DECLARATION

I declare that the work presented in this dissertation entitled “Knowledge Retention at the Natural Resources Development College: an Investigation of Current Practices” is to the best of my knowledge and belief my own work and that it is original. The dissertation contains no material that has been accepted for an award of a degree or diploma by the University of Zambia or any other institution. All the works that are not mine have been duly acknowledged.

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CERTIFICATE OF APPROVAL

This dissertation, by Phales Malekano, is approved in partial fulfilment of the requirement for the award of a Master of Library and Information Science by the University of Zambia.

Examiners' Signatures

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3. Signed……. Date…….…….…….2016

ABSTRACT

This study investigated knowledge retention strategies and practices at the Natural Resources Development College (NRDC). Specifically, the study sought to establish the extent to which knowledge is being retained; identify tools and methods used for knowledge retention; identify the strategies for knowledge retention and establish the challenges of knowledge retention strategies and practices. A Case Study methodology was adopted. A total sample of 102 persons were included in the study sample. Of these, eighty six (86) members of staff were randomly selected. Eighty six (86) questionnaires were distributed and out of these 70 were completed and returned. Sixteen people were interviewed. Data was collected through self administered questionnaires and interview guides. Survey data was evaluated and analysed using the Statistical Package for Social Sciences (SPSS) whilst qualitative data was analysed thematically.

The study established that explicit knowledge was largely retained by staff at NRDC compared to tacit (tacit) knowledge. Paper records and computers were the major tools used for knowledge retention. Major methods used to retain organisational knowledge were documentation and mentoring of new employees. Common knowledge retention strategy was to replace the departing employees, regularly with qualified persons. The study also reveals that NRDC was collaborating with other institutions of higher learning in knowledge management practices through joint research projects and seminars/workshops. Major challenges of knowledge retention at NRDC were retirements, transfers, deaths, secondments and resignations.

Additionaly, NRDC largely produced and retained explicit knowledge compared to tacit knowledge in the form of modules, lecture notes and syllabuses. Furthermore, knowledge retention strategies and practices were present and that tacit knowledge should be retained and stored in form institutional repositories. The college should develop a knowledge retention policy in order to improve the quality of knowledge retention strategies and practices; identify mitigation strategies to address the challenges of knowledge retention such as communities of practice, mentoring programmes, improved internal networks and documentation of work processes and; improve the levels of cooperation with other institutions of higher learning. Further research is needed on knowledge retention strategies and practices in colleges in Zambia.

DEDICATION

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LIST OF ABBREVIATIONS AND ACRONYMS

BLIS	Bachelor of Library and Information Studies/Science
BLOs	Botswana Law Organisations
CUCSA	Council of University of California Staff Assemblies
HLIs	Higher Learning Institutions
ICTs	Information and Communication Technologies
IT	Information Technology
KM	Knowledge Management
MLIS	Masters of Library and Information Studies/Science
NRDC	Natural Resources Development College
PSMD	Public Service Management Division
SADC	Southern Africa Development Community
SECI	Socialisation, Externalisation, Combination and Internalisation
SMEs	Subject Matter Experts
SPSS	Statistical Package for Social Sciences
TDP	Transitional Development Plan
UAE	United Arab Emirates
UNESCWA	United Nations Economic and Social Commission for Western Asia
UNZA	University of Zambia
USA	United States of America

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CHAPTER ONE
INTRODUCTION

1.0 Overview

This chapter introduces the study Knowledge Retention at the Natural Resources Development College: an investigation of current knowledge retention practices. It gives background information and the institutional context on NRDC before presenting the problem under investigation, the rationale, purpose, objectives of the study and research questions through which the objectives are addressed. This is followed by the theoretical framework for the study. The chapter then ends by defining the scope of the study, outlining some of the limitations and providing a summary of the issues dealt within the chapter.

1.1 Background

Knowledge management is a discipline that seeks to improve the performance of individuals and organisations by maintaining and leveraging the present and future value of knowledge assets (Newman and Conrad, 1999). Knowledge management is critical in ensuring sustainability at any higher institution of learning such as the Natural Resources Development College in Lusaka, Zambia. On the other hand, Knowledge retention is an activity directed at retaining and making available valuable knowledge necessary for sustaining operations efficiently and effectively. Therefore, it is critical that a college such as NRDC must focus on retaining its institutional knowledge that is both tacit and explicit.

Knowledge is the full utilisation of information and data, coupled with the potential of people's skills, competencies, ideas, intuitions, commitments and motivations. In today's economy knowledge is people, money leverage, learning, flexibility, power and competitive advantage. Knowledge is more relevant to sustained business than capital, labour or land. Nevertheless, it remains the most neglected asset. It is more than justified true belief and is essential for action, performance and adaption. All in all, knowledge provides the ability to respond to novel situations (Kull, 2005).

