Taylor & Thorpe 2004). The second dimension is sometimes emotional as it emphasises learning from business failures and crises. The university library can organise these R&I seminars where they have sessions where the business men and women critically learn and think through business mistakes and disasters which later can be a pathway to transformative learning (Pittaway et al. 2018).

However, some scholars argue that SMEs might find difficulties attending such training programmes organised by the university library because of a number of reasons such as considering the opportunity cost of attending the course against generating more revenue at their workstation; despising the act of learning from fellow entrepreneurs; failure to see immediate benefits from the training programs; attending training programmes from people like librarians whom they do not consider to have extensive experience in business; and surrendering their business control and independence to others, among others (Clarke et al. 2006; Jones et al. 2014; Fuller-Love 2006).

On top of training SMEs to access R&I information, University Libraries should bring R&I information out of the library to SMEs in their own environments. Alternatively, Ugandan university libraries can create an ambience that is welcoming and user-friendly to SMEs. This calls for developing proactive services for the SME patrons that would make them aware of the existence of such R&I information and consequently build mutually beneficial relationships between the university librarians and the SME patrons.

Elsewhere, university outreach programmes are also known as community engagement and there are diverse but with no funding involved. University libraries simply utilise the few available resources to aid the communities around them. In South Africa, university libraries give ICT donations, books, free training sessions, equipment like chairs, tables among others (Bangani et al. 2016). This does not only apply to public university libraries but also private university libraries. In Kenya, a private Kabarak University Library responded to the information needs of the children in the community and created a children's section in the university library. This made the library popular in the community and used it as a strategy for "creating a good relationship between the university and the community" (Kinyanjui 2010:99). In the same vein, both public and private university libraries in Uganda have available R&I information that needs the libraries to go out and train SMEs on how to access

and utilise it for their entrepreneurial growth and consequently contribute sustainable community development.

Kampala City Council Authority (KCCA) through its directorate of gender offers Kuroiler Chicken to urban farmers to boost their house hold incomes (Kalumba 2014). Kuroilers are a type of hybrid birds, a crossbreed of coloured broiler males and Rhode island red female chicken (Roy's Farm 2018). Farmers benefiting from this project are praising KCCA saying that the Kuroilers hardly fall sick like other breeds, they grow fast and feed on anything. In Nakawa Division, KCCA in conjunction with NAADS distribute one day old chicks and poultry boosts among small scale poultry farmers; through this communities are empowered and transformed (Wamakuyu 2014). Based on the efforts of KCCA and NAADS to transform urban farming, they automatically become potential partners which Ugandan university libraries should consider working with.

Makerere University in partnership with Aqua Fish Innovation visits different fish farms in the district of Mukono and Buikwe, sharing with them advanced scientific research in fish farming in order to build their capacity in business development. "They hope to train them in feed technologies using natural and cheap inputs" (Jagwe 2016:11). This is another example of community outreach but the library is missing in this linkage. The Makerere University, Faculty of Agriculture and Aquatic life should work with the library to complement such initiatives.

6.5 Access and Utilisation of R&I Information by SMEs

As research and learning increasingly take place in the virtual environment, university libraries are advised to keep their users closer if they are to remain relevant to them (Gastinger 2006). In this section, the researcher interprets and discusses the findings of the skills and competencies needed by SMEs to gainfully access and utilise R&I information in Ugandan university libraries. This discussion is underpinned by the Wilson's (1999) information seeking model focusing more on the dimensions of information use and satisfaction of information use.

6.5.1 Skills and Competencies Needed by SMEs to Access R&I Information

From the data collected on the usage of university libraries by SME respondents, it was noted that 70.1% of the SME respondents had never used a university library in the recent past despite the fact that most of these respondents were graduates. University libraries need to

seriously ask themselves questions like "How can university libraries be relevant to those who had never set foot in the library?"(Gastinger 2006:4). The 57 (24.7%) respondents consented that they had used a university library in the recent past.

Since over 80% of SME respondents declared that they needed R&I information to effectively run their agricultural businesses, the researcher asked them to state the different kinds of R&I information they need while conducting their business. They were quite a number of information needs, but the leading need was increasing their sales and marketing with 11.6% of the SME respondents. This is expected because "market/ consumer awareness and market readiness are often the leading causes of firm failures at the start (Jones et al. 2018:301). Indeed Lechner and Pervaiz (2018:151) argue that young and small firms need R&I information to strengthen their entrepreneurial strategies to "venture into new markets, survive and grow in them". Small firms lack information on market competition, but since they are customer oriented, they make effort to establish close relationships with customers through rushing to respond to customers' demands. This is difficult and unsustainable, therefore getting R&I information on marketing trends and customer preferences from formal sources like university libraries would be much easier and sustainable.

In addition, 123 (10.4%) respondents needed information on enhancing business growth which has two different connotations, where one may refer to increase in the amount of output or sales and other times it may imply improvement in the quality, size, process of the products of the enterprise (Adomako & Mole 2018). According to the results from this study, university libraries need to package R&I information in such a way that it enhances business growth in these two dimensions.

Moreover, 36 (3%) respondents stated that they need R&I information to help them start up or venture into new businesses. Lechner and Pervaiz (2018:156) advise that there is need for more research in this area as "little is known on how entrepreneurs deal with uncertainty and act upon opportunities." There is still little research in this area as many scholars ignore it since it is generally regarded less viable, theoretically fuzzy, less elegant and riskier. The current study therefore provides a platform for research that would address the SMEs that seek this kind of R&I information.

The researcher sought to know the sources with which these SMEs get R&I information. The results showed that 123 (14.1%) respondents accessed their R&I information from newspapers, followed by 114 (13.4%) who visit websites to access R&I information for their

businesses, and the third source was mobile phones 102 (11.7%). This may partly explain why people sometimes think that internet would render libraries worthless. Gastinger (2006) advises that Ugandan university libraries need to chat new ways to add value and remain relevant by building capacity of providing R&I information through the library website and mobile phones. This has to be addressed urgently because the libraries and R&D units were the least sources used with each standing at 9 (1%) respondents.

6.5.2 Skills and Competencies Needed by SMEs to Use R&I Information

The researcher sought to find out whether the SMEs had the required skills and competencies needed to access R&I information in university libraries. A female university librarian noted that they serve a number of external users such as researchers, staff members from non-governmental organisations, central and local governments, but rarely serve patrons from the business sector. This is unexpected from the business sector because as Steve Wozniak, the co-founder of Apple said, "entrepreneurs have to keep adjusting to the situation"; even SMEs have to acquire the necessary skills and competencies needed to keep adjusting to the dynamics of research and innovation and consider utilising university libraries to access the R&I information that can boost their businesses (Vahidnia et al. 2018:53).

However, there were a dismal 25% of SME respondents who stated that they used their information literacy (IL) skills and visited university libraries to access R&I information and they normally searched for specific R&I information using their database searching skills; 15 (26.8%) respondents were searching for information on effective business management and meeting customer satisfaction. This revelation is consistent with what Kinyanjui, Kabare and Waititu (2018) found in a similar study on SMEs in Kenya. They posited that SMEs used IL skills and sought for R&I information to keep their firms ahead of their competitors, gain competitive advantage, higher financial performance and better customer satisfaction.

This study further revealed that 13(23.2%) respondents were using information evaluation competencies when searching for information on improving dairy production, while 10 (17.8%) used analytical skills when searching information on preventing animal diseases. This is confirmed by Smith and Veldsman (2018) who noted that the Open Data Institute (ODI) report was provided to the Uganda government research data on the spread of the banana bacterial wilt disease with real-time information. This intervention enabled them to quickly identify the most affected areas and direct treatments for the disease, thus preventing further advances. This R&I information which was provided by the ODI, must have been

consumed by SMEs proprietors with reflective and responsive information competencies in commercial banana farming among others. Therefore, if more SMEs possessed these information literacy skills and competently patronised the R&I information services in university libraries, the impact would be insurmountable.

From the findings of this study, it was evident that the few SMEs that possessed the IL skills and accessed and utilised R&I information from university libraries experienced a positive impact on their agricultural businesses. Most of these respondents (20, 48.8%) used the R&I information to expand their businesses and also boost productivity; these were followed by 9 (22%) of the respondents who used this information to increase their sales and profits, then 5 (12.2%) just wished to be more knowledgeable. The least group in this study (1, 2.4%) gained more knowledge on the side effects of agro chemicals. Odoi (2018:588) noted that utilisation of R&I information through sharing farmer to farmer information helps them to gain "confidence, become creative, innovative, and competitive". Utilisation of R&I information enhances the SMEs' potential for survival. However, the dissemination of this R&I information is still done disjointedly. There is need for all stakeholders and active actors, international bodies NARO, NAADS, District agricultural authorities and university libraries to collaborate as they address these unique R&I agricultural information needs.

6.5.3 Information Literacy Programmes for SMEs

The respondents who had indicated that they had never visited or used a university library in the recent past were asked for reasons why they did not, and the findings indicated that more than half (57.1%) of the respondents were not aware of the R&I information services in university libraries. SMEs and other business proprietors not being aware of research and innovation information collections is ironic considering that 54% of them were graduates and 17% had postgraduate qualifications. However, there is a proposal of establishing open data initiatives to help governments, SME businesses and civil society organisations to utilise available R&I digital data for sustainable development (Gurin 2015). It is envisaged that such initiatives will increase the awareness of R&I information in universities. University libraries should therefore take advantage of this initiative and collaborate with it so that their R&I data is also made publicly available and put into more usable formats by SMEs for "job creation, economic growth, and more effective governance and citizen engagement" (Smith & Veldsman 2018:254).

There was another category of 30 (20.4%) respondents who stated that the research information in university libraries was complicated to understand; 27 (18.4%) of them wished to come but the university libraries were very far away from them; lastly, 6 (4.1%) found the R&I information in university libraries was irrelevant to their kind of business. Basahuwa (2017) notes that the changing information environment, intensified competition, technological advances, changing customer needs, and generally the changing SME business environment are the leading causes of people finding libraries to be far away with complicated and irrelevant information. The university libraries need to redefine their role, innovatively create responsive and convenient information services using a wide range of applications like social media tools and dynamic websites in order to make the R&I information services more visible, understandable and easily accessible from any electronic platform (Islam, Agarwal & Ikeda 2015; Chewe & Chitumbo 2018).

These respondents were further probed whether they would be interested in the university library conducting for them information literacy programmes so that they get oriented on where and how to use the university library to access R&I information for their businesses and the following were their views. Contrary to popular belief, the results showed that 189 (81.8%) of respondents were comfortable with the idea of university libraries conducting for them information literacy programmes, 27(11.7%) respondents did not like it and 12 (5.2%) respondents did not know about it. As already pointed out, information literacy was conducted for the health workers by university libraries (Musoke 2012); in the same way, it can also be done for the SME business patrons. However, it has been argued that for this to work, librarians need to desist from their laid-back and passive attitude of university staff (Kiconco 2018). Indifference and lack of active participation may greatly hinder information literacy initiatives and public relations/community outreach programmes organised by university libraries.

6.5.4 Utilisation of R&I Information

A business culture can be used by the management of an enterprise to promote and nurture a shared pattern of thinking, for example corporate entrepreneurship (Amo & Kolvereid 2018). To give the study a picture of how SMEs utilise the R&I information, SMEs were asked to give examples of how they utilise the R&I information they access from the library as well as other sources. The findings revealed that 47 (24.2%) respondents use R&I information for analysing business situations and making appropriate decisions, this suggest that these SMEs

have cultivated the culture of corporate entrepreneurship. This can create a pro-entrepreneurship culture that will encourage SME employees to share and think through the R&I information, experimenting, "testing ideas in an information rich environment", committing efforts to business initiatives and even taking personal risks without feeling that their positions are threatened (Amo & Kolvereid 2018:267). Managers of SMEs should therefore actively seek for R&I information to ensure corporate entrepreneurship is empowered and innovative employees are rewarded with incentives.

The results further revealed that 31 (16%) respondents use R&I information for applying modern technology. This is true because Arinaitwe (2014) reports of how urban commercial farmers in Kampala were applying modern technologies to grow pasture for cattle, goats, pigs and chicken without soil. This technology was promoted by Kyanja Agricultural Research centre where they grow pasture from anywhere using seeds and water and the pasture is ready for consumption within six days.

The least reasons of using R&I information was enforcing business strategic goals, and also conducting demonstrations for customers, which scored a frequency of 1 (0.6%). Notably, SMEs use R&I information to meet their strategic business goals. This may not stop at business level, it can even go further up to the national and international level. The use of R&I information can greatly help SMEs start-up multi-stakeholder partnerships that might contribute to the implementation of international agreements like pollution, climate change, food security, and environmental protection among others. Access and use of this R&I information further facilitates SMEs to adaptation and also complement these international partnerships and agreements (Pauw & Chan 2018). This result is in conformity with the contingency approach of the modern theories of management that relates to making adjustments in an institution that takes into account the prevailing legal, political and economic environment in which the SMEs survive.

Leitch and Harrison (2018:31) argue that small firms are generally more sensitive to "external contexts especially environmental dynamism and volatility". There is need for entrepreneurs of these enterprises to gain more insight from the custodians of R&I information on how to navigate through this dynamism and volatility, such that it impacts their small firms positively leading to more viability and growth.

The researcher further inquired whether there were SMEs that had utilised R&I information which helped them to come up with their own unique and local innovations. The results revealed that 171 (74%) SMEs of respondents had utilised R&I information which enabled them to come up with their own unique innovation. This is one of the advantages small and medium enterprises have over large enterprises. Like the Seed Company that was able to use R&I information to come up with an innovative marketing strategy, many small firms have an advantage in marketing, management and internal communication using R&I information compared to large companies. This advantage is bound by their "nearness to the customers, lack of bureaucracy and their flexibility" (Freel 2018:283).

Utilisation of R&I information in an SME should inform development of new and innovative products and services; however, it is discouraging to note that 45 (19.5%) of the respondents in this study had never developed any innovation out of the R&I information they were accessing and utilising. The R&I information utilisation should be reflected in "entrepreneurial dimensions of innovations, risk-taking and pro-activeness" (Jones et al. 2018:301).

6.5.4.1 Impact of Adopting Local Innovations

The leading impact of adopting innovations on the businesses of the respondents of this study was according to 81(19.6%) of the respondents' improved business growth as a result of adopting these innovations. Adoption of innovation triggers a variety of entrepreneurial advancements as many of its manifestations are innovative start-ups, higher productivity and improved business growth (Stam & Spigel 2018).

Another 63 (15.2%) of the respondents experienced better customer satisfaction. These statistics agree with Llave (2017:201) who states that there are multiple benefits accruing from adopting innovations resulting from business intelligence such as "faster and easier access to information, savings in IT infrastructure cost, and greater customer satisfaction". Adoption of innovations further creates brand loyalty, since customers continually get satisfied with the improvement of the quality of the products (Schwaiger, Lang, Johannsen & Leist 2017).

The least impact was one of inventing new technology which was mentioned by 18 (4.3%) respondents. One of the reasons for this finding is that small firms budget for less or little financing for technology adoption (Freel 2018). SMEs tend to look for external funding for

technology adoption; consequently, the least impact of R&I information was on technology invention and adoption.

This study also sought to know how sustainable these innovations were after being adopted by SMEs. Most of the respondents (37, 88.1%) found the innovations simple and easy, while 3 (7.1%) rated them fair. This statistic is encouraging because when SMEs find it easy to produce and process their goods innovatively, there is reduction in the cost of production and improved profit margins. This encourages more investment in research and innovation which translates into engaging in more experiments that may result in new products and services for the enterprise (Kinyanjui, Kabare & Waititu 2018).