A holistic view considers knowledge to be present in ideas, judgments, talents, root causes, relationships, perspectives and concepts. Knowledge is stored in the individual brain or encoded in organisational processes, documents, products, services, facilities and systems. Furthermore, organisation knowledge refers to the total knowledge that the firm has accumulated over time through systems, routines and activities. Knowledge must be looked at as a resource and competence and can lead to strategic capability (Carlsson, 2008).

There are two types of knowledge, explicit and tacit knowledge. Explicit knowledge is the knowledge available in print, via records, books and letters; and for competitive advantage, it may not be so critical since it is widely accessible to everyone (Nonaka and Tekeuchi, 1995). Tacit knowledge is the knowledge existing as intellectual property in peoples' or staff heads. This knowledge is very critical for competitive advantage. Usually, this is the knowledge that should be tapped into, shared, come out, and applied strategically to improve the organisation.

It is for this reason that an institution must focus on retaining its knowledge that is both tacit and explicit. If knowledge is not retained the institution will not be able to learn from past experiences and will have to continually reinvent the wheel, unless appropriate knowledge resides within the organisation and is easily accessible to the right people to enable them to do their jobs (Du Plessis, 2004).

Knowledge retention is affected by factors such as retirement, turnover, resignations, retrenchment, employment equity, mergers, acquisitions and globalisation. Furthermore, if organisations do not seriously address the issue of knowledge loss and attrition by implementing a knowledge retention strategy, this could have detrimental effects on their business success and survival (Martins, 2010).

The loss of experienced personnel combined with the influx of young employees may create unprecedented knowledge retention and transfer problems that may threaten an institution's or company's capabilities for operational excellence, growth and innovation (Levy, 2011).

The recognition of knowledge as a strategic organisational resource cannot be over-emphasised (Civil, 2000; Halawi, Aronson and Mc Carthy, 2005; Oitra, 2005; Zack, 1998). Its value in enhancing operational efficiency and effectiveness in organisations can no longer be denied (Choo, 1995; Delong, 2004; Delong, 2005; Edvardsson, 2003; Musana, 2006 and Roos and

Roos, 1997). However, most organisations are faced with the problem of knowledge loss and proactive responses such as knowledge retention and need to implement strategies in retaining both tacit and explicit knowledge (Delong, 2002; Delong, 2004; Performance Agents, 2006).

According to Kidwell and Johnson (2000) and Ai-Hawamdeh (2002) the retention and management of knowledge is of benefit to universities as well as colleges in the following areas:

- Better decision – making capabilities;
- Reduced product development cycle time (for example curriculum development and research);
- Improved academic and administrative services;
- Reduced costs;
- Preservation of corporate memory; and
- Combating staff turnover by facilitating knowledge capture and transfer.

Knowledge retention problems are evident in Africa where brain drain is common (Cohen, 2002; Davlo (2003); Tapsoba (2000); Wadda (2000), Ayuk and Jones (2005), Kubler and Deluca (2006), Mushonga (2005), Oni (2000), Panapress (2001), Seale (2005) and the World Bank (1995) identify the following knowledge retention related problems that affect performance of African universities:

- Brain drain;
- Low levels of new entrants;
- Inability to attract and retain viable staff;
- Aging workforce;
- Inefficient and ineffective operational approaches;
- Shortage of skilled leadership; and
- Lack of management capacity.

Therefore, there is need for institutions to exploit practical, effective retention and transfer processes and tools to minimise business disruptions and accelerate competency development. Higher learning institutions (HLI) have not been exempted from these developments. Higher learning institutions such as colleges and universities also face these challenges of knowledge

loss. The institutions of learning are said to be in the knowledge business because as they carry out their core business of conducting research, teaching and providing public service, by and large, they generate and utilise enormous amounts of knowledge.

1.2 Institutional context

Natural Resources Development College (NRDC) is one of the ten colleges in Zambia under the Ministry of Agriculture (as of 2016). The College campus is located on 304 hectares of land which is sixteen kilometres from the Lusaka city centre on the Great East Road. Since its inception, the College has trained thousands of graduates who today are contributing to the growth of the agricultural sector as senior staff in government, lecturers in colleges; while others are practicing farmers (NRDC, 2007).

The lack of technically trained personnel at the time of independence in 1964 was among the major constraints to rapid growth in the economy of the Republic of Zambia. To ameliorate the situation, a number of programmes were launched at various institutions of learning during the Transitional Development Plan (TDP) period. The Natural Resources Development College, a product of (TDP) started its training programmes in the context of manpower amelioration (NRDC, 2007).

NRDC was established in 1969 under the then Ministry of Agriculture and Rural Development with the objective of offering a Diploma and Certificate in agriculture. The College admitted the first group of students in March 1969 for two year diploma courses and a one year certificate course in Home Economics. After the three initial courses, the college later developed several specialisations such as: General Agriculture, Agriculture Education, and Engineering. General Agriculture was later split into Crop Science Major, Agriculture Business Management Major and Animal Science Major. Engineering was split into Agricultural Engineering and Water Development. The latter subsequently became Water Engineering, whilst Home Economics became Food and Nutrition and was converted into a diploma course. A Fisheries course was also later introduced at Diploma level. The first three year diploma courses started in 1969 (NRDC, 2007).

In 1976 the College was affiliated to the University of Zambia which enabled the University to underwrite the College Diplomas. The institution also offers distance education and learning in conjunction with the University of Zambia, which commenced in 2007 (NRDC, 2010).

The mandate of NRDC includes the following:

- To train middle-level human resource for the agricultural and related sectors;
- To conduct research and offer consultancy services;
- To offer tailor made short courses; and
- To conduct and offer outreach services in agriculture and related fields to communities within the country (immediate surroundings and outlying areas of the country).

Therefore, NRDC exists in order to make a difference by providing quality service in the training of the end-user in agricultural related and natural resource management in Zambia. In addition, the vision of NRDC is to be a formidable agricultural institution with perfect infrastructure, market driven curriculum, motivated and highly qualified staff providing excellent training, consultancy and research to suit its high corporate image.

Its mission is to train high calibre human resources, conduct research and consultancy and undertake business ventures in order to promote agricultural development that will ensure food production, wealth creation and proper natural resources management responsive to the needs of the local and international communities. Furthermore, the goal of the institution is to significantly contribute to the country's Agriculture Production and related disciplines through training of high calibre human resources and conduct applied research and consultancy in agriculture and related disciplines (NRDC, 2013).

Natural Resources Development College shares similar knowledge retention concerns with other African Colleges; however, the institution has a unique situation involving staff being employed on two conditions of service. One is the Permanent and Pensionable Conditions of service while the other is Part Time Basis (NRDC, 2012). These conditions have implications on knowledge retention based on the following assertions: permanent and pensionable staffs have operational relevant institutional knowledge. Part time staff are assets for continuity who require integration and nurturing in college operations and after working for some time become fully knowledgeable

of college operations. This study therefore seeks to investigate the knowledge retention practices at NRDC.

1.3 Statement of the problem

The retirement age at NRDC was for many years set at fifty five (55) years as the rest of the country. In 2014, the retirement age was changed to 65 years of age as per Statutory Instrument No 63. (GRZ, 2014). However, the country's retirement age was again changed in 2015 to a more graduated retirement plan as follows: 55 years early retirement, 60 years normal retirement and 65 years late retirement (Kyambalesa, 2016). No study have been done at the Natural Resources Development College investigating knowledge retention practices and strategies. Therefore, there is a knowledge gap on this important aspect; as knowledge retention in an organisation is critical to the survival and effective continuity of any organisation.

1.4 Purpose of the study

The purpose of this study was to investigate knowledge retention practices and strategies at Natural Resources Development College (NRDC). To achieve this, the researcher was guided by the following research objectives:

1.5 Research objectives

1. To identify the type of knowledge being retained at NRDC;
2. To establish the extent to which knowledge is being retained at NRDC;
3. To identify tools and methods used for knowledge retention at NRDC;
4. To identify the strategies for knowledge retention at NRDC; and
5. To establish the challenges of knowledge retention practices at NRDC.

1.6 Research questions

1. What is the type of knowledge being retained at NRDC?
2. What is the extent to which knowledge is being retained at NRDC?
3. What tools and methods are used for knowledge retention at NRDC?
4. What are the strategies used to retain knowledge at NRDC?
5. What are the challenges of knowledge retention practices at NRDC?

1.7 Significance of the study

The research findings are expected to give insights into the current state of knowledge retention practices at NRDC, thereby providing direction for policy improvements. Also the benefits that were anticipated from the findings of the study are viewed to include the determination of both the actual practices and gaps in the knowledge retention activities performed within NRDC. The study is valuable because the findings could be used by NRDC to develop effective and efficient programmes that could enhance knowledge retention at the institution. The findings of this study would also add to the existing literature for future research in the field of knowledge retention practices, in the Zambian context.

1.8 Theoretical framework

1.8.1 The theory of organisational knowledge conversion

This study is anchored on Nonaka and Takeuchi's (1995) theory of organisational knowledge conversion which views the interaction processes of tacit and explicit knowledge as an essential feature in knowledge management. This theory identifies socialisation, internalisation, externalisation and combination as the four modes of interaction that facilitate knowledge management in an organisation. Conversion of knowledge from one form to another, results in retention of knowledge in the organisational system.

The sharing of knowledge and experiences means that when retirees leave, their knowledge has been retained by new and young employees who remain behind. When tacit knowledge is converted to explicit (externalisation) it means that knowledge has been captured in the organisation system and the knowledge is retained in the documents and databases. Retention of knowledge includes all activities that preserve knowledge and allow it to remain in the system of an organisation. It also includes those activities that maintain the viability of knowledge within the system (Newman and Conrad, 1999). Nonaka and Takeuchi's theory is about how to create organisational knowledge and how to manage organisational knowledge.