6.5.4.2 Difficulties of Adopting Local Innovations

Amo and Kolvereid (2018:271) assert that gone are days when scholars shunned research on failed innovations claiming that "it is not an innovation until it has succeeded. In this study, 2 (4.8%) of the respondents found it difficult and expensive to sustain their innovations. Unlike large firms, small firms face a number of challenges particularly regarding "attracting finance, recruiting specialists, managing growth and dealing with regulation (Freel 2018:283). Failed innovations and applying innovations with difficulties evoke mental dispositions and later trigger industrial revolutions; SMEs have a lot to learn from them.

The researcher wished to know whether the SME respondents faced barriers while applying or adopting these innovations. The results showed that largely, the SMEs found it easy to sustain the innovations, however, the SMEs did experience difficulties in applying and adopting innovations. According to the findings, 147 (63.6%) of the respondents experienced difficulties, while 33 (14.3%) did not experience any difficulties. In this study, the leading difficulty SMEs faced while sustaining innovations was the high financial implications which was mentioned by 23 (28.9%) respondents. This could be attributed to the fact that large firms "control more resources and are often more capable of pulling off more radical innovations" compared to small firms (Amo & Kolvereid 2018:267). In a related study, 50% of Tunisian large firms engaged more in innovation compared to small firms mainly because large firms have more resources to expend on innovations compared to small firms (Ayadi et al. 2017). Besides, small firms happen to be more resource constrained and this ultimately curtails their contribution to innovation (Freel 2018).

A section of 21.4% of the respondents complained of the rigidity of clients when they instructed them to adopt their new agricultural innovations. According to Ngwira and Majawa (2018) ease of adopting new innovations depends on the age. In their study, they noted that younger farmers were more responsive to new ideas and practices compared to older ones who seemed to be more conservative. Therefore, university libraries need to be cautious when they face the same rigidity with SMEs failing to adopt new innovations found in the R&I information university libraries disseminate.

6.5.4.3 SMEs Access to Flexible Agricultural Loans

Mason (2018) asserts that the biggest challenge to entrepreneurs is not raising money but having the wits and hustle to do business without it. A number of respondents raised the issue of financial implication as one of the leading challenges of sustaining innovations. The researcher sought to know the level of awareness of SMEs about banks and other financial institutions which offer flexible agro-based loans and leases to farmers and agro-based enterprises. Extant literature shows the role banks are playing in stimulating innovation as "funders of innovation" among SMEs (Freel 2018:285). In this study, slightly more than half of the respondents (51.9 %) were not aware of the flexible agro loans and leases available to them. In addition, most entrepreneurs preferred bootstrapping when raising funds for their enterprises. They mainly did this through self-financing, raising funds through social networks, reducing risks and costs. A number of entrepreneurs preferred this approach because it is inexpensive, flexible, and has no financial obligations. It creates a natural culture of financial discipline and does not involve any issues of relinquishing ownership of the enterprise (Mason 2018).

The SME respondents who were aware of the flexible agricultural loans were 108 (46.8%). However, access to financing remained the leading barriers to doing business in Uganda (Lakuma & Sserunjogi 2017). According to the survey by the Economic Policy Research Centre based at Makerere University, the intensity of access to finance in Uganda increased from 6.2% to 9.1%. Despite the reduction of the Central Bank Lending Rate (CBLR) by 1.5 percentage point, the cost of credit hardly reduced in most banks. The poor performance in accessing and using credit is further reflected in the Credit Reference Bureau facility where there are high number of cases of non-performing loans for all sizes of businesses (Lakuma & Sserunjogi 2017). Besides the increase in the intensity to access financing, 19(29.7%) of the

respondents revealed they found the loan application process too complicated, bureaucratic and unfavourable for the farming businesses.

The results showed that the biggest percentage of the respondents who were aware of these flexible agro-based loans 64 (59.2%) had never taken the trouble to apply for them, only 39 (36.1%) had applied for them. SMEs needed both tangible and intangible resources while setting up viable business ventures and acquiring necessary equipment for the business. There are three main sources of financial capital and these are "traditional debt financing, venture capital financing and informal investments" (Eller & Gielnik 2018:174). Most of the SMEs in this study get their financial capital from informal investment like bootstrapping, self-financing, family, friends and other related social capital sources. Even in the United States, a very little percentage of SMEs venture into traditional debt financing for start-ups (Freel 2018; Mason 2018).

The results revealed nearly all entrepreneurs use bootstrapping in their early stages of enterprises. Instructively 21.9% of the respondents claimed that their enterprises were financially stable and did not need loans. Bootstrapping should help an enterprise raise value for its shares so that the enterprise can be worthy to apply for equity finance at some point in the future. With SMEs using the bootstrapping approach (self-financing and raising funds through social networks), this has the potential to limit injecting more resources in the enterprise and ultimately constrain the ability for the enterprise to "pursue innovative growth opportunities' (Mason 2018:325).

Another 10 (15.6%) respondents stated that they were afraid of the high interest rate. High interest rates charged to SMEs is not only a problem in Uganda but also, in Zimbabwe and other developing countries. In general, SMEs are perceived as "high risk clients by financial institutions and hence charged higher interest rates to access finance" (Murigu 2017:16; Raifi 2017). The government has a big role to play to mitigate this problem by intervening as a "good will broker" and set policies that differentiate the interest rate charged to small firms compared to large firms (Freel 2018:287). Ugandan SMEs continue to grapple with very high interest rates averaging 21% which makes access to credit relatively hard (Oketch 2018).

The 1.6% of the respondents felt that the loans were not applicable to small enterprises despite the finding that there are flexible loans suitable for agro-based enterprises for SMEs. Mason (2018:321) explains this anomaly saying that even though the providers of equity finance try to create an impression that they offer flexible agro-based loans to SMEs, these

loans are primarily for 'business angels' and not for small firms that are starting up. These equity finance providers want to see a proven business model and evidence of market traction before they can release the loan; so many SMEs are considered risky to invest in credit.

6.6 Factors and Perceptions that Influence Innovation in SMEs

This section discusses the respondents' findings of the factors and perceptions that influence innovations after SMEs have accessed and utilised R&I information from Ugandan university libraries and other sources. This discussion is underpinned by the Wilson's (1999) information seeking model focusing more on the dimensions of information use, satisfaction and dissatisfaction of information use.

6.6.1 Influence of Innovation in Ugandan Agricultural SME

According to Llave (2017:195), business enterprises began using R&I information to influence business intelligence and analytics in the late 2000s. Business intelligence and analytics was used as a "unified term to describe information-intensive concepts and methods for improving business decision making". The leading mechanism that influenced business decision making among the SMEs in this study was the demands from their customers. It was revealed by 44 (19.7%) of the respondents that their decisions are influenced by the demands from their customers. Moreover, 39 (17.2%) of the respondents stated that the market dynamics determine the business decision they make, while 27 (11.9%) stated that their decisions are determined by the profit the business is or will be making. Information on markets' dynamics and market prices from which they make profits and a living is needed by SMEs to survive (Kapondera et al. 2018). This mainly applies to SMEs in the rural areas that make less profits when they sell their agricultural produce locally after collecting it from farmers and incurring storage costs. This information is therefore important to urban markets where they can move this produce and sell it to make more profits (Abdulhamed 2016).

The least influence according to results were governmental bodies as mentioned by 1 (0.4%) respondent. This is contrary to what Raifi (2017) found in Kosovo, that a government can greatly influence innovation through setting up an innovation centre. Such information infrastructure is founded on a state of the art information system which provides SME "managers, employees and consultants with courses, training and consultancy services at subsidised rates" (Raifi 2017:31). The governments in Sub-Saharan Africa must therefore rise to the occasion as influencers of innovations in SMEs.

In response to the question on whether they use R&I information to inform or support their business decision making, 7 (22.6%) of the respondents indicated that they engaged experts and other professionals to verify the R&I information accessed before making a key business decision. According to Haugh et al (2018), involvement of different stakeholders in consultation and decision making is a social enterprising strategy which is more resource intensive but ensures endogenous growth of the enterprise. The university libraries must therefore be ready to work with such experts and professionals, since they can act as a bridge between the SMEs and the university libraries.

A small number of 5 (16.1%) respondents used R&I to support their decisions on training and supervision. Senelwa (2018) reports how commercial farmers in Uganda were to benefit from a combined $26 million training aimed at enhancing coffee production for export. This training would be conducted by a German based Benckiser Stftung Zukunft and Enveritas of New York; this intervention is hoped to improve food security and small agricultural businesses which is a viable support to income and economic growth. There is need for collaboration between universities and developmental partners when conducting such trainings so that both parties complement each other in relaying R&I information to SMEs. The systems approach of the modern theories of management, underscores to the element of decision analysis, as a linking process and a factor that influences the use of R&I information.

6.6.2 Adequacy of R&I Information for SMEs

The respondents were asked to mention the indicators showing adequate R&I information they would like to access and utilise in their business. The highest number of the SME respondents (129, 21.6%) indicated that the R&I information they access should be accurate. This is in accordance with ethical principles of information which dictate librarians all over the world should provide the highest level of service to all library users by offering appropriate and usefully organised resources which are accurate, unbiased and in an equitable way (Malemia et al. 2018).

Almost a fifth of the SME respondents (18.6%) wished that information is disseminated in a timely manner. Ngwira and Majawa (2018) in this regard, were of the view that commercial farmers need to have access to timely and quality R&I information at an affordable cost for their productivity potential to be realised. Furthermore, 102 (17.2%) of the respondents wished that R&I information should come in a format that is sharable on different

communication platforms. The culture of open access is still new to many researchers in Uganda and many are sceptical about it. That notwithstanding, Kakai (2018) in a PhD study found that over 91% of her respondents from Makerere and Kenyatta University agreed that their research works need to be openly accessed and shared on different scholarly platforms.

Another 6 (1%) of the respondents were of the view that access to research work must conform to existing policy and regulatory framework. This view is consistent with the open science movement. Open Science is all about publicly funded research, its diversity and how it meets the needs and interest of the people. Chisenga (2018) argues that for open science to flourish, it should have support from the highest political and government levels. For R&I information to get support from government, it should be consistent with the existing policy and regulatory framework most especially those that provide for increased public access to research and open access initiatives.

6.7 Challenges Faced in the Provision of R&I Information to SMEs

Challenges faced by SMEs in accessing R&I information can be broadly categorised into five: political, funding, infrastructural, institutional, cultural and personal attributes (Kanyengo & Mugalo 2008:192). Below is the interpretation and discussion of challenges raised by the respondents.

6.7.1. Political Challenges

A total number of 239 respondents raised political challenges about policy and inability of government to play its role in this campaign of university libraries serving SMEs with R&I information. The Ugandan and even other African national governments are battling with problems like lack of basic IT support systems, infrastructure, power shortages and weak telecommunication systems. All this is mainly because of failure to demonstrate a strong political will to put in place an “IT-driven work culture and society” (Omekwu 2006:262). A quick example is the Open Access policy which most African countries and universities have not yet adopted and implemented. By March 2018, out of over 500 African universities, only 32 in 12 African countries had implemented open access policies and thesis mandates (Agabirwe 2018; EIFL 2018). If governments had the political will, the open access policy would have translated into an appropriate IT policy or legislation that would ease the management and dissemination of R&I information in universities.

6.7.2 Institutional

The second highest number of respondents (293) raised challenges that were mainly institutional in nature, revolving around poor library equipment, procedures and processes. Another 245 respondents raised challenges relating to library systems. Omekwu (2006:262) questioned how African university libraries discharge their information support services roles for "learning, research, development and recreation without strong IT foundation and internet connectivity". Institutional imperatives like connecting to the global network, offering the clientele system unlimited platforms for information and cultural exchange in a multimedia context, retrieving R&I information in a matter of seconds are still a challenge in many Sub-Sahara African university libraries. University libraries without internet access and a link to the superhighway are losing out in the new information order.

There were also 278 respondents who stated that university libraries have poor methods of disseminating R&I information. A study on open distance learning libraries in India, raised the need of scaling up the library information dissemination system to serve the scattered distance learners (Tripathi & Jeevan 2009). SMEs are also geographically dispersed around the country and each have their own varied information needs which may not be easy for Ugandan university libraries to adequately satisfy.

The issue of poor library staffing in Ugandan universities cannot be ignored as 148 (21.9%) respondents raised it. The availability of "talented, well qualified, literate, technical" university library staff adept in SMEs user friendly library serving techniques is required (Tripathi & Jeevan 2009:56). Many university libraries have thin staff structures mainly because of the need to regulate the wage bill, and other staff are on study leave pursuing higher qualifications. Universities generally rely on a heavily bureaucratic system where peers need to first agree in order to maximise a change and this normally limits re-engineering of structures to provide a new service (St. Clair & Linke 2004:204). According to Kwanya (2016:64) information seekers are no longer satisfied with the current library experience and desire that it should stretch beyond "books, crowded noisy reading areas, limited parking, bureaucratic limitations on the use of resources, unfriendly and unavailable library staff". University libraries therefore need to respond to these concerns before seekers of R&I information relinquish libraries as the main points of business information.

6.7.3 Funding

The highest number of respondents (363) raised the challenge of poor funding. Chisenga (2018) noted that in the western world, governments fund scientific research and innovation, while in Africa, there is almost nothing budgeted for research and development. Apart from a few countries like South Africa and Namibia which deliberately budget for research and development, the rest of Africa is lagging behind in this regard. This therefore means the little R&I information that is generated and disseminated in Africa largely depends on external funding. Popham (2010:236) warns that reliance on external or project based funding makes it very difficult to "retain skilled staff with expertise" in managing R&I information. It further impedes career development of less skilled staff and leads to institutions losing a lot of this knowledge when these projects or grants come to an end.

6.7.4 Infrastructural Challenges

Quite a number of respondents (206) raised challenges that were infrastructural in nature. The "lack of computers, low bandwidth and other technological problems" can greatly hamper SMEs from accessing and using R&I information from university libraries (Tripathi & Jeevan 2009:56). This is even more of a challenge in the remote and rural areas where SMEs may use cyber cafes. Without sufficient infrastructure, university libraries will remain ineffective in communicating agricultural research to the productive private sector" and have little impact on the economy (Widharto 2002:86).

6.7.5 Personal and Cultural Challenges

From the personal and cultural perspective, 238 respondents raised the challenge of poor reading culture mainly in SMEs and abuse of copyright and intellectual rights in the process of repackaging R&I information into other usable formats. Gherman (2005:32) reports that "some local tribes in Uganda do not have a written language" and many of their literally works have never been recorded, and therefore they have never had a chance of being shared to the western world via the web. In contrast, some major tribes have tried to record their knowledge but there is a lot of copyright abuse as there is little concern about the massive pirating and duplication of these works for distribution. Uganda has over 52 ethnic groups, and converting R&I information for all these languages is a daunting task for university libraries. The other challenge relates to pirating, counterfeiting and copyright abuse that might come along with it.

6.8 Proposals to Address Challenges

There is need for strong and visionary leadership to steer the "multi-functional and multi skilled professional teams" to reposition in order for the university libraries to embrace R&I information. The strong leadership should be able to negotiate new partnerships and collaboration in order to help SMEs leverage the great value of R&I information collected and stored in university libraries (McKnight 2011:10). Below are the discussions of the suggestions by respondents on how university libraries can address the challenges faced in disseminating R&I information to SMEs.