Nonaka and Takeuchi (1995) identified tacit and explicit knowledge as the two types of knowledge that interact to produce new knowledge which through these conversions is retained in the organisational system. Tacit knowledge is the personal knowledge which lies within an individual. Such knowledge is difficult to articulate because it is highly personal. Nonaka and

Takeuchi (1995) regard tacit knowledge as the most critical and important source of Japanese organisations' international competitiveness. Tacit knowledge is bound to persons, based on personal experiences, perception and intuition. While tacit knowledge is difficult to articulate, the same cannot be said of explicit knowledge. Explicit knowledge is easy to codify into formal language, mathematical expressions, specifications and manuals and grammatical statements. This form of knowledge is easy to share among employees. It is easy to transfer and exchange. Nonaka and Takeuchi (1995) further argue that United States managers focus on explicit knowledge while Japanese managers on the other hand, focus on tacit knowledge. According to Nonaka and Takeuchi this explains the success of Japanese companies.

As alluded to earlier Nonaka and Takeuchi (1995) argue that when tacit knowledge and explicit knowledge interact with each other they create four modes of knowledge conversion which are socialisation, externalisation, combination and internalisation (SECI). In their view these constitute the engine of the whole knowledge creation and transfer process. The on-going collaborative engagement results in a knowledge dynamic of sharing and creation of knowledge that may be captured and retained in the organisation.

Through social interaction between individuals and organisations, knowledge is created and expanded and this interaction is referred to as knowledge conversion. Harsh (2009) has observed that this theory has been advanced and modified by Nonaka and his associates (Nonaka, 1994; Nonaka and Takeuchi, 1995; Nonaka and Nagata, 2000). Nonaka and Takeuchi (1995: 62) identify four major knowledge conversions referred to above as follows:

a) Tacit to tacit –socialisation

b) Tacit to explicit- externalisation

c) Explicit to explicit-combination

d) Explicit to tacit-internalisation

Below is a description of each type of interaction:

1.8.2 Socialisation

Socialisation describes an environment where individuals or groups of individuals share personal experiences, mental modes, belief, perspectives and tacit knowledge through individual direct interaction (Harsh, 2009; Nold, 2009). During socialisation, individuals share experiences thereby creating tacit knowledge such as mental modes, beliefs and perspectives. According to this model individuals may acquire knowledge through observation, imitation and practice without using language. New employees who may have greater knowledge of ICTs for instances, may also have something to offer. All in all, computer technology makes it possible for the organisational knowledge to be spread across the entire organisation (Nemani, 2010).

1.8.3 Externalisation

According to Nonaka and Takeuchi (1995: 64) "externalisation is a process of articulating tacit knowledge into explicit concepts'' through externalisation, tacit knowledge becomes explicit by taking shapes of metaphors, analogies, concepts, hypotheses or models." Externalisation describes a process whereby tacit knowledge is converted into a form that is capable of being transmitted to others, outside of the immediate group through creation of procedures, emails and any other forms of media that transmit knowledge to the wider sphere (Nold, 2009).

In this study externalisation aspect may be reflected in paper form. This implies that tacit knowledge is externalised into paper records (organisational memory and archival repositories) that are accessed by the employees for use (codification). Examples of externalisation of knowledge may be through speaking to an individual, writing, drawing a diagram, giving a presentation or even conducting a lecture.

1.8.4 Combination

Combination describes a process whereby individuals outside of the immediate sphere of personal contact receive knowledge that has been shared through some common media to combine the shared knowledge with existing tacit knowledge (Nold, 2009). "Combination is a process of systematising concepts into a knowledge system," (Nonaka and Takeuchi, 1995:67).

Different bodies of explicit knowledge are combined. When individuals communicate through various means, they exchange and combine knowledge through documents, meetings, telephone

conversations and computerised communication networks. Externalisation is largely responsible for the knowledge created in schools through education and training.

1.8.5 Internalisation

Internalisation is the process of embodying explicit knowledge into tacit knowledge. Individuals or groups process newly received knowledge with their own tacit knowledge and by merging knowledge from internal and external sources to create an entirely new nugget of knowledge (Nold, 2009). It is closely related to learning by doing. In this study, the library, archives and records may be identified as sources of technical knowledge that was acquired by employees and then used to solve some work related problems. Nonaka and Takeuchi (1995) further argue that experiences through socialisation, externalisation and combination become valuable assets when they are internalised into individuals' tacit knowledge bases in the form of shared mental modes or technical know-how.

Documentation helps individuals internalise their experiences thus enriching their tacit knowledge. Manuals facilitate the transfer of explicit knowledge to other people thus helping them experience the experiences of others indirectly.

Knowledge transfer refers to activities associated with the flow of knowledge from one party to another and these include communication, translation, and conversion, filtering and rendering (Newman and Conrad, 1999). Knowledge transfer and retention occurs when people as members of the same and or different organisations, exchange tacit and explicit knowledge (Jennex, 2007).

These four modes of Nonaka and Takeuchi's Socialisation, Externalisation, Combination and Internalisation (SECI) mode show that knowledge can be transferred from one employee to another, from the heads of employees to documents/databases through knowledge conversion thus retaining knowledge in the organisation system. In short socialisation, externalisation, combination and internalisation activities help organisations to retain knowledge in the organisation.

1.9 Definitions of terms

For the purpose of this study the following key words were used with the following operational meanings:

1.9.1 Information

Information is defined as ideas, facets and imaginative works of mind and data of value potentially useful in decision making, question answering, problem solving, that which reduces uncertainty (Kaniki, 1989).

1.9.2 Information Management

Information management is the capacity to harness the organisation's information resources and information capabilities to energise organisational growth.

Furthermore, information management is the collection and management of information from one or more sources and the distribution of that information to one or more audiences. In short, information management entails acquiring, organising retrieving and maintaining information Choo (1995).

1.9.3 Knowledge

Knowledge is a fluid mix of framed experience, values, contextual information, expert insight and grounded intuition that provides an environment and framework for evaluating and incorporating new experiences and information. Furthermore, knowledge is the boundaries encompassing job related entities (such as operational thoughts, behaviours, standard operating procedures, organisational routines, and competitor and customer knowledge) and individuals' insights and their working experience which is relevant to their current job (Davenport and Prusak, 1998).

1.9.4 Explicit Knowledge

Explicit knowledge refers to knowledge that is learned and is consciously accessible by the holder. It may refer to knowledge that has been learned through explicit instruction or recitation, or to a skill acquired through replication (Tagger, 2005). This knowledge is tangible.

1.9.5 Tacit Knowledge

This is knowledge that is highly personal and hard to formalise, making it difficult to communicate or share with others. Tacit knowledge is deeply rooted in an individual's actions and bodily experience, as well as in the ideals, or emotions that they embrace (Takeuchi and Nonaka, 2004).

1.9.6 Practices

Practice is a way of doing something that is the usual or expected way in a particular organisation or situation. Also, it is a thing that is done regularly, for example, a habit and custom (Hornby, 2000).

1.9.7 Analysis

Analysis is the detailed study or examination of something in order to understand more about it (Hornby, 2000).

1.9.8 Knowledge Acquisition

Knowledge acquisition is defined as the process of extracting, structuring and organising knowledge from human experts so that the problem-solving expertise can be captured and transferred into a computer- readable form (Liou, 1990).

1.9.9 Knowledge Transfer

Bou-Liusar and Segarra-Cipres (2006) define knowledge transfer as the exchange of knowledge between units within a firm (internal transfer) or between different firms (external transfer).

Knowledge transfer is defined as the process through which one unit (e.g. group, department, or division) is affected by the experience of another. They further point out that transfer of organisational knowledge (i. e, routine or best practices) can be observed through changes in the knowledge or performance of recipient units.

As provided above knowledge transfer refers to how knowledge flows in organisations, departments or indeed sections and units. Such knowledge flows may entail interactions of individuals or indeed an individual making reference to codified knowledge.

1.9.10 Knowledge Repository

Knowledge repository is defined as the storage place for the knowledge collected in the institution.

1.9.11 Knowledge Retention

Knowledge retention refers to all systems and activities that preserve knowledge and allow it to remain in the system once introduced. It includes all activities that maintain the viability of knowledge within the system (Newman and Conrad, 1999).

Knowledge retention is a subset of knowledge management and is a process whereby an organisation uses its collective intelligence to accomplish its objectives by managing the social, cultural, and technological environment where information, expertise and insight converge and learning from others through systematic, enterprise-wide approaches, exploiting ways to share and re-use existing knowledge, exploring ways to recombine knowledge to discover best practices and innovate better practices and transforming knowledge among tacit and explicit forms (Kull, 2005).

Based on the above definitions, knowledge retention can be defined as an activity directed at retaining and making available valuable knowledge necessary for sustaining an organisation's operations efficiently and effectively. It also serves as a mechanism for reducing errors, inefficiencies, redundancies, re-inventions and minimising costs associated with knowledge loss. Knowledge retention includes all activities that preserve knowledge and allow it to remain in the system once introduced.

1.9.12 Knowledge Management

Knowledge Management is a capability pertaining to knowledge creation, organisation, storage and retrieval, knowledge transfer, and knowledge application which enhances a firm's ability to gain and sustain a competitive advantage (Carlsson, 2008). Knowledge management is the collection of processes that govern the creation, dissemination and utilisation of knowledge. Also knowledge management is the systematic leveraging of information and expertise to improve organisational and operational innovation, responsiveness, productivity and competency.