6.8.1. Political Interventions

Politically, 89 respondents of this study suggested a number of proposals that government need to implement, including but not limited to creating adaptable policies, guarding against counterfeit, agricultural products flooding the market, and regulating content on TV to achieve 70% local agro R&I information and 30% foreign. In virtually all the developed countries, there has been a rising discussion on policy and SMEs. Consequently, this has led to the design of SME or entrepreneurship policies (Hoffmann & Storey 2018). Denmark has already designed such a policy. Uganda and other Sub-Sahara African countries should emulate Denmark and design a R&I policy with scholars and researchers from the university largely contributing to it.

SMEs should be regulated in the way they access R&I information for use in their business endeavours (Kitching 2018:401). Simplifying regulation eases government procedures and facilitates the growth of SMEs and enhances economic contribution to the business sector (Almobaireek, Alshumaimeri & Manolova 2018). Easing of government procedures enables successful businessmen and philanthropists to use their networks to improve the entrepreneurial environments for SMEs. In such regulation, government only retains the leading role of "creating a conducive economic and social environment" by designing enabling laws and policies, and sourcing for training in order to reduce R&I information asymmetry (Stam & Spigel 2018:412). The starting point for government of Uganda, is to articulate an R&I information and informatics policy. Such policy should provide for the development of a R&I "core national computer and IT manpower in order to cut down on the high cost of IT expatriate staff (Omekwu 2006:262).

Another example of a government intervention through policy is when the government of Uganda through the Uganda Coffee Development Authority (UCDA) decided to distribute

208 million coffee seedlings in the five growing regions of the country in 2018. This is aimed at increasing coffee production and exports by 20% compared to last year (Mukhwana 2018). All this is evidence that opportunities to lift the plight of SMEs in Uganda to compete on both national and international markets, lie in policy reforms (Khan 2017).

6.8.2 Institutional

Institutionally, 77 respondents raised suggestions relating to how university libraries should bring SMEs together to share R&I information and experiences, conduct workshops, engage with related stakeholders, and partner with MAAIF, UCC, UN, FAO and WHO to promote more agricultural programming on the media. The University of KwaZulu-Natal periodically organises workshops of a similar nature. Recently, it organised the third annual Ukulunga Howard Davis Memorial Symposium to show case research carried out by the scientific community at the university (Cuénod 2018). A number of topical issues were presented and discussed such as agripreneurship, technological post-harvest innovation and sustainable agricultural value chains among others. Over 200 delegates attended from academia, small scale commercial farming, agricultural industry, agribusiness sector, NGOs, farming community and students. This kind of event bridges the gap between the researchers who generate the R&I information and the consumers. In addition, such symposia and workshop enhance multidisciplinary information sharing among participants from all related sectors.

In Uganda, the strategy of using symposia or workshops for SMEs to share R&I information can be championed by the Consortium of Ugandan University Libraries (CUUL). Professional associations all over the world are playing an important role in supporting university libraries to adopt emerging technologies. Similarly, CUUL can assist in designing strategies that ensure that Ugandan libraries "leave up to this global expectation" (McKnight 2011:11).

One of the biggest challenges of university libraries in the twenty first century is to "find new ways of adding value and remaining relevant in this rapidly changing and competitive environment" (Gastinger 2006:4). The new theories of management state, that university libraries should not allow to be relegated to the side walk, but devise means to remain relevant. One sure way is to see how they can contribute to the entrepreneurial growth and sustenance of SMEs which "account for about 90 percent of businesses and more than 50 percent of employment worldwide" (Llave 2017:195). Entrepreneurial activities are outcomes

of an entrepreneurial ecosystem made up of people who "create opportunities for innovation" (Stam & Spigel 2018:408).

University libraries should organise trainings that engage entrepreneurs in more reflective learning and invite experienced business experts as some entrepreneurs wish to learn from more experienced and successful entrepreneurs. The libraries should also embed some aspects of situated, emotional and affective learning (Pittaway et al. 2018). Conducting IL trainings for SMEs would go a long way in having qualified and competent library staff members. University libraries should develop their staff in such a way that they acquire the "right mix of skills' that can enable them train SMEs to better access R&I information (Gastinger 2006:5).

University libraries can use the "Listening, Analysing, Relating and Acting" (LARA) framework to guide them when using social media to meet the R&I information needs of the SME patrons (Tuten & Solomon 2017:26). University libraries can use social media to listen to the customer conversations which may include preferences complaints, and frustrations among others. After listening, the library managers can go ahead and analyse the content of those conversations to help design R&I information strategies to meet the needs of SMEs (Tuten & Solomon 2017).

6.8.3 Funding

The highest number of suggestions from respondents related to funding as revealed by 121 respondents. They suggested that avenues should be created that consider increasing funding for agricultural R&I information, initiating public private partnerships, to fund this model of university libraries supporting SMEs with research and innovation information. In addition, university libraries should write grant proposals to seek funding to support this business idea. Moreover, consideration should be given to reduction in the taxation on equipment used to manage and disseminate R&I information. With many university libraries facing severe financial crises (Gastinger 2006), they should restrict investment in people and increase investments in infrastructure in order to optimise their output (Follet (2010:59).

The suggestion of reduction of taxes on agricultural innovations is hotly debated in Uganda. There is a view that large agricultural firms make huge profits but want to evade paying taxes. In Uganda agro-processed goods are exempted from paying income tax, while unprocessed agricultural products and livestock are exempted from paying Value Added Tax (VAT) (World Bank Group 2018). However, cattle breeders, many of whom are well

established farmers are exempt from paying tax, thus denying government large tax base. Therefore alternative and equitable measures should be designed that create income thresholds and ensure small farmers below the threshold are exempted from certain tax requirements, but large farmers that are above the threshold and produce "significant values of cash crops and livestock comply with VAT and corporate income tax (World Bank Group 2018:30).

6.8.4 Infrastructural Changes

The second highest number of suggestions was around infrastructural changes as raised by 107 respondents. They suggested that university libraries should design improved R&I dissemination systems, digitalise R&I Information, restructure R&I dissemination methods, ensure stable internet such that the R&I information can easily be uploaded or downloaded and also used on social media by SMEs that happen to be largely external users. Ugandan university libraries are advised to "invest more in innovations and digital activities" (Gastinger 2006:5) because libraries need a formidable IT infrastructure in order to advance digital technology. These libraries should further come up with the modern journal and research publications and the entire management of the R&I information on the web.

6.8.5 Ugandan University Library Research and Innovation Information Management Model

Research and Innovation (R&I) information is increasingly becoming central to how global companies conduct their business affairs. The movement of this information across different institutions and platforms underpins the globalisation of the internet and information communication technologies (ICTs). Ugandan SMEs need to deeply use R&I information to reach their consumers and develop new business competitive models sustainably (Samans & Meléndez-Ortiz 2015:344). Ugandan universities too, must take advantage of the smartest R&I information resources and most prized researchers who are their academic staff and graduate students and work with SMEs where the university libraries are working as the intermediary. It is only then that Ugandan SMEs shall gain dominance in the dynamic globalised trade which is largely driven by research and innovation.

A vibrant university library system that is able to pick business problems that hamper SMEs from competing sustainably on the global market must be on the fore front of R&I and cutting-edge solutions. Such library systems should treat the business problems as research problems and feed them to the researchers to get solutions. Thereafter, the research findings

and solutions have to be tested to ensure that they can work in the market place. The library system should also package these solutions in the form of R&I information and disseminate it back to the SMEs for application. The successful application of R&I creates new products and services for the market, therefore causing the SMEs to become more versatile in the national and ultimately the global market. The applications which do not work should be sent back for more investigation; this therefore becomes a cycle which runs as it supports the growth and development of business and trade.

This system should further be in position to receive input from researchers who seek out new international markets, identify existing products or product development opportunities. Thereafter the system should offer timely solutions for SMEs to spearhead the development effort. The Figure 45 illustrates how this strategy can work for both the Ugandan university libraries and SMEs.

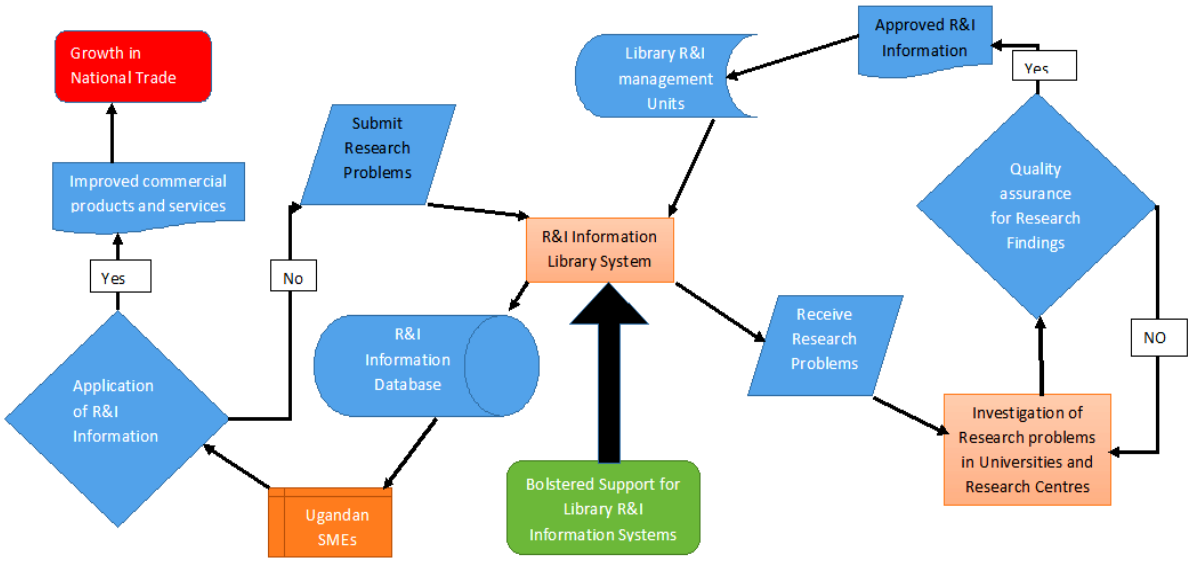


Figure 44: Bolstering support for University Library R&I Information framework

This framework starts with government and other concerned parties deliberately deciding to streamline and strengthen the R&I system and processes in university libraries. The system picks the problems from the SMEs and sends them to the researchers. There should be a quality assurance unit which assesses the viability and feasibility of the solutions generated from the research units at the universities. If satisfactory, the solutions are documented and sent to the library, if not, they are sent back for more thorough redress. On receiving the solutions, the libraries process these solutions which by now is R&I information and feeds it back into the system for dissemination. The system repackages this R&I information in

formats that are easily accessible by the SMEs and disseminates it through a database which should be high-tech with virtual capabilities. According to Arzberger et al. (2004) access to and sharing of publicly funded R&I information must be advanced within an international framework, beyond technological solutions. It is from there that the SMEs pick R&I information that relates to their line of business and apply it for the betterment of their business. Since it's already tested, it should work to give these companies an edge in trade but in case it is still wanting, it can be sent back for more improvement and the cycle continues.

The Ugandan economy must not only rely on her big corporations to remain competitive in global trade; she should additionally nurture other local entrepreneurs to tap into the overseas market. This move can also be facilitated by this framework where they can invite foreign researchers and innovators to collaborate with domestic technopreneurs to pursue cutting-edge research. The international cooperation enhances this approach, since it allows gathering information and insights based on company case studies and the experience of other nations with companies engaging in global trade (Samans & Meléndez-Ortiz 2015:485). A combination of this will in the long term launch new industries that could make Ugandan SMEs dominate the Sub-Saharan regional trading environment.

Hall and Nahdy (1999) found that the fundamental nature of the relationship between science researchers and the small entrepreneurs in Uganda is largely missing. The R&I information system would help streamline the research process to only conduct research on business problems that have been presented with clear objectives, scope and justification. Involving university libraries in this equation to provide R&I information can make Ugandan SMEs to provide global goods and services that are compliant with the global trends. This further shall provide the necessary synergies to engage in regional and international trade.

In 2003, the Japanese National University Corporation Law went into effect and provides for national universities to take on a corporate status and develop their distinct research functions and all library staff members consequently became non-governmental officials. This is a global trend which introduces the idea of private and profit oriented management in universities. However, the Ugandan government should not entirely be part of this system to ensure control. Furthermore, there are long term research investments that private universities who look at short term profits may find hard to venture into. In such a case, it is only government or public universities than can intervene.

Many university libraries in Japan support lifelong learning, since they are open until late in the evening and on holidays. The flexible opening hours are suitable for patrons interested in R&I information like business men and women, graduate students and other external researchers (Japan Library Association 2016). There are impressive statistics on the general operations of university libraries in Japan. Similarly, in South Africa, the University of KwaZulu-Natal (2018) library is open 24 hours but only during the semester. However, it was not clear how the UKZN library has eased access and use of R&I information for the betterment of the SMEs. Nevertheless, Ugandan university libraries need to seriously think about revising the library opening and closing hours if they are to incorporate SME patrons.

Besides engaging university libraries' R&I systems to serve SMEs, the university libraries should additionally provide spaces where proprietors of SMEs can interface with teams of advisors and experts in global trade. These experts should be in a position to offer entrepreneurial tips based on empirical evidence from the R&I information. This would encourage anyone with a feasible idea or innovation of improving their business or even starting up a SME to come for any form of professional consultation.

6.9 Summary

The chapter started by presenting the demographics of the respondents. The results revealed that the 68% of the respondents were male of which 78.9% were aged between 20-40 years, and most of the SME respondents were graduates. This was a clear indicator that there is need for more women empowerment in this area of scientific agricultural studies and business. The fact that 78.9% of the respondents are young and literate, further makes agricultural SMEs a potential target market for university libraries R&I information. The results further revealed that 87% of the SME respondents had R&I information needs, yet 70% of them had never used a university library in the recent past; it was high time Ugandan university libraries chat new ways to add value and remain relevant in this environment of the Google generation.

Although more than a third (37.2% and 38.4%) of the academic staff and graduate student respondents respectively believed that university libraries in their current state had an enabling environment for SMEs to easily access R&I information for their entrepreneurial programmes, they also believed that there is need to seriously rethink how university libraries can improve their physical and virtual environments for SMEs to be attracted. Such improvements may include digitisation of the available R&I information, use of social

media platforms to disseminate R&I information, repackaging this information into short documentaries and newsletters, training staff members with the required skills of serving SMEs with R&I information, engaging in partnerships and collaborations with entities that generate and promote the dissemination of R&I information and finally strengthen the university library outreach programmes.

It was noted from the discussion of the findings that 70.1% of the SME respondents had never used a university library in the recent past. They sought their R&I information from newspapers (14.1%), websites (13.4%) and mobile phones (11.7%). Ugandan university libraries need to chat new ways to add value and remain relevant by building capacity of providing this R&I information through the library website and mobile phones. There were a dismal 25% of SME respondents who stated that they used their IL skills in university libraries to access R&I information and they normally used these IL skills and competencies such as; database searching, reflective, analytical, critical inquiry and responsive information skills when searching for specific R&I information in university libraries.

More than half (57.1%) of the SME respondents were not aware of the R&I information services in university libraries. Nonetheless, 81.8% of the SME respondents were enthusiastic about the idea of university libraries conducting for them information literacy programmes. For this to be feasible, it would take the active participation of the library staff in the university library outreach programme. The leading challenges in designing R&I information by university libraries for use by SMEs were shortage of finances, institutional inadequacies and lack of infrastructure. The study proposed a university library research and innovation information management framework that can act as a model for addressing these challenges.