1.9.13 Information and communication Technologies

Information and Communication Technologies are generally regarded as technologies that support an individual's ability to manage and communicate information electronically, and include hardware such as computers, printers, scanners, video recorders, television, radio and digital cameras as well as the software and systems needed for communication, such as the internet and email (Bialobrezeske and Cohen, 2003).

1.10 Structure of the Dissertation

This dissertation comprises six chapters. The first chapter introduces the study by providing background information on the investigation, stating the specific problem under investigation

and giving the rationale for the study. The chapter also outlines the aim and objectives of the study, the specific research questions addressed as well as the theoretical framework for the study. The second chapter reviews some of the available literature that is considered to be of direct relevance to the present study in order to place the investigation within the context of similar studies thereby enriching it as well as providing a justification for it.

The third chapter describes in detail the methodology used to collect data in order to provide answers to the questions raised in chapter one of the study. The chapter builds on the introduction and presents details relating to the type of research design employed in the study, the study area, sample size, the data collection instruments and procedures, as well as data analysis processes that were used to interpret the results. The fourth chapter presents the findings from the data collected on knowledge retention at Natural Resource Development College (NRDC). The presentation is arranged according to the research objectives and questions as set out in chapter one.

The fifth chapter presents a discussion of the findings regarding knowledge retention practices at NRDC. Sixth chapter draws conclusions based on the findings and makes recommendations with regard to policy formulation and areas requiring further research. This is followed by the Reference section. This is a list of sources consulted and referred to in the dissertation. The sources are arranged alphabetically by author using the Harvard citation format. The reference section is then followed by appendices, which have been referred to in the dissertation. The appendices are included here for further clarity.

1.11 Summary of Chapter One

This chapter has introduced the investigation of the existence of knowledge retention practices at NRDC. The chapter also gave the introduction; background information on NRDC, there after presented the problem under investigation, the rationale, purpose and objectives of the study, as well as the specific objectives through which the objectives are addressed.

The next chapter presents a review of literature relevant to this study in order to place the investigation within the context of similar surveys. It also provides the theoretical and conceptual framework for the study.

CHAPTER TWO
LITERATURE REVIEW

2.0 Overview

This chapter presents the literature review. The purpose of literature review was to find out other studies that have been done on knowledge retention practices and strategies in other organisations. The literature was purposefully searched and selected on the basis of relevance to the current research topic of knowledge retention practices and strategies.

2.1 Knowledge

In the beginning there was land, labour and capital for business sustenance (Hans-Dieter, 2002; Hoffman, 2005). Then the importance of information came along (Symonns, 2004). Thereafter, knowledge (Mohrman and Finegold, 2000). From time immemorial, knowledge has been an input in every organisational process. However, what has been lacking was a formal recognition of ways to explicitly manage knowledge as a resource (United Nations Economic and Social Commission for Western Asia, 2003).

Furthermore, Mohrman and Finegold (2000) state that in today's highly charged competitive environment, companies have to make their knowledge count. They cannot afford to recreate the same knowledge over and over in different parts of the organisation. They have to link their employees to the best knowledge available and then apply their talents to generate and use knowledge in ways that keep the company out in front. This is very true for learning institutions where most of the functions performed are knowledge – intensive as opposed to physical strength (Dewe and Wright, 2007; and Tippins, 2003: 339).

2.2 Types of knowledge retained in organisations

There are two main broad categories of knowledge, namely, tacit and explicit (Tagger, 2005; Nonaka and Takeuchi, 1995). This broad categorisation of knowledge also forms the basis upon which most organisations introduce knowledge management programmes (Gordon, 2000).

2.2.1 Explicit Knowledge

Explicit knowledge is that knowledge contained in an organisation's documents such as procedures manual, policies, code of conduct, annual reports, records and archives. This type of knowledge is easy to share, unlike tacit knowledge. Also according to Nonaka and Takeuchi (1995) explicit knowledge can be expressed in words and numbers as well as easily communicated and shared in the form of data, scientific formulae, codified procedures, or universal principles." In this regard, Nonaka and Takeuchi, (1995) point out that explicit knowledge can easily be processed by a computer, transmitted electronically or stored in databases.

2.2.2 Tacit Knowledge

Tacit knowledge is that one which resides in the minds, cultures and experiences within the organisations (Rowley, 2003). Tacit knowledge is defined as one's personal, internal or interior knowledge (Irick, 2007) and is deeply rooted in individual experiences, ideas values and emotions (Gourlay, 2002). Tacit knowledge is hard to put into words (Jain, 2009) because it is highly personal and hard to communicate or share with others (Koskinen, Pihlanto and Vanharanta, 2003) but it is important because expertise rests on it thus making it a source of competitive advantage. Luen and Ai-Hawamdeh (2002) view tacit knowledge as possessed by individuals and communities and it can be optimised through the creation of communities of practice that can hold, share and grow tacit knowledge. This is in line with Baumard (1999), who contends that tacit knowledge could be an attribute of both individuals and of groups (Irick, 2007). Tacit knowledge could be achieved during socialisation, face-to-face meetings, teleconferencing and electronic discussion forms (Jain, 2009). Nonaka and Takeuchi (1995) also think that tacit knowledge can be transmitted through social interactions of individuals. According to Nonaka and Tekeuchi (1995), tacit knowledge can be gathered by socialising, that is using face-to face communication or better, sharing experience directly at work through two roles: the tutor and the apprentice. Through a process of dialogue, discussion, experience sharing and observation, such knowledge is amplified at the group and organisational levels (Nonaka and Takeuchi, 1995). They further argue that in this way there will be little risk that the know-how of your company leaves at the same time as an employee's retirement.

This view suggests that socialisation can be utilised to retain organisational tacit knowledge that is possessed by experts and experienced individuals in the organisation.

Explicit knowledge is codified knowledge while tacit is personalised knowledge (April and Izad, 2004). Furthermore, literature proves that there is agreement among researchers that tacit knowledge is the most important type of knowledge that exists in an organisation. Tacit and explicit knowledge have a symbiotic relationship whereby tacit knowledge contributes to explicit and vice versa (Srikantaiah, 2001).

Organisations that approach knowledge management with a view to manage explicit knowledge in most cases adopt Information Technology (IT) to drive the programme. On the other hand, those that focus on managing tacit knowledge, use social interaction mechanisms to ensure the transfer of knowledge among employees. However, other organisations possess integrated approaches where both tacit and explicit knowledge are managed, (North and Hornony, 2003).

2.3 Tools and methods used for knowledge retention

The need to manage organisational knowledge has emerged, many knowledge retention methodologies have been proposed and implemented (Ohion, 2006). However, for this research and as a way of retaining College knowledge, knowledge acquisition, knowledge assessment and knowledge transfer are considered as critical components that need integration for a successful organisational knowledge retention programme. This is in line with (Delong, 2004) Knowledge Retention Strategy.

2.3.1 Knowledge Acquisition

The study of knowledge acquisition in organisations has in most cases been associated with organisational problem solving and work performance or indeed operational/process enhancements (Cheah 2003; Mc Call 2006; Poulymemakou Cornford and Whitley 1990; Soo Midgley and Devinney 2002). Based on the above consideration, it is safe to argue that not only is knowledge acquisition a vital requisite in organisational problem solving, but it is equally important for sustaining organisational operations.

In fact, Lyles and Salk (2006) empirically established the existence of a positive relationship between knowledge acquisition and organisational performance visa-a-vie business performance and building employee competencies.

As outlined by Wilson (1989), there are many techniques for knowledge acquisition in organisations. Therefore, recruitment as well as training and development are some of the many knowledge acquisition practices.

2.3.2 Knowledge Transfer

Knowledge transfer is another interrelated dimension of knowledge retention, besides knowledge assessment and knowledge acquisition. Furthermore, knowledge transfer is about providing and obtaining knowledge (Willkesmann, Wllkesmann and Virgillito, 2007). Such an understanding of knowledge transfer presupposes the existence of a link between knowledge acquisition and knowledge transfer. Antal (2003) stresses that once knowledge has been acquired, it must be distributed. If the knowledge remains with the unit or individuals who obtained it, it is of little use to the organisation. For Fadel (2005) knowledge transfer is the application of acquired knowledge to work situations.

With intention to retain university knowledge, the Council of University of California staff assemblies (CUCSA) workforce evolution work group stated that a successful knowledge transfer programme must include:

- Identification of critical knowledge to retain key personnel to engage;
- Selection of knowledge transfer method and support for success;
- Recognition of contributions and accomplishments; and
- Assessment and refinement of methods based upon defined measures (University of California, 2006).

There are various methods that organisations utilise to capture and retain organisational knowledge. In a study by Dewah (2012), it was established that documentation processes was the most common method of retaining organisational knowledge. Furthermore, the findings from the study indicated that knowledge was retained and stored in organisational servers, archives, audiotapes, videotapes and databases. Also the knowledge was kept in the archival repositories

and organisational libraries for use by staff. Overall, the results indicated that paper-based records were the most important knowledge preservation media in the broadcasting organisation.

2.4 Knowledge Retention

There is no doubt that knowledge retention is one of the facets of knowledge management; taking centre stage in the knowledge economy brought about by the problem of knowledge loss that cuts across all industries (Delong, 2004; IBM Consulting Services, 2003). However, institutions of higher learning and organisations should realise that in the absence of knowledge retention and management practices, they stand to lose their organisational memory, that is, the operational knowledge within employees as well as the organisational operating procedures and related documents (Kruse, 2003).