CHAPTER SEVEN

SUMMARY, CONCLUSION AND RECOMMENDATIONS

"It always seems impossible until it is done"
Nelson Mandela

7.1 Introduction

This chapter presents a synthesised synopsis of the overall research study (Dawson 2009). It systematically summarises the findings, draws a conclusion to the study and raises recommendations of how Ugandan university libraries can serve SMEs better with R&I information. The researcher attempted to reconcile the research findings with those of other scholars, appraise the research work by taking note of the strengths and weaknesses of the study and made suggestions for future research (Thomas 2011). This chapter therefore provides a reaffirmation of the research objectives, justifying the methodologies and theories used to under pin the study and succinctly provide answers to the five research questions investigated in this study.

This chapter is made up of eight sections. Section 7.1 introduces and describes what this chapter entails, section 7.2 restates the research purpose and research questions of the study. Section 7.3 explains the summary of the findings based on the research questions. Section 7.4 is the conclusion of the study which summarises the research findings. The recommendations of the study are presented in section 7.5. Section 7.6 provides and explains the originality of the study. Section 7.7 describes the limitations of the study and section 7.8 makes suggestions for further research.

7.2 Research Purpose and Research Questions

The purpose of this study was to investigate how university libraries in Uganda can repackage R&I information and disseminate it to SMEs. The study addressed five research questions namely:

1. What R&I information sources and services are provided by university libraries to SMEs in the agricultural sector in Uganda?
2. How can R&I information sources and services be re-engineered and disseminated better to SMEs by university libraries**?**

3. What skills and competencies are needed by SMEs to effectively access and use R&I sources and information services?
4. What factors and perceptions influence access and utilisation of R&I information sources and services by SMEs?
5. What challenges are faced by university libraries in providing R&I information sources and services to SMEs?

7.3 Summary of the Research Findings of the Study

This section provides a summary of the findings to the five research questions outlined above.

7.3.1 R&I Information Sources and Services Provided by Ugandan University Libraries

The leading sources of R&I information in Ugandan universities were graduate students and academic staff. Both categories of researchers stated that their research contributes to increasing the productivity and identifying investment opportunities for SMEs. Identification of investment opportunities is one of the key factors of entrepreneurial orientation and gives SMEs a competitive advantage (Lechner & Pervaiz 2018). The findings further revealed that Ugandan university library staff treat their patrons fairly well; however, they need to improve on their library spaces and systems most especially the designing of the library websites. The results revealed that of over 50 universities in Uganda, only one university library has a fully functional Institutional Repository (IRs) meeting international standards (Kuteesa 2016; OPENDOAR 2018). In particular, 65.6% of the respondents believed that Ugandan university libraries would effectively disseminate R&I information to SMEs through the universities' IRs. They believed this approach would balance the cost of the SMEs, accessing R&I information and providing the R&I information service (Markgraf 2007). This would also save SMEs the cost of coming to the university libraries physically on one hand, and the universities, the cost of employing extra staff to serve SME patrons.

7.2.2 Re-engineering of University Library R&I Information Services for SMEs

The respondents strongly supported the idea of Ugandan university libraries re-engineering their R&I services if they are to appeal to SMEs. The findings showed that the three leading ways the R&I information can be repackaged using technology are converting R&I information into short documentaries, newsletters, formats compatible with social media and translating it into local languages. Use of social media is very popular today and can go a

long way to attract new SME patrons, as well as help in following up or maintaining contacts of the old patrons (Tuten & Solomon 2017). The university libraries must therefore ensure that the platforms they use to disseminate R&I information are compatible with the smartphones and other mobile devices (Crowley & Spencer 2011:227).

Moreover, 90 (10.5%) of the respondents suggested that the library digitises R&I information to ease its online access. Kakai (2018) points out that digitisation of R&I information is a strategic response to the opportunities university libraries have of working in a networked environment. Today, digitising does not only ease multiple and remote access to R&I information, but it has also led to text and data mining (TDM). TDM is a knowledge-generation tool used in modern libraries to automatically search literature for new scientific discoveries (Pal 2011). When university libraries digitise their R&I information, it greatly helps SME patrons to easily compare different research results with published literature, identify convergence of scientific evidence to obtain new innovations and knowledge discovery (Agabirwe 2018).

Most striking was the fact that 93 (10.8%) of the respondents were of the view that R&I information should be repackaged and telecasted on television, while 87 (10.1%) suggested that the library should partner with radios such that the R&I information is repackaged and broadcasted on radios. The most common platforms used for sharing agricultural information were mobile phones, radio and television (Kapondera et al. 2018; Benard et al. 2018).

7.3.3 Skills and Competencies Needed by SMEs to Access and Use R&I Information Services

The results revealed that 87% of the SME respondents admitted that they have R&I information needs though 70.1% of them had never used a university library in the recent past to seek information more, even though 71% of the respondents were graduates and above. The results revealed that the three leading sources of R&I information for the SMEs were newspapers (14.1%), websites (13.4%) and mobile phones (11.7%).

The results also showed that 57.1% of the respondents were not aware of the R&I information services in university libraries; 20.4% stated that the research information in university libraries was complicated to understand; 27 (18.4%) wished to visit the university library save for the long distance they had to cover. However, there were 25% of SME respondents who stated that they possessed information literacy skills and competencies needed to access R&I in university libraries. They further stated that they used skills and

competencies such as database searching, reflective, analytical, critical inquiry and responsive information skills to access and use R&I information in University libraries and their businesses benefited from it.

There is therefore need for university libraries to redefine themselves and innovatively create responsive and convenient information services using a wide range of applications such as social media tools and dynamic websites in order to make the R&I information services more visible, understandable and easily accessible (Islam et al. 2015; Chewe & Chitumbo 2018). Makerere University Library has in the past conducted information literacy programmes for health workers (Musoke 2012); therefore, it can do the same for the SME patrons.

7.3.4 Factors and Perceptions that Influence Utilisation of R&I Information Services by SMEs

The leading factors that influence utilisation of R&I information among the SMEs were: meeting customer demands (19.7%), market dynamics (17.2%), and the profit margin (11.9%). The ability for an SME to innovate in order to increase its sales and revenue is a speculative process and it requires the commitment of SME to make sound business decisions on how it accesses and utilises R&I information. The issue of government influencing utilisation of R&I information was least mentioned (0.4%). Raifi (2017) argues that a government can greatly influence innovation through setting up innovation centres. Such information infrastructure is founded on a state of the art information system which provides SME "managers, employees and consultants with courses, training and consultancy services at subsidised rates" (Raifi 2017:31). The governments in Sub-Saharan Africa must rise up to the occasion and be recognised as influencers of innovations in SMEs.

7.3.5 Challenges Faced by University Libraries in Providing R&I information Services to SMEs

The challenges that might face university libraries serving SMEs with R&I information were mainly financial as indicated by 363 respondents. Moreover, another 293 respondents cited institutional problems. Chisenga (2018) noted that governments fund scientific research and innovation in the western world, while in Africa, there is almost nothing budgeted for research and innovation for development. This state of affairs means that most of the on-going research in Africa largely depends on external funding, which creates difficulties in retaining skilled researchers (Popham 2010).

The institutional challenges raised included poor library systems, equipment, procedures and processes. Omekwu (2006:262) questioned how African university libraries are discharging their information support services roles for "learning, research, development and recreation without strong IT foundation and internet connectivity". Institutional imperatives such as connecting to the global network, offering the clientele system unlimited platforms for information, cultural exchange in a multimedia context, and retrieving R&I information in a matter of seconds are still challenges to be resolved in many Sub-Saharan African University libraries.

7.4 Conclusion

The findings of the study have revealed that Ugandan university libraries predominantly serve students and academic staff. They however allow external users which may include SME patrons to use the library. They have R&I collections that meet SME information needs and their staff treat their patrons fairly well. However, university libraries do not have the ideal enabling environment for SMEs to patronise their R&I information. There is therefore need to re-engineer the library spaces and systems most especially the design of easy to use, inviting library websites, and initiate community engagement programmes for SMEs. They should also establish functional institutional repositories which would ease the dissemination of R&I information to SMEs.

The results of the study also indicated that most SMEs have R&I information needs which are met through accessing newspapers, websites and mobile phones instead of university libraries. The best way Ugandan universities can attract SMEs to patronise their R&I information collections, could be through repackaging R&I information into formats that are usable by SMEs. These formats may include converting R&I information into short documentaries, newsletters, local languages and into formats compatible with social media, radio and television. They should therefore ensure that the R&I information is digitised and the platforms used to disseminate R&I information are compatible with smartphones and other mobile devices.

7.6 Recommendations of the Study

Below are the recommendations proffered in this study.

Currently most of the content broadcasted on radio and television is mainly for entertainment and recreation purposes. Government should consider designing a policy regulating this

content as it does not have much impact on the social economic transformation of the country. It should be replaced with up to 70% content on R&I information which can be consumed by SMEs. The same policy should also empower university libraries and other R&I information managers to supply this information to the broadcasting stations. This is because radio and television are the leading sources of R&I information for SMEs.

University libraries should consider bringing SMEs together to share R&I information and experiences through regular workshops and symposiums. Such events would bridge the gap between the researchers who generate the R&I information and the SMEs who are the consumers. This should be championed by the Consortium of Ugandan University Libraries (CUUL). For the start CUUL can jointly coordinate interdisciplinary workshops where all Ugandan university libraries participate then later CUUL can support individual universities to conduct these workshops on their own depending on the discipline and the category of SMEs.

It is recommended that Ugandan universities should consider initiating public private partnerships, so that private business entities can fund this framework of university libraries supporting SMEs with research and innovation. Such partnerships should be initiated with capital firms which have an affinity for influencing innovation. Furthermore, University libraries should write funding proposals and apply for grants from developmental partners to support this innovative business research idea.

Since a number of university libraries are underfunded, they should restrict investment in people and increase investments in infrastructure to optimise their research output and ultimately impact on the communities around them.

Respondents suggested that there is need for a reduction of taxation on equipment and accessories used to generate, manage and disseminate R&I information among others. Such reduction of taxes on agricultural innovations should be differentiated between SMEs and large-scale enterprises. This is because large scale enterprises generate huge profits and should be required to pay taxes, while SMEs should be exempted.

The government of Uganda and the university libraries should consider using solar energy, inverters, and stand-by power plants to supply electricity especially in rural areas that are not

connected to the national grid. This alternative energy should also act as a backup to the main electricity supply system to avoid power cuts in the system which leads to university libraries not being able to fulfil their R&I information delivery services.

The government of Uganda should consider adopting the R&I information system. This system should invite input from researchers as custodians of new innovations and research generated in the universities. Those who access and use R&I information should be able to identify product development opportunities for their enterprises. Thereafter, the system should offer timely solutions for SMEs to spearhead the development of business and trade both at a national and international level.

7.7 Originality and Contributions of the Study

When research is conducted "thoughtfully, ethically and systematically", it contributes to the world of knowledge (Rossman & Rallis 2017:293). Such research works can be used to solve societal problems, help in decision making, programme re-designation, contribute to building theories, legitimise new understandings, transform concepts and influence behavioural changes (Neuman 2011). This adduces the originality of the study and its contribution to the world of knowledge.

The findings of the study provide a better understanding on the factors that influence the adoption and use of R&I information systems in university libraries. The study revealed that governments, stakeholders and managers of university libraries need to develop policies that would guide them in the collection and dissemination of R&I information for SMEs.

Theoretically, the study provides additional insight into the three theories used: Wilson's 1999 model of information seeking behaviour, Libqual+™ and the modern theories of management. This study therefore validates the use of these theories in understanding research and innovation information in university libraries particularly from the perspective of SMEs in developing countries.

The study proposed a model that can be used to streamline and strengthen the R&I system and processes in university libraries. The model developed explains how R&I system picks research problems from the SMEs and sends them to the researchers. The problems are researched and if solutions are found, they are sent to the quality assurance unit which assesses the viability and feasibility of the solutions generated from the research units at the universities. If satisfactory, the solutions are documented and sent to the library, but if not,

they are sent back for more thorough redress. On receiving the solutions, the libraries process these solutions which by now is R&I information and feeds it into the system for dissemination. The system professionally repackages this R&I information in formats that are easily accessible by the SMEs and disseminates it through a database which should be high-tech with virtual capabilities. It is from there that the SMEs pick R&I information that relates to their line of business and apply it for the betterment of their business. This should enable SMEs gain a competitive edge in both national and international trade.

7.8 Limitations of the Study

This study investigated the possibility of university libraries serving agricultural SMEs in the central region of Uganda with R&I information. Uganda is made up of four geo-political regions; the study was limited to only agricultural SMEs found in the central region. Furthermore, SMEs in Uganda are categorised in several sectors like "accommodation, agriculture, construction, education, health, financial, fishing, food processing, forestry, information and communication technology, mining, manufacturing, real estate, recreation and personal trading, transport, and storage utilities (FSD Africa et al. 2015:7). This study only focused on crop industry in the agricultural industry. Furthermore, 71% of the business establishments in Uganda are micro, it is only 18% which are small and 11% are medium (Uganda Bureau of Statistics 2011). This research was therefore limited to the 29% of the business establishments under study.

7.9 Further Research

Based on the findings, discussions and interpretations of this study, below are some of the suggested areas for future research.

1. A similar research should be conducted in other geopolitical regions of Uganda such as the Western, Northern and Eastern regions.
2. Furthermore, a related study can be conducted on SMEs in other sectors such as: health, energy, ICT, education, manufacturing, real estate among others.
3. Finally, this being an exploratory study, it concentrated on SMEs for the start; there is need to carry out deeper and extensive study on university library R&I information services for micro enterprises, which make up 70% of the business establishments in Uganda.

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APPENDICES

Appendix A: Statistical Probability Sampling Table

Table 7.1 Sample sizes for different sizes of target population at a 95 per cent confidence level (assuming data are collected from all cases in the sample)

Target population	Margin of error			
	5%	3%	2%	1%
50	44	48	49	50
100	79	91	96	99
150	108	132	141	148
200	132	168	185	196
250	151	203	226	244
300	168	234	267	291
400	196	291	343	384
500	217	340	414	475
750	254	440	571	696
1 000	278	516	706	906
2 000	322	696	1091	1655
5 000	357	879	1622	3288
10 000	370	964	1936	4899
100 000	383	1056	2345	8762
1 000 000	384	1066	2395	9513
10 000 000	384	1067	2400	9595

The importance of a high response rate

The most important aspect of a probability sample is that it represents the target population. A perfect **representative sample** is one that exactly represents the target population from which it is taken. If 60 per cent of your sample were small service sector companies then, provided the sample was representative, you would expect 60 per cent of the target population to be small service sector companies. You therefore need to obtain as high a response rate as possible to reduce the risk of non-response bias and ensure your sample is representative (Groves and Peytcheva 2008). This is not to say that a low response rate will necessarily result in your sample being biased, just that it is more likely!

In reality, you are likely to have non-responses. Non-respondents are different from the rest of the target population because they have refused to be involved in your research for whatever reason. Consequently, your respondents will not be representative of the target population, and the data you collect may be biased. In addition, each non-response will necessitate an extra respondent being found to reach the required sample size, increasing the cost of your data collection.

You should therefore collect data on refusals to respond to both individual questions and entire questionnaires or interview schedules to check for bias (Section 12.2) and report this briefly in your project report. For returned questionnaires or structured interviews, the American Association for Public Opinion Research (2011) defines four levels of non-response that can be reported for questionnaires and structured interviews:

- **complete refusal**: none of the questions answered;
- **break-off**: less than 50 per cent of all questions answered other than by a refusal or no answer (this therefore includes complete refusal);

Appendix B: Semi-Structured Interview Guide for University Librarians

Interview Schedule for the University Librarians

Preliminary Preparation

- Ensure the purpose of the exercise is explained and well understood by the respondent.
- Ensure consent form is signed by respondent.
- Ascertain that the environment is quiet and conducive for the interview.
- Switch on the recorder and have the note book and pen in place.

Section A: Demographic Information

1. Name of the University Library
2. Indicate gender of respondent
3. What is your highest qualification?
4. For how long have you been working as a University Librarian?

Section B: Management and dissemination of R&I information in University libraries (RQ 1)

5. Does this library collect, store and manage the Research and Innovation (R&I) output of researchers?
6. If yes, how is the R&I information managed and supported? (Options: Institutional Repositories, Research Commons, Rear Collections)
7. Do the R&I Library Unit have specific staff members or librarians deployed to work there?
8. If yes, how many?
9. Do librarians working in R&I units need a unique set of skills to be effective in offering R&I information?
10. If yes, what are some of those unique skills? (Options: Proven leadership skills, communication skills, Repackaging of Information)
11. In general, what do you have to comment about the capacity of researchers in this university in generating R&I information (options: adequacy, relevance, sustainability, research support)

Section C: Access and utilisation of R&I information by SMEs (RQ 4)

12. Which type of users patronise the R&I information managed in this library? (Options: Undergraduate students, Post graduate students, Staff members, Community members, External researchers, Business people and SMEs)
13. Do your think that the R&I information managed in this library could meet some of the SMEs' information needs relating to innovation and entrepreneurship?
14. If yes, what are some of those R&I information needs that can be met by your library's R&I information? (Options: Starting up new businesses enterprises, enhancing business growth, licensing, increasing productivity, increasing sales and marketing Export trade, Identification of training opportunities, Identification of potential investment opportunities, application of credit, Application of patents and trademarks)
15. Has the library put in place an enabling environment for SMEs to seamlessly access and utilise your R&I information?
16. If yes, what mechanism are there in the library to ensure that SMEs easily access and utilise your R&I information? (options: Friendly library policy, required infrastructure, Functional Library CAS & SDI systems, R&I information sharing platforms, Regular marketing of R&I Information, Dissemination of accurate and timely R&I information, Well Staffed R&I Units, Well-equipped R&I Library Units)
17. If Q.15 is no, why is it so?

Section D: Re-engineering research output in University Libraries for SMEs (RQ 2)

18. Do you think there is need to restructure the library systems in order to serve better SMEs with the University's research output?
19. If yes, how can this library re-engineer its library systems and services to effectively offer R&I information to SMEs for them to conduct business and compete profitably? (changing components of the library systems, library staffing, library and staff relations with SMEs, organisational culture and behaviour, university perception to community engagement, library physical environment)
20. Do you think the current R&I information formats of the library need to be repackaged for easier access by SMEs? (options: Repackaging R&I information, Digitising the R&I information, Community engagement, Offering CAS to SMEs through RSS feeds, instant messaging, use of social media, blogs, wikis Including R&I information links on library websites).
21. If yes, how best can R&I information in libraries be repackaged for SMEs? (options; Repackaged into short documentaries, translating it into local languages, News briefs in the media, summarised in University Newsletters Summarised on social media platforms, Making abstracts and indexes conversion into braille, Conversion into music recordings)
22. In your opinion do you think there is need to negotiate for a more situational enabling environment that supports the thriving of R&I information in the library?
23. If yes, which library situational issues need to be negotiated for? (Options: The library's policy and legal framework, Library budget, Library infrastructure, Library staffing, Library equipment, Library systems, Library Standards, Government support for university Libraries, Promotion of research for businesses development)
24. From your experience, for university libraries to effectively serve SMEs with their R&I information what **specific situational issues** need to change or be put in place?
    a. Policies, legal and regulatory framework
    b. Library Budget
    c. Library systems and equipment
    d. Library staffing
    e. Training
    f. Infrastructure
25. In your opinion if university library R&I units are well facilitated, can they offer alternative consultancy or decision support for SMEs when making investment and entrepreneur decisions?
26. In your opinion, do you think University Libraries can significantly contribute to community development through the university's community engagement function?
27. If yes, how? (options: Open Access, Training library staff in the dissemination of R&I information to SMEs, Training conduction information literacy programme for SMEs library users, holding entrepreneurship workshops for SMEs, Holding SMEs library days, Offering start up business consultancy services for SMEs)
28. In your opinion, what are the prospects of CUUL coming up with a strategic leadership role on R&I information in university libraries?
29. How is the library handling the issue of inadequate library funding (increasing library fees, reducing of library fees for external users to attract them more)

Section E: Skills and Competencies needed by SMEs to access R&I information (RQ 3)

30. Do you think the R&I information available in this library is adequate enough to be used by SMEs for their entrepreneurial programmes?
31. If no, is it necessary for the university library to partner with other alternative sources of R&I information for SMEs so as to improve its dissemination to SMEs? (partnering with community libraries, public libraries to disseminate R&I information, partnering with NARO, district extension workers, partnering with the media, increasing the SMEs enthusiasm to visit university library web resources, demystify the misconception that university libraries are purely for academic purposes)
32. In your opinion, what skills and competencies are needed by SMEs to easily access the R&I information collected in this library?
33. What is the possibility of the university library designing an IL programme for SMEs or the business sector library users?
34. Can the library assist SMEs library users with issues of how they can protect their intellectual properties?

Section F: Challenges faced in the provision of R&I information to SMEs (RQ 5)

35. In your opinion what are the main challenges that hinder university libraries in provision of R&I information to SMEs (options: Poor Library equipment, Poor funding and budget cuts, Low library staffing, Poor methods of disseminating the R&I information, poor reading culture, Lack of policy framework, Non-flexible library information system, Lack of infrastructure)
36. Could you please raise suggestions on how best the above challenges can be addressed?

Thanks for Your Time

Appendix C: Interview Guide for Heads of R&I Library Units

Interview Schedule for the Head R&I Library Units

Preliminary Preparation

- Ensure the purpose of the exercise is explained and well understood by the respondent.
- Ensure consent form is signed by respondent.
- Ascertain that the environment is quiet and conducive for the interview.
- Switch on the recorder and have the note book and pen in place.

Section A: Demographic Information

1. Name of the University Library
2. Indicate gender of respondent
1. What is your highest qualification and job title?
2. For how long have you been working in the R&I Unit
3. What are the different types of research collected and managed in the unit?
4. Please briefly explain what you do or what your job entails in the library R&I unit

Section B: Management and dissemination of R&I information in University libraries (RQ 1)

5. Do librarians working in R&I units need a unique set of skills to be effective in offering R&I information?
6. If yes, what are some of those unique skills? (options Proven leadership skills, Change management, communication skills Repackaging of Information)
7. From your experience, what are some of your user's expectations when offering R&I information? (options; system usefulness, ease of use, information quality, friendliness, caring and readiness.)
8. What modern technologies are you applying in the management of R&I information in the library? (Shift from print to electronic collection and storage, are web resources accessible by PwDs, use of social media, adoption of technologies with high user participation and less staff involvement, promotion of self service, disintermediation, seamless use of technology, convenient and ease of using library systems)
9. How prepared are you for technology obsolescence?
10. Does the library have a CAS or SDI system of making users aware of newly acquired R&I information of interest to them? Yes ( ) No ( )
11. If yes, how does the library conduct its CAS & SDI on R&I information?
12. What has been the response of the users to these CAS &SDI alerts?
13. If answer to Q. 12 is no, why?
14. Is there a mechanism of getting feedback on the quality of R&I information services you offer from your users? Yes ( ) No ( )
15. If yes, how do you use it to improve the quality of the generation and processing of R&I information in the university?
16. How has the library positioned itself in the university as a centre for interdisciplinary research?

Section C: Access and utilisation of R&I information by SMEs (RQ 4)

17. In your opinion, do you think SMEs have information needs relating to research and innovation (R&I)?
18. If yes, what are some of those R&I information needs? (options Starting up new businesses enterprises Enhancing business growth, increasing productivity, increasing sales and marketing, Export trade, Identification of training opportunities, application of credit, Identification of potential investment opportunities, licensing, Application of patents and trademarks)

19. Currently what do you think are the SMEs sources of R&I Information? (Options Libraries, Radio, Websites, Brochures, Newspapers, Friends, TV, R&D Unit, Professional networks and collaborations, Social media)
20. Do you think SMEs experience difficulties in their access and utilisation of R&I information? (infrastructure, financial services access, regulatory environment)
21. Do you think University Libraries can act as a formal source of R&I information for SMEs?
22. Is there any communication link between this R&I unit and SMEs?
23. From your opinion do you think it is necessary to ease the access of R&I information for SMEs?
24. If yes, why? (Options: increases productivity, profitability, customer satisfaction helps SMEs to come up with new innovations and promotion of entrepreneurship, Stimulation of more innovation, provides sustainability for new innovations, gives them clues on how to seek expert advice on any difficulties in applying the innovations).

Section D: Re-engineering research output in University Libraries for SMEs (RQ 2)

25. How can University libraries re-engineering their library systems and services to effectively offer R&I information to SMEs? (Digitising the repackaged R&I information, translating it into local languages, Community engagement, Offering CAS to SMEs through RSS feeds, instant messaging, Use of social media, blogs, wikis
26. How can University libraries re-engineer their library functions of acquisition, cataloguing, patrons' management, Serials and Reference to effectively offer R&I information to SMEs? (Options; negotiating the legal framework, providing a political enabling environments, adjusting the library budgets for R&I services, offering more support and promoting research for businesses development).
27. How can university libraries re-engineer their staffing to serve SMEs with R&I information? (Deploying reference librarians to offer reader advice to SMEs, approaching SMEs through community engagement, Value attached to serving SMEs - public vs private universities)
28. How can developmental stakeholders build capacity of the SMEs in the agricultural sector to effectively participate in the access and use of information on agricultural research and innovation in University libraries?
29. Are you comfortable with the way R&I information is packaged and disseminated?
30. If no, how can it be repackaged to optimize its use by SMEs? (PwDs)
31. Is there need for a balance between serving R&I information to students and staff with SMEs?
32. Do you have suggestions on how best University libraries be re-engineered to offer business information support services for the SMEs in order for the SMEs to be able to compete profitably.

Section E: Skills and Competencies needed by SMEs to access R&I information (RQ 3)

33. What is the general perception of the R&I information collected in this library?
34. Do you think the R&I information available in this library is adequate enough to be used by SMEs for their entrepreneurial programmes?
35. Does the library collaborate with other generators of R&I information?
36. If yes, which ones are those? (NARO, District Agricultural Extension officers, Government)
37. In your opinion, what skills and competencies are needed by SMEs to easily access the R&I information collected in this library? (IL skills)
38. What attitude must SMEs have to optimally benefit from this R&I information?

Section F: Challenges faced in the provision of R&I information to SMEs (RQ 5)

39. In your opinion what are the main challenges that hinder the provision of R&I information to SMEs (Options; poorly equipped R&I facilities, poor funding, poor methods of disseminating the R&I information, lack of policy framework, non-flexible information system, low levels of education, poor reading culture, wrong beliefs or unfriendly attitudes between Researchers and SMEs)
40. How best can the above challenges be addressed?

Thanks for Your Time

Appendix D: Interview Guide for University IT Officer

Interview Schedule for University IT Staff

Preliminary Preparation

- Ensure the purpose of the exercise is explained and well understood by the respondent.
- Ensure consent form is signed by respondent.
- Ascertain that the environment is quiet and conducive for the interview.
- Switch on the recorder and have the note book and pen in place.

Section A: Demographic Information

1. Name of the University
2. Indicate gender of respondent
3. What is your highest qualification?
4. For how long have you been working in the University IT department?
5. In what different ways are you offering IT support to the library?

Section B: Management and dissemination of R&I information in University libraries (RQ 1)

6. In general, what do you have to comment about the capacity of researchers in this university in generating R&I information (options: adequacy, relevance, sustainability, research support).

Section C: Access and utilisation of R&I information by SMEs (RQ 4)

7. Do your think that the R&I information managed in this library could meet some of the SMEs' information needs relating to innovation and entrepreneurship?
8. Has the library put in place an enabling IT environment for SMEs to seamlessly access and utilise your R&I information?
9. If yes, what mechanism are there in the library to ensure that SMEs easily access and utilise your R&I information? (options: required IT infrastructure, Functional Library systems, R&I information sharing platforms, Using social media to market of R&I Information,)
10. If Q.8 is no, why is it so?

Section D: Re-engineering research output in University Libraries for SMEs (RQ 2)

11. Do you think there is need to restructure the library systems in order to serve better SMEs with the University's research output?
12. If yes, how can the University IT department support the library to re-engineer its library systems and services to effectively offer R&I information to SMEs for them to conduct business and compete profitably? (options: Repackaging R&I information, Digitising the R&I information, Community engagement, Offering CAS to SMEs through RSS feeds, instant messaging, use of social media, blogs, wikis, Including R&I information links on library websites)
13. Do you think the current R&I information formats of the library need to be repackaged for easier access by SMEs?
14. If yes, how best can R&I information in libraries be repackaged for SMEs? (options; Repackaged into short documentaries, translating it into local languages, News briefs in the media, summarised in University Newsletters Summarised on social media platforms, making abstracts and indexes conversion into braille, conversion into music recordings).
15. In your opinion do you think there is need to negotiate for a more situational enabling environment that supports the thriving of R&I information in the library?
16. If yes, which library situational issues need to be negotiated for? (Options: The library's policy and legal framework, Library budget, Library infrastructure, Library staffing, Library equipment, Library

systems, Library Standards, Government support for university Libraries, Promotion of research for businesses development).

17. What is the feasibility of designing applications for the library that can translate R&I information into local languages which are easily marketable, readable and accessible to SMEs?
18. From your experience, for university libraries to effectively serve SMEs with their R&I information what **specific situational issues** need to change or be put in place?
    a. Policies, legal and regulatory framework
    b. Library Budget
    c. Library systems and equipment
    d. Library staffing
    e. Training
    f. Infrastructure
    g. Virtual communication modes
    h. Internet connectivity
    i. Web access
19. In your opinion, do you think University Libraries can significantly contribute to community development through the university's community engagement function?
20. If yes, how? (options: Open Access, Training library staff in the dissemination of R&I information to SMEs, Training conduction information literacy programme for SMEs library users, Holding entrepreneurship workshops for SMEs, Holding SMEs library days, offering start up business consultancy services for SMEs).
21. Is it possible for the IT department to design or support the designing of special applications that can help the library to:
    a. Disseminate R&I information to SMEs
    b. Repackage R&I information for SMEs
    c. Ease access of the library webpages by SMEs
    d. Orient information literacy skills to SMEs

Section E: Skills and Competencies needed by SMEs to access R&I information (RQ 3)

22. In your opinion, what skills and competencies are needed by SMEs to easily access the R&I information collected in this library?

Section F: Challenges faced in the provision of R&I information to SMEs (RQ 5)

23. In your opinion what are the main challenges that hinder university libraries in provision of R&I information to SMEs (options: Poor Library equipment, Poor funding and budget cuts, Low library staffing, Poor methods of disseminating the R&I information, poor reading culture, Lack of policy framework, Non-flexible library information system, Lack of infrastructure)
24. Could you please raise suggestions on how best the above challenges can be addressed?

Thanks for Your Time

Appendix E: Questionnaire for University Agricultural Academic Staff

Questionnaire for Agricultural Academic staff

Please tick in the appropriate box or fill in the blank space for each question.

Section A: Demographic Information

1. What is the name of the University you are working in?

☐ Makerere University ☐ Kyambogo University ☐ Gulu University ☐ Busitema University

☐ Uganda Martyrs University ☐ Ndejje University ☐ Uganda Christian University

2. What is your highest academic level of qualification?
   ☐ Bachelors ☐ PGD ☐ Masters ☐ PhD

3. What is your Job title?
   ☐ Professor ☐ Ass. Professor ☐ Senior Lecturer ☐ Lecturer

   ☐ Assistant Lecturer ☐ Teaching Assistant ☐ Part time

   Other……

4. What is your gender?
   ☐ Male ☐ Female

5. In what age bracket are you?
   ☐ 20-40 years ☐ 41-60 years ☐ 61 and above

6. What is your Telephone contact? ……..
7. What is your area(s) of specialisation?

   ……

   ……

Section B: Assessment of Library Research and Innovation (R&I) information services (RQ 1)

8. Please assess the performance of University library's R&I services as per the following dimensions (Key: Very Poor – VP, Poor – P, Fair – F, Good – G and Very Good – VG).

	Components of measuring service quality	**VP**	**P**	**F**	**G**	**VG**
When it comes to Employee relations		☐	☐	☐	☐	☐
	Employees who instil confidence in users	☐	☐	☐	☐	☐
	Giving users individual attention	☐	☐	☐	☐	☐
	Employees who are consistently courteous	☐	☐	☐	☐	☐
	Readiness to respond to users' questions	☐	☐	☐	☐	☐
	Employees who have the knowledge to answer user questions	☐	☐	☐	☐	☐
	Employees who deal with users in a caring fashion	☐	☐	☐	☐	☐
	Employees who understand the needs of their users	☐	☐	☐	☐	☐

	Willingness to help users	☐	☐	☐	☐	☐
	Dependability in handling users‘ service problems	☐	☐	☐	☐	☐
When it comes to Library Systems						
	Making electronic resources accessible from my home or office	☐	☐	☐	☐	☐
	A library Web site enabling me to locate information on my own	☐	☐	☐	☐	☐
	The printed library materials I need for my work	☐	☐	☐	☐	☐
	The electronic information resources I need	☐	☐	☐	☐	☐
	Modern equipment that lets me easily access needed information	☐	☐	☐	☐	☐
	Easy-to-use access tools that allow me to find things on my own	☐	☐	☐	☐	☐
	Making information easily accessible for independent use	☐	☐	☐	☐	☐
	Print and/or electronic journal collections I require for my work	☐	☐	☐	☐	☐
When it comes to the Library as a place						
	Library space that inspires study and learning	☐	☐	☐	☐	☐
	Quiet space for individual activities	☐	☐	☐	☐	☐
	A comfortable and inviting location	☐	☐	☐	☐	☐
	A getaway for study, research & innovation	☐	☐	☐	☐	☐
	Community space for group learning and group study	☐	☐	☐	☐	☐
When it comes to the general quality of Service						
	How would you rate the overall quality of the service provided by the library	☐	☐	☐	☐	☐

9. Please indicate the degree to which you agree with the following statements (Key: Strongly Disagree – SD, Disagree – D, Undecided – U, Agree – A and Strongly Agree – SA)

S/No.	Dimension	SD	D	U	A	SA
1	The Library helps me stay abreast of developments in the field(s) of interest	☐	☐	☐	☐	☐
2	The Library aids my advancement in my academic discipline	☐	☐	☐	☐	☐
3	The Library enables me to be more efficient in my academic pursuits	☐	☐	☐	☐	☐
4	The Library helps me distinguish between trustworthy and untrustworthy information	☐	☐	☐	☐	☐
5	The Library provides me with the information skills I need in my work or study	☐	☐	☐	☐	☐
6	In general, I am satisfied with the way in which I am treated in the Library	☐	☐	☐	☐	☐
7	In general, I am satisfied with the Library support for my learning, research and/or teaching needs	☐	☐	☐	☐	☐

10. Please indicate your library usage patterns (Key: All the time-A, Daily-D, Occasionally-O, Rarely-R, Never-N)

S/No.	Dimension	A	D	O	R	N
1	How often do you use resources on library premises?	☐	☐	☐	☐	☐
2	How often do you access library resources through the library web page?	☐	☐	☐	☐	☐
3	How often do you use non-library gateways like google, yahoo for your information needs?	☐	☐	☐	☐	☐

11. Do you have an idea how the library collects, stores and manages the Research and Innovation (R&I) output of researchers in the university?

☐ Yes ☐ No ☐ I do not know

12. If yes, how is the R&I information managed and supported by the library?

☐ Institutional Repositories ☐ Research Commons ☐ Rear Collections

Other……

13. Do librarians working in R&I units need a unique set of skills to be effective in offering R&I information?

☐ Yes ☐ No ☐ I do not Know

14. If yes, what are some of those unique skills

☐ Proven leadership skills, ☐ Communication skills ☐ Repackaging of Information

Other……

Section C: Access and utilisation of R&I information by SMEs (RQ 4)

15. Do your think that the Research you are currently or about to be engaged in could meet some of the Small Medium Enterprises' (SMEs) information needs relating to innovation and entrepreneurship?

☐ Yes ☐ No ☐ I do not Know

16. If yes, what are some of those R&I information needs that can be met by your research?

☐ Starting up new businesses enterprises ☐ Enhancing business growth, ☐ Licensing

☐ Increasing productivity, ☐ Increasing sales and marketing ☐ Export trade,

☐ Identification of training opportunities, ☐ Application of credit

☐ Identification of potential investment opportunities, ☐ Application of patents and trademarks

Others……..

17. Has the library put in place an enabling environment for SMEs to seamlessly access and utilise R&I information generated in this university?

☐ Yes ☐ No ☐ I do not know

18. If yes, what mechanism are there in the library to ensure that SMEs easily access and utilise this R&I information?

☐ Friendly library policy ☐ Required infrastructure ☐ Functional Library CAS & SDI systems

☐ R&I information sharing platforms ☐ Regular marketing of R&I Information

☐ Dissemination of accurate and timely R&I information ☐ Well-Staffed R&I Units

☐ Well-equipped R&I Library Units

Others……..……..

19. If Q.15 is no, could you be knowing the reason why?

……

……

20. In your opinion, what could be some of the key expectations of SMEs when they come to the University library for R&I information?

☐ Empathy ☐ Responsiveness ☐ Assurance and Reliability of the R&I information

Other…….

Section D: Re-engineering research output in University Libraries for SMEs (RQ 2)

21. Do you think there is need to restructure the library systems in order to serve better SMEs with the University's research output?

☐ Yes ☐ No ☐ I do not know

22. If yes, how can this library re-engineer its library systems and services to effectively offer R&I information to SMEs for them to conduct business and compete profitably?

☐ Repackaging R&I information ☐ Digitising the R&I information

☐ Community engagement ☐ Offering CAS to SMEs through RSS feeds, instant messaging

☐ Use of social media, blogs, wikis ☐ Including R&I information links on library websites

Other…….

23. Do you think the current R&I information formats of the library need to be repackaged for easier access by SMEs?

☐ Yes ☐ No ☐ I do not know

24. If yes, how best can R&I information in libraries be repackaged for SMEs

☐ Repackaged into short documentaries ☐ News briefs in the media

☐ Summarised in University newsletters ☐ Summarised on social media platforms

☐ Making abstracts and indexes ☐ Conversion into braille

☐ Conversion into music recordings

Other……

25. From your experience, for university libraries to effectively serve SMEs with their R&I information what specific policies, library systems, equipment, library staffing and training need to change or be put in place?

……..

……..

……..

……..

26. In your opinion if university library R&I units are well facilitated, can they offer alternative consultancy or decision support for SMEs when making investment and entrepreneur decisions?

☐ Yes ☐ No ☐ I do not know

27. In your opinion, do you think University Libraries can significantly contribute to community development through the university's community engagement function?

☐ Yes ☐ No ☐ I do not know

28. If yes how?

☐ Open Access ☐ Training library staff in the dissemination of R&I information to SMEs

☐ Training ☐ Conduction information literacy programme for SMEs library users

☐ Holding entrepreneurship workshops for SMEs ☐ Holding SMEs library days

☐ Offering start up business consultancy services for SMEs

Other……

Section E: Challenges faced in the provision of R&I information to SMEs (RQ 5)

29. In your opinion what are the main challenges that hinder university libraries in provision of R&I information to SMEs

☐ Poor Library equipment ☐ Poor funding and budget cuts ☐ Low library staffing

☐ Poor methods of disseminating the R&I information ☐ Poor reading culture

☐ Lack of policy framework ☐ Non-flexible library information system

☐ Lack of infrastructure

Other……..

30. Could you please raise suggestions on how best the above challenges can be addressed?

……..

……..

……

……

31. Is there anything you would like to suggest to improve the delivery of R&I information by the University Library?

……

……

……

Thanks for Your Time

Appendix F: Questionnaire for University Agricultural Graduate Students

Questionnaire for Agricultural postgraduate students

Please tick in the appropriate box or fill in the blank space for each question.

Section A: Demographic Information

1. What is the name of the University you are pursuing your post graduate studies from?
   ☐ Makerere University ☐ Kyambogo University ☐ Gulu University ☐ Busitema University

   ☐ Uganda Martyrs University ☐ Ndejje University ☐ Uganda Christian University

2. What is the level of the programme you have enrolled for?
   ☐ PGD ☐ Masters ☐ PhD

3. What is your year of study?
   ☐ First Year ☐ Second Year ☐ Third Year ☐ Forth year and above

4. What programme are you pursuing?
   …….

5. What is your Telephone contact? …….

6. What is your gender?
   ☐ Male ☐ Female

7. In what age bracket are you?
   ☐ 20-40 years ☐ 41-60 years ☐ 61 and above

Section B: Assessment of Library Research and Innovation (R&I) information services (RQ 1)

8. Please assess the performance of University library's R&I services as per the following dimensions (Key: Very Poor – VP, Poor – P, Fair – F, Good – G and Very Good – VG).

	Components of measuring service quality	**VP**	**P**	**F**	**G**	**VG**
When it comes to Employee relations		☐	☐	☐	☐	☐
	Employees who instil confidence in users	☐	☐	☐	☐	☐
	Giving users individual attention	☐	☐	☐	☐	☐
	Employees who are consistently courteous	☐	☐	☐	☐	☐
	Readiness to respond to users' questions	☐	☐	☐	☐	☐
	Employees who have the knowledge to answer user questions	☐	☐	☐	☐	☐
	Employees who deal with users in a caring fashion	☐	☐	☐	☐	☐
	Employees who understand the needs of their users	☐	☐	☐	☐	☐
	Willingness to help users	☐	☐	☐	☐	☐
	Dependability in handling users' service problems	☐	☐	☐	☐	☐
When it comes to Library Systems						
	Making electronic resources accessible from my home or office	☐	☐	☐	☐	☐
	A library Web site enabling me to locate information on my own	☐	☐	☐	☐	☐
	The printed library materials I need for my work	☐	☐	☐	☐	☐
	The electronic information resources I need	☐	☐	☐	☐	☐

	Modern equipment that lets me easily access needed information	☐	☐	☐	☐	☐
	Easy-to-use access tools that allow me to find things on my own	☐	☐	☐	☐	☐
	Making information easily accessible for independent use	☐	☐	☐	☐	☐
	Print and/or electronic journal collections I require for my work	☐	☐	☐	☐	☐
When it comes to the Library as a place						
	Library space that inspires study and learning	☐	☐	☐	☐	☐
	Quiet space for individual activities	☐	☐	☐	☐	☐
	A comfortable and inviting location	☐	☐	☐	☐	☐
	A getaway for study, learning or research	☐	☐	☐	☐	☐
	Community space for group learning and group study	☐	☐	☐	☐	☐
When it comes to the general quality of Service						
	How would you rate the overall quality of the service provided by the library	☐	☐	☐	☐	☐

9. Please indicate the degree to which you agree with the following statements (Key: Strongly Disagree – SD, Disagree – D, Undecided – U, Agree – A and Strongly Agree – SA)

S/No.	Dimension	SD	D	U	A	SA
1	The Library helps me stay abreast of developments in the field(s) of interest	☐	☐	☐	☐	☐
2	The Library aids my advancement in my academic discipline	☐	☐	☐	☐	☐
3	The Library enables me to be more efficient in my academic pursuits	☐	☐	☐	☐	☐
4	The Library helps me distinguish between trustworthy and untrustworthy information	☐	☐	☐	☐	☐
5	The Library provides me with the information skills I need in my work or study	☐	☐	☐	☐	☐
6	In general, I am satisfied with the way in which I am treated in the Library	☐	☐	☐	☐	☐
7	In general, I am satisfied with the Library support for my learning, research and/or teaching needs	☐	☐	☐	☐	☐

10. Please indicate your library usage patterns (Key: All the time-A, Daily-D, Occasionally-O, Rarely-R, Never-N)

S/No.	Dimension	A	D	O	R	N
1	How often do you use resources on library premises?	☐	☐	☐	☐	☐
2	How often do you access library resources through the library web page?	☐	☐	☐	☐	☐
3	How often do you use non library gateways like google, yahoo for your information needs?	☐	☐	☐	☐	☐

11. Do you have an idea how the library collects, stores and manages the Research and Innovation (R&I) output of researchers in the university?

☐ Yes ☐ No ☐ I do not know

12. If yes, how is the R&I information managed and supported by the library?

☐ Institutional Repositories ☐ Research Commons ☐ Rear Collections

Other……

13. Do librarians working in R&I units need a unique set of skills to be effective in offering R&I information?

☐ Yes ☐ No ☐ I do not Know

14. If yes, what are some of those unique skills

☐ Proven leadership skills, ☐ Communication skills ☐ Repackaging of Information

Other……

Section C: Access and utilisation of R&I information by SMEs (RQ 4)

15. Do your think that the Research you are currently or about to be engaged in could meet some of the Small and Medium Enterprises'(SMEs) information needs relating to innovation and entrepreneurship?

☐ Yes ☐ No ☐ I do not Know

16. If yes, what are some of those R&I information needs that can be met by your research?

☐ Starting up new businesses enterprises ☐ Enhancing business growth, ☐ Licensing

☐ Increasing productivity, ☐ Increasing sales and marketing ☐ Export trade,

☐ Identification of training opportunities, ☐ Application of credit

☐ Identification of potential investment opportunities, ☐ Application of patents and trademarks

Others……..

17. Has the library put in place an enabling environment for SMEs to seamlessly access and utilise R&I information generated in this university?

☐ Yes ☐ No ☐ I do not know

18. If yes, what mechanism are there in the library to ensure that SMEs easily access and utilise this R&I information?

☐ Friendly library policy ☐ Required infrastructure ☐ Functional Library CAS & SDI systems

☐ R&I information sharing platforms ☐ Regular marketing of R&I Information

☐ Dissemination of accurate and timely R&I information ☐ Well Staffed R&I Units

☐ Well-equipped R&I Library Units

Others……..……..

19. If Q.15 is no, could you be knowing the reason why?

……

……

20. In your opinion, what could be some of the key expectations of SMEs when they come to the University library for R&I information?

☐ Empathy ☐ Responsiveness ☐ Assurance and Reliability of the R&I information

Other……

Section D: Re-engineering research output in University Libraries for SMEs (RQ 2)

21. Do you think there is need to restructure the library systems in order to serve better SMEs with the University's research output?

☐ Yes ☐ No ☐ I do not know

22. If yes, how can this library re-engineer its library systems and services to effectively offer R&I information to SMEs for them to conduct business and compete profitably?

☐ Repackaging R&I information ☐ Digitising the R&I information

☐ Community engagement ☐ Offering CAS to SMEs through RSS feeds, instant messaging

☐ Use of social media, blogs, wikis ☐ Including R&I information links on library websites

Other…….

23. Do you think the current R&I information formats of the library need to be repackaged for easier access by SMEs?

☐ Yes ☐ No ☐ I do not know

24. If yes, how best can R&I information in libraries be repackaged for SMEs

☐ Repackaged into short documentaries ☐ News briefs in the media

☐ Summarised in University newsletters ☐ Summarised on social media platforms

☐ Making abstracts and indexes ☐ Conversion into braille

☐ Conversion into music recordings

Other……

25. From your experience, for university libraries to effectively serve SMEs with their R&I information what specific policies, library systems, equipment, library staffing and training need to change or be put in place?

……..

……..

……..

……..

26. In your opinion if university library R&I units are well facilitated, can they offer alternative consultancy or decision support for SMEs when making investment and entrepreneur decisions?

☐ Yes ☐ No ☐ I do not know

27. In your opinion, do you think University Libraries can significantly contribute to community development through the university's community engagement function?

☐ Yes ☐ No ☐ I do not know

28. If yes how?

☐ Open Access ☐ Training library staff in the dissemination of R&I information to SMEs

☐ Training ☐ Conduction information literacy programme for SMEs library users

☐ Holding entrepreneurship workshops for SMEs ☐ Holding SMEs library days

☐ Offering start up business consultancy services for SMEs

Other……

Section E: Challenges faced in the provision of R&I information to SMEs (RQ 5)

29. In your opinion what are the main challenges that hinder university libraries in provision of R&I information to SMEs

☐ Poor Library equipment ☐ Poor funding and budget cuts ☐ Low library staffing

☐ Poor methods of disseminating the R&I information ☐ Poor reading culture

☐ Lack of policy framework ☐ Non-flexible library information system

☐ Lack of infrastructure

Other……..

30. Could you please raise suggestions on how best the above challenges can be addressed?

……..

……..

……

……

31. Is there anything you would like to suggest to improve the delivery of R&I information by the University Library?

……

……

……..

Thanks for Your Time

Appendix G: Questionnaire for SME Respondents

Questionnaire for SMEs

Please tick in the appropriate box or fill in the blank space for each question.

Section A: Demographic Information

1. What is your gender? ☐Male ☐Female

2. In what age bracket are you?
   ☐< 19 ☐20-40 years ☐41-60 years ☐> 61

3. What is your level of education?
   ☐No formal education ☐Primary ☐Secondary ☐Tertiary ☐University

4. What is the name of your business enterprise?

   ……..

5. What is your Telephone contact? …….

6. What is the size of your business? ☐Small enterprise[1] ☐Medium enterprise[2]

7. For how long has your business been in existence?
   ☐< 1 year ☐1-2 years ☐3-4 years ☐5-6 years

   ☐7-8 years ☐9-10 years ☐11-12 years ☐> 12 years

8. Where is your business located?

Kampala: ☐Kampala Central ☐Nakawa ☐Makindye ☐Rubaga ☐Kawempe

Central Region: ☐Bukomasimbi ☐Buikwe ☐ Butambala ☐Gomba ☐Kalungu

☐Buvuma islands ☐Kayunga ☐Kiboga ☐Kyankwanzi ☐Luweero ☐ Lwengo

☐Kalangala islands ☐Lyantonde ☐Masaka ☐Mityana ☐Mpigi ☐Mubende,

☐Mukono ☐Nakaseke ☐ Nakasongora ☐Rakai ☐Sembabule ☐Wakiso

9. Please briefly explain what your business is about?

…….

…….

Section B: Access and utilisation of R&I information by SMEs (RQ 3)

[1] A small enterprise is one with 5-50 workers and having a total asset worth of up to 360M UGx

[2] A Medium enterprise is one with over 50 workers having a total asset worth of 360M – 30 Billion UGx

10. Does your SME have information needs relating to research and innovation (R&I)?

☐Yes ☐No ☐I do not know

11. If yes, what are some of those R&I information needs?

☐Starting up new businesses enterprises ☐Enhancing business growth ☐ Licensing

☐Increasing productivity, ☐Increasing sales and marketing ☐ Export trade,

☐Identification of training opportunities, ☐Application of credit

☐Identification of potential investment opportunities ☐Application of patents and trademarks

☐Information on Finance/Capital/Loans ☐ Information on local markets

☐Information on International markets and foreign exchange ☐Information on appropriate technologies

☐Information on Business laws and taxation ☐Information on business management skills

☐Information on business competitors ☐Information on Government policies and regulations

☐Information on security ☐Information on Trade Fair, Tender and Contracts

☐Back certain business decision position

12. What are your SMEs' key sources of R&I Information?

☐Libraries ☐Radio ☐Websites ☐Brochures ☐Newspapers

☐TV ☐R&D Unit ☐Mobile phones ☐Fliers, ☐NGOs

☐Innovation experts ☐Local Government Extension Officers ☐NARO Extension Officers

☐Professional networks and collaborations ☐Social media ☐Friends

Others…….

13. Is your SME or you a member of any professional group, association or network organisation?

☐Yes ☐No ☐I do not know

14. Do you get R&I information for your SME from any Professional group or body?

☐Yes ☐No ☐I do not know

15. If yes, what are some of those professional bodies?

☐Uganda Farmers Association ☐ Private Sector Foundation ☐Ministry of Trade, Industry & Coops

☐Ministry of Finance, Planning and Economic Development ☐ Business Information Solutions

☐Ministry of Agriculture, animal industry and fisheries ☐National Agricultural Organisation (NARO)

☐Network Uganda ☐BISnet- Uganda ☐Uganda Chamber of Commerce and Industry

☐Uganda Investment Authority

Other……..

16. What mechanism do you use to ensure that your SME makes better-informed and more reliable entrepreneur decisions? (Follow stages of; problem identification, problem definition, problem resolution and solution statement)

……..

……..

17. How do you utilise the R&I information you access?

……..

18. Does the R&I information you utilise help you to come up with new innovations in your business?

☐Yes ☐No ☐I Do not Know

19. If yes, can you name some examples of innovations you have developed and are using in your business

……..

20. How sustainable are the new innovations you have developed?

…….

21. Are there any difficulties you experience in applying innovations in your business?

☐Yes ☐No ☐I do not know

22. If yes, what are some of those difficulties?

……

…….

23. What do you have to comment on R&I information transfer from agricultural Extension or NAADS

……..

…….

Section C: Factors that influence access and utilisation of R&I information by SMEs (RQ 4)

24. What factors affect your SMEs access and utilisation R&I information?

☐Timeliness, ☐Accuracy of the information, ☐Information sharing platforms

☐Functionality of the formal R&I information sources ☐Marketing of R&I information

☐Financial services, regulatory framework ☐Open innovation ☐Infrastructure

Other…….

23. Have you adapted to any new innovation/technology/practices based on R&I information you have received

☐Yes ☐No ☐I do not Know

25. How has the adoption of the innovation impacted your business?

☐ Improved business growth ☐Invented New technology ☐Increased sales

☐ Increased productivity ☐Increased profitability ☐Improved customer satisfaction

☐ Beat competitors ☐Promoted entrepreneurship ☐Better decision support for entrepreneurial and investment choice

Other…… …….

26. Are you aware of the opportunity of banks offering flexible leases of acquiring machinery and utilisation of R&I information?

☐Yes ☐No ☐I do not Know

27. If yes have you taken advantage of it and what was your experience?
……
……..…..

28. If response to Q.27 is no, why?

……..

…….

Section C: Re-engineering research output in University Libraries for SMEs (RQ 2)

29. Are you aware that R&I information is generated in Universities and kept in University Libraries?

☐Yes ☐No ☐I do not know

30. From your experience have you ever used a university library to search for any of your SME business information need?

☐Yes ☐No ☐I do not know

31. If no, why?

☐Not aware of this service ☐The library is far ☐Information is complicated to retrieve

☐Found irrelevant information

Other…….…….

32. If Q. 25 is yes, what kind of information exactly were you searching for from the University library?

……

33. How long have you been using the library searching for this kind of information?

……..

34. What has been the impact of this R&I information in your business work?

…….

35. Do you think University libraries can be formal sources of R&I information for SMEs.

☐Yes ☐No ☐Do not Know

36. If Yes why?

☐They can offer business information support services for the SMEs. ☐They can offer consultancy services

☐They can help SMEs evaluate the most suitable R&I information for their business ☐Advisory services

Other…….

37. Based on your opinion in Q. 30 above do you think your SME would need training on how best to access and use R&I information in the university library?

☐Yes ☐No ☐I do not know

38. If yes, in what ways would you need to be trained?

☐Information literacy ☐Information evaluation, ☐Data base searching

Other……..

39. From which platform or service do think your SME can best access and utilise R&I information in University libraries?

☐Digitising of the R&I information ☐Supporting and promoting research for businesses development

☐Repackaging of R&I information ☐Use of social media, blogs, wikis

☐Offering CAS and SDI to SMEs through RSS feeds and instant messaging ☐Community engagement

☐Creation of a friendly environment for SMEs to access R&I information

40. Do you think R&I information in University libraries needs to be repackaged in order to be optimally accessed and utilised?

☐Yes ☐No ☐I do not Know

41. If yes, how best would you like it to be repackaged?

☐Use of pictures and drawings ☐Use of symbols and signs ☐Change of formats from print to audio

☐Translate the language from English to a local language ☐Change of format from print to video

☐Organise regular sessions of R&I exposes used, participatory learning ☐Poster form

☐ CDROM format ☐Online format ☐Radio format (Using radios)

☐Television format (Using Television) ☐Through Braille ☐Printed format

☐Verbal format through extension workers and Government Business Leaders. ☐Use of Social media

Others, ……..……..

Section D: Challenges faced in the provision of R&I information to SMEs (RQ 5)

42. In your opinion what are the main challenges that hinder the provision of R&I information to SMEs

☐Poorly equipped R&I information sources ☐Poor funding ☐Weak or lack of policy framework

☐Poor methods of disseminate the R&I information ☐Non-flexible information system

☐Lack of Infrastructure

Other……..

43. How best can these challenges be addressed?

……

……

44. Is there anything you would like to suggest to improve the delivery of R&I information by the University Library?

……

Thanks for Your Time

Appendix H: Gulu Research Ethical Committee (GUREC) Clearance

GULU UNIVERSITY

P.O. Box 166 Gulu Uganda
E-mail: emilio.ovuga@gmail.com
lekobai@gmail.com

Tel: 256-4714-32096
Fax: 256-4714-32913

RESEARCH ETHICS COMMITTEE

Date: 06/02/2017

REC APPROVAL NOTICE

To: Mr. Robert Buwule
School of Political Sciences
University of KwaZulu-Natal
South Africa

Re: **Application No. GUREC 01/02/2017**
Title: Re-Engineering Research and Innovation Information in University Libraries in Uganda for Small and Medium Enterprises (SMEs) in the Agricultural Sector:
Version 2, 27-01-2017

Type: [**X**] Initial Review
[ ] Protocol Amendment
[ ] Letter of Amendment (LOA)
[ ] Continuing Review
[ ] Material Transfer Agreement
[ ] Other, Specify:_____

I am pleased to inform you that at the 22 convened meeting on 19th January 2017, the GUREC committee meeting voted to approve the above referenced application.

Approval of the research is for the period of 3rd February 2017 to 2nd February 2018.

This research is considered [risk level] for pediatric risk category. [√] Check box if Not Applicable.

GULU UNIVERSITY
INSTITUTIONAL REVIEW COMMITTEE
APPROVED
06 FEB 2017
FACULTY OF MEDICINE
P. O. Box 166, Gulu

As Principal Investigator of the research, you are responsible for fulfilling the following requirements of approval:

1. All co-investigators must be kept informed of the status of the research.
2. Changes, amendments, and addenda to the protocol or the consent form must be submitted to the REC for re-review and approval prior to the activation of the changes. The REC application number assigned to the research should be cited in any correspondence.
3. Reports of unanticipated problems involving risks to participants or other must be submitted to the REC. New information that becomes available which could change the risk: benefit ratio must be submitted promptly for REC review.

4. Only approved consent forms are to be used in the enrollment of participants. All consent forms signed by participants and/or witnesses should be retained on file. The REC may conduct audits of all study records, and consent documentation may be part of such audits.

5. Regulations require review of an approved study not less than once per 12-month period. Therefore, a continuing review application must be submitted to GUREC eight weeks prior to the above expiration date of 2nd February 2018 in order to continue the study beyond the approved period. Failure to submit a continuing review application in a timely fashion may result in suspension or termination of the study, at which point new participants may not be enrolled and currently enrolled participants must be taken off the study.

6. You are required to register the research protocol with the Uganda National Council for Science and Technology (UNCST) for final clearance to undertake the study in Uganda.

The following is the list of all documents approved in this application by GUREC:

	Document	Language	Version	Version Date
1	Proposal	English	Version 2	27-1-2017
2	Data Collection Tools	English	Version 1	27-1-2017
3	Informed consent documents	English	Version 1	27-1-2017

GULU UNIVERSITY
INSTITUTIONAL REVIEW COMMITTEE
APPROVED
06 FEB 2017
FACULTY OF MEDICINE
P. O. Box 166, Gulu

Signed,

Prof. Emilio Ovuga
Chairperson, GUREC

GULU UNIVERSITY
INSTITUTIONAL REVIEW COMMITTEE
APPROVED
06 FEB 2017
FACULTY OF MEDICINE
P. O. Box 166, Gulu

Inbox
Starred
Snoozed
Important
Chats
Sent
Drafts 29
All Mail

Robert
Galinnya Stephanas
Wynand van der Walt
Anajoyce Samuel
Anke McCallum
Dimakatso Margret Malungar
edward mukiibi
Francis Ekwaro
Keegan Fisher

Research Management - UNCST <research@uncst.go.ug> Feb 24, 2017, 8:10 AM
to me

Uganda National Council for Science and Technology
(Established by Act of Parliament of the Republic of Uganda)

UNCST

Our Ref: IS6ES 2017-02-24

Dear Robert Buwule,

I am pleased to inform you that on **24/02/2017**, the Uganda National Council for Science and Technology (UNCST) approved your study titled, **Re-Engineering Research and Innovation Information in University Libraries in Uganda for Small and Medium Enterprises (SMEs) in the Agricultural Sector**. The Approval is valid for the period of **24/02/2017** to **24/02/2019**.

Your study reference number is **IS6ES**. Please, cite this number in all your future correspondences with UNCST in respect of the above study.

Please, note that as Principal Investigator, you are responsible for:

1. Keeping all co-investigators informed about the status of the study.
2. Submitting any changes, amendments, and addenda to the study protocol or the consent form, where applicable, to the designated local Research Ethics Committee (REC) or Lead Agency, where applicable, for re-review and approval prior to the activation of the changes.
3. Notifying UNCST about the REC or lead agency approved changes, where applicable, within five working days.
4. For clinical trials, reporting all serious adverse events promptly to the designated local REC for review with copies to the National Drug Authority.
5. Promptly reporting any unanticipated problems involving risks to study subjects/participants to the UNCST.
6. Providing any new information which could change the risk/benefit ratio of the study to the UNCST for review.
7. Submitting annual progress reports electronically to UNCST. Failure to do so may result in termination of the research project.

Please, note that this approval includes all study related tools submitted as part of the application.

Yours sincerely,

Hellen N. Opolot
For: Executive Secretary
UGANDA NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

UNIVERSITY OF
KWAZULU-NATAL
Information Studies
School of Social Sciences
University of KwaZulu-Natal
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Scottsville 3209, South Africa
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Fax: +27 (0) 33 2605092
mutulas@ukzn.ac.za

9th November, 2016

The Executive Director,
Uganda National Council of Science and Technology
P. O. Box 6884, Kampala
info@uncst.go.ug

Dear Sir/Madam,

RE: APPLICATION FOR RESEARCH DATA COLLECTION

Reference is made to the above subject.

Mr. Robert Stalone Buwule is a duly registered PhD student in the Information Studies Programme at the University of KwaZulu-Natal, in South Africa. As part of the requirement for the award of the doctoral degree, he is undertaking a study on "Re-Engineering Research and Innovation Information in University Libraries in Uganda for Small and Medium Enterprises (SMEs)". The study covers six university libraries and Agricultural based SMEs in Uganda.

The purpose of this letter is to kindly request a written permission from your office to enable him collect data from the six universities and Agricultural SMEs in the central region of Uganda. Possible dates for data collection are flexible within April to October 2017. The data will be collected through survey questionnaire and interviews. Your authorization to this request will be highly appreciated.

Yours sincerely,

Professor Stephen Mutula
Dean & Head: School of Social Sciences

9th November, 2016

UNIVERSITY OF
KWAZULU-NATAL

Information Studies
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Fax: +27 (0) 33 2605092
mutulas@ukzn.ac.za

The Chairperson
Local Research Ethics Committee
Gulu University
P. O. Box 166, Gulu

Attn: Prof. Emilio Ovuga

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Fax: +27 (0) 33 2605092
mutulas@ukzn.ac.za

Vice Chancellor,
Makerere University
P.O.Box 7062,
Kampala

Attn: The University Librarian

Dear Sir/Madam,

RE: APPLICATION FOR RESEARCH DATA COLLECTION

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9th November, 2016

Vice Chancellor,
Uganda Christian University
P.O.Box 4, Mukono
info@ucu.ac.ug

Attn: The University Librarian

Dear Sir/Madam,

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9th November, 2016

Vice Chancellor,
Uganda Martyrs University
P. O. Box 5498, Kampala
pro@umu.ac.ug

Attn: The University Librarian

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Professor Stephen Mutula
Dean & Head: School of Social Sciences

9th November, 2016

Vice Chancellor,
Kyambogo University
P.O.Box 1, Kyambogo
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9th November, 2016

Vice Chancellor,
Gulu University
P.O.Box 166, Gulu
pro@gu.ac.ug

UNIVERSITY OF
KWAZULU-NATAL
Information Studies
School of Social Sciences
University of KwaZulu-Natal
Private Bag X01
Scottsville 3209, South Africa
Tel: +27 (0) 33 2605571
Fax: +27 (0) 33 2605092
mutulas@ukzn.ac.za

Attn: The University Librarian

Dear Sir/Madam,

RE: APPLICATION FOR RESEARCH DATA COLLECTION

Reference is made to the above subject.

Mr. Robert Stalone Buwule is a duly registered PhD student in the Information Studies Programme at the University of KwaZulu-Natal, in South Africa. As part of the requirement for the award of the doctoral degree, he is undertaking a study on "Re-Engineering Research and Innovation Information in University Libraries in Uganda for Small and Medium Enterprises (SMEs) ". The study covers six university libraries and Agricultural based SMEs in Uganda.

The purpose of this letter is to kindly request a written permission from your office to enable him collect data from your University. Possible dates for data collection are flexible within April to October 2017. The data will be collected through survey questionnaire and interviews. Your authorization to this request will be highly appreciated.

Yours sincerely,

Professor Stephen Mutula
Dean & Head: School of Social Sciences

9th November, 2016

Vice Chancellor,
Ndejje University
P.O.Box 7062, Kampala
pro@nu.ac.ug

UNIVERSITY OF
KWAZULU-NATAL
Information Studies
School of Social Sciences
University of KwaZulu-Natal
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Yours sincerely,

Professor Stephen Mutula
Dean & Head: School of Social Sciences

MAKERERE UNIVERSITY

P. O. Box 7062 Kampala Uganda
Cables: "MAKUNIKA" Kampala
Website: www.makerere.ac.ug

Tel: (Gen) +256-414-532045
Fax: +256-414-533640
E-mail: dvc@acadreg.mak.ac.ug

OFFICE OF THE FIRST DEPUTY VICE CHANCELLOR
(Academic Affairs)

Ernest Okello Ogwang (Ph.D)

03 January 2017

Mr. Robert Stalone Buwule
School of Social Sciences
University of Kwazulu-Natal

Dear Mr. Buwule

RE: PERMISSION TO CARRY OUT RESEARCH AT MAKERERE UNIVERSITY

Reference is made to your letter dated November 17, 2016 requesting for permission to collect data for your study, ***"Re-Engineering Research and Innovation Information in Universality Libraries in Uganda for Small and Medium Enterprises (SMEs) in the Agricultural Sector".***

The purpose of this letter is to grant you permission engage in the above mentioned exercise. Makerere will however oblige you to share with it findings specific to the Institution, as we partner together to improve the Institution of Makerere University.

Wishing you the best in your research.

Okello Ogwang (Ph.D)
DEPUTY VICE CHANCELLOR (ACADEMIC AFFAIRS)

c.c. Professor Stephen Mutula
Dean & Head, School of Social Sciences
University of Kwazulu-Natal

In future correspondence please quote the reference number above

UGANDA CHRISTIAN UNIVERSITY

A Centre of Excellence in the Heart of Africa

Office of the Vice Chancellor

7th December 2016

Professor Stephen Mutula
Dean & Head, School of Social Sciences,
University of Kwazulu-Natal,
Durban, South Africa.

Dear Prof. Mutula,

RE: Authorisation to collect data for Research

Greetings from Uganda Christian University.

I acknowledge receipt of your letter requesting for permission for Mr. Robert Stalone Buwule, a PhD student at the University of Kwazulu-Natal, to collect data from Uganda Christian University (UCU).

Your request is granted on following conditions:

i. that Mr. Buwule should specify the kind of data he wants from UCU before the start of the exercise,
ii. that there is an assurance to share findings and the recommendations of the study with UCU & protect UCU sources if needed,
iii. that the information collected will solely be used for the purposes of this study and not any other purpose to the detriment of the University.

Yours Sincerely,

Rev. Canon Dr. John Senyonyi
Vice Chancellor

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P. O. Box 4, Mukono, Uganda Tel: +256 (0) 31 235 0800/0801 Fax: +256 (0) 41 429 0800 Email: vc@ucu.ac.ug Web: www.ucu.ac.ug

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Uganda Martyrs University

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Office of the Deputy Vice Chancellor Academic Affairs

6th February 2017

Prof. Stephen Mutula
Dean and Head: School of Social Sciences
University of KwaZulu-Natal
Private Bag X01
Scottsville 3209,
South Africa

Dear Prof.,

RE: APPLICATION FOR RESEARCH DATA COLLECTION

Your letter dated 9th November 2016, addressed to the Vice Chancellor was received in my office on 23rd January 2017.

As requested, in principle, it is agreed that the PhD candidate, Mr. Robert Stalone Buwule, carries out his research at Uganda Martyrs University Archbishop Kiwanuka Library. He is however required to submit the following documents for consideration by our research directorate:

1) The research proposal,
2) The survey instruments (questionnaire and interview guide) for our internal reviews.
3) The schedules for data collection/interview to enable us plan with the university officials to be involved accordingly.

Yours sincerely,

M. Mawa

Assoc. Prof. Michael Mawa (PhD)
Deputy Vice Chancellor Academic Affairs

Uganda Martyrs University P.O. Box 5498 – Kampala – Uganda
Tel: (+256) 0382-410611 Fax: (+256)0382-410100 E-mail: dvcaa@umu.ac.ug

KYAMBOGO UNIVERSITY
P.O. BOX 1 KYAMBOGO, KAMPALA-UGANDA
Tel: +256-414- 286238, +256-414-287664
E-mail: vckyu@kyu.ac.ug/www.kyu.ac.ug
Office of the Vice Chancellor

19th December 2016

Prof. Stephen Mutula
Dean and Head
School of Social Sciences
University of KwaZulu-Natal

Dear Prof. Mutula,

APPLICATION FOR RESEARCH DATA COLLECTION

Reference is made to your letter dated 17th November 2016, in which you requested for permission for Mr. Robert Stalone Buwule to collect research data from our University Library.

I wish to inform you that permission has been granted to him, to collect the required data from our University library, within the specified time indicated in your letter (April to October 2017).

We wish him a successful completion of his PhD study.

Yours Sincerely,

OFFICE OF THE VICE CHANCELLOR
20 DEC 2016
KYAMBOGO UNIVERSITY
P. O. BOX 1, KYAMBOGO

Prof. E. Katunguka-Rwakishaya
AG. VICE CHANCELLOR/DVC (AA)

GULU UNIVERSITY

P. O. Box 166
Gulu - Uganda

TEL +256 471 432924
FAX +256 471 432095
Email: ul@gu.ac.ug
URL: www.gu.ac.ug

OFFICE OF THE UNIVERSITY LIBRARIAN

10th January, 2017

Prof. Stephen Mutula
Dean & Head: School of Social Science,
University of KwaZulu-Natal,
Private Bag X01,
Scottville, 3209 Pietermaritzburg,
Republic of South Africa.

Dear Prof Mutula,

REF: APPLICATION FOR RESEARCH DATA COLLECTION

This is to kindly acknowledge receipt of your letter dated 17th November, 2016 and on the above referenced. By copy of this letter, Mr. Robert Stalone Buwule is given permission to collect research data from Gulu University. He is free to contact me before, during and after his data collection exercise for any other assistance.

Yours Sincerely,

Dr. Raphael Aregu, PhD.
University Librarian

Copy: Vice Chancellor, Gulu University
Mr. Robert Stalone Buwule, Doctoral Student, University of KwaZulu-Natal

NDEJJE **UNIVERSITY**

P.O. Box 7088 Kampala Uganda
039-2-730323

Website: www.ndejjeuniversity.ac.ug

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LIBRARY DEPARTMENT

Our Ref: EST/2/14/1

Your Ref:

Date: Jan. 19, 2017

To:
Prof. Stephen Mutula,
Dean and Head: School of Social Sciences
University of Kwazulu – Natal
Private bag x01
SCOTTSVILLE 3209
South Africa.

Dear Professor,

RE: APPLICATION FOR RESEARCH DATA COLLECTION BY MR. ROBERT STALONE BUWULE

We send you warm greetings from Ndejje University.

Reference is made to your letter dated 9 December 2016 in which Mr. Robert Stalone Buwule requested for permission to collect data from our University.

We express our gratitude that he thought of Ndejje University as one of his study area.

We therefore have no objection to this.

He is most welcome.

Yours sincerely,

Dr. Claire Clement Lutaaya Nabutto

For: VICE CHANCELLOR

Copy: Vice chancellor
Copy: Deputy Vice Chancellor
Ndejje University

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

24 July 2017

Mr Robert Stalone Buwule (215081486)
School of Social Sciences
Pietermaritzburg Campus

Dear Mr Buwule,

Protocol reference number: HSS/0573/017D
Project title: Re-Engineering Research and Innovation Information in University Libraries in Uganda for Small and Medium Enterprises (SMEs)

Approval Notification – Expedited Application

In response to your application received on 17 May 2017, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted **FULL APPROVAL.**

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

Dr Shenuka Singh (Chair)

/ms

Cc Supervisor: Professor Stephen Mutula
Cc Academic Leader Research: Professor Maheshvari Naidu
Cc School Administrator: Ms Nancy Mudau

Humanities & Social Sciences Research Ethics Committee
Dr Shenuka Singh (Chair)
Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Telephone: +27 (0) 31 260 3587/8350/4557 **Facsimile:** +27 (0) 31 260 4609 **Email:** xmpaptu@ukzn.ac.za / simonm@ukzn.ac.za / mohunp@ukzn.ac.za
Website: www.ukzn.ac.za

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Founding Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville

Robert S. Buwule
University of Kwazulu Natal
Private Bag X01
Scottsville 3209, South Africa

Dear Respondent,

Informed Consent Letter

Researcher: Robert Stalone Buwule
Institution: University of KwaZulu-Natal Telephone number: +256772371822, +27638994054
Email: 215081486@stu.ukzn.ac.za/burosta@gmail.com

Supervisor: Prof. Stephen Mutula,
University of KwaZulu-Natal, Email: Mutulas@ukzn.ac.za Tel : +27(0)712750109

Please, may I begin by introducing myself. I am Robert Stalone Buwule, a doctoral student in the Information Studies Programme, University of KwaZulu-Natal, South Africa. As part of the requirements towards the fulfilment of my PhD programme, I am required to carry out research. My research study is titled; Re-Engineering Research and Innovation Information in University Libraries in Uganda for Small and Medium Enterprises (SMEs) in the Agricultural Sector.

The study is basically on how University Libraries can restructure Research and Innovation (R&I) information in formats that are easily accessible by SMEs for use in their entrepreneur programs. The purpose of the study therefore is to investigate how University Libraries can systematically create an efficient and effective information management system that can repackage and disseminate research innovations to SMEs. A copy of the instrument is available should you wish to review it in advance. The interview takes 20-30 minutes while the filling of the questionnaire is expected to take about 10-15 minutes.

I am therefore writing to request you to participate in the study. You have been chosen because of the key role you play in the generation, processing and use of R&I Information. There is no foreseeable risk of harm or discomfort that will arise from your participation in this study. The only risk or discomfort will be the inconvenience in terms of time spent during the interview or filling of questionnaire. Please note that participation is purely voluntary and that you may withdraw at any time during the research process with no consequences whatsoever. Your participation will help improve SMEs' innovation and productivity through effective repackaging and dissemination of information on research and innovation.

There will be no monetary gain from participating in this research project. Information provided during interviews will be treated with utmost confidence and only the researchers will have access to the information collected. Your name will not appear in the dissertation,

publications or oral presentations made. Information collected and back-ups of electronic data will be securely stored and be used for research purposes only. After completion of the study, data and information collected will be filed and safely locked up in cabinets for a minimum of five years. Electronic research data will be password protected. Please do not hesitate to contact the researcher 's supervisors or the researcher should you require any additional information or clarification regarding the research. Contact details are provided above.

Alternatively, on any issues pertaining to your rights and participation in the study, please contact the Chairperson, Gulu University Research Ethics Committee, Professor Emilio Ovuga, Tel: No., 0712-220-125; email: emilio.ovuga@gmail.com; or the Uganda National Council for Science and Technology, on plot 6 Kimera road, Ntinda, Kampala on Tel 0414705500.

I look forward to your cooperation.

Yours sincerely

Robert S. Buwule
Doctoral Student

Participant's Consent Statement

Title of the Study: Re-Engineering Research and Innovation Information in University Libraries in Uganda for Small and Medium Enterprises in the Agricultural Sector.

Researcher: Robert Stalone Buwule

I .....of……..... hereby consent to participate in the above study. The researcher has described to me what is going to be done, the risks, the benefits involved and my rights as a participant in this study. I understand that my decision to participate in this study will not affect me in any way. In the use of this information, my identity will be concealed. I am aware that I may withdraw at anytime. I understand that by signing this form, I do not waive any of my legal rights but merely indicate that I have been informed about the research study in which I am voluntarily agreeing to participate. A copy of this form will be provided to me.

Signature of participant……..……Date ……...

Signature of researcher……..……Date……..