Knowledge retention refers to all systems and activities that capture and preserve knowledge and allow it to remain in the organisational system once introduced. It includes all activities that maintain the viability of knowledge within the system (Newman and Conrad, 1999). As for Kim (2005), knowledge retention is the capture of knowledge and expertise from employees before they leave an organisation. In situations where members of staff such as lecturers decide to leave the organisation, knowledge retention ensures continuity of knowledge. Knowledge, expertise and skills are found in organisational employees' heads. Therefore, when such people leave, the knowledge is lost unless there are measures put in place to capture, preserve and transfer it. In this regard, knowledge retention is used to develop appropriate approaches for capturing the extensive knowledge of experts who are ready to retire and retaining it as organisational knowledge (Kim, 2000).

In the same vein, Shaw and Williams (2009) argue that the retention of knowledge for knowledgeable employees is a critical economic resource and a core element to achieve significant competitive advantage. As for Walsh and Ungson (1991), the contexts of knowledge retention within an organisation include individuals, structures, organisational culture and the physical structure of the workplace. Knowledge has appeared as the most strategically important resource for companies (Grant, 1996) and therefore losing it would affect organisational performance. Organisations that fail to manage knowledge are likely to be at a disadvantage

when employees with tacit knowledge move to another organisation in response to incentives, or when such employees retire or die.

According to Johnston (2005), the challenges of knowledge retention are being driven by two forces that are shaping today's workforce, namely an aging population and the increasing complexity of knowledge needed in technologically advanced societies. These two forces together cause an acute skills shortage.

In a study carried out by Levy (2011) in Israel involving eight organisations with more than thirty retirees, knowledge retention mini projects, found that successful knowledge retention can be achieved through documenting, integrating knowledge back into the organisation but special care being dedicated to retaining best practices

Studies that investigate knowledge retention in the SADC countries appear to be on the increase (Phaladi, 2011; Wamundila and Ngulube, 2011). Phaladi (2011) conducted a study on knowledge transfer and retention: the case of public water utility in South Africa. The major objective of the study focused on knowledge management retention strategies that can be put in place to address the potential lost knowledge. The experts interviewed expressed the view that organisational culture was not futile for knowledge transfer and retention. Organisational culture reflects the norms and beliefs that guide the behaviour of an organisation's employees. It is a critical enabler of knowledge transfer and retention endeavour. There seemed, however, to be a lack of motivation on the part of the source of knowledge. It had been indicated that the reluctance to transfer knowledge was largely due to individuals that were afraid that once their knowledge had been transferred, it would threaten or lessen their ability to do their jobs. For whatever reason, some people felt that power came from accumulating and hoarding knowledge for themselves.

Further, many knowledge experts also felt that employees were not motivated by the management and the leadership of the organisation and to share knowledge. Based on the information collected from respondents, there seemed to be a serious lack of management support and commitment at the highest level of the organisation.

In its conclusion, the study established that there is a strong correlation between organisational culture and management support that an organised culture and structure that supports learning as

well as the sharing, storage and use of knowledge go a long way towards cultivating a culture of knowledge and retention. There was also a feeling amongst experts that the current organisational culture was not supportive of knowledge transfer and retention activities.

The culture of the public water utility rewarded individual performance and targets over team performance, as a result, employees competed with each other, and in so doing, they were keeping information and knowledge from their colleagues. To some extent, this could be blamed for hindering culture of knowledge sharing and transfer. Where there was a chance of knowledge sharing, it was limited to workplace meetings and was done in a silo-oriented manner.

Wamundila and Ngulube, (2011) conducted a case study of the University of Zambia whose title was enhancing knowledge retention in higher education.

The aim of the study was to investigate how knowledge retention may be enhanced at the University of Zambia (UNZA). The findings of the study showed that there was paucity of documented processes, policies, work manuals and procedures at UNZA. The findings suggested that UNZA hardly knows its operational capability because of the limited documentation available on how work was carried out in the various operations of the institution. The implication of this situation was that there was no mechanism that was put in place to provide a platform on which operational knowledge within UNZA could be acquired. The findings with regard to these techniques were not positive. It was clear that very few work processes and tasks were documented. Workforce planning was not practiced and skills as well as competency inventories were lacking.

It has been argued that organisations need to document and retain the knowledge of their key personnel and subject matter experts, manage this intellectual capital before it simply walks out of the door resulting in organisations losing valuable intellectual capital, namely knowledge, talent, experience and expertise (Hernandez, 2006). In the same vein, Kelleher (2006) argues that even if organisations were to recruit new employees they could not replace the experiences or the knowledge of retirees. In this regard, this knowledge has to be captured and stored in organisations' repositories such as databases, documents, software and embedding it in processes, products and services thus transferring the existing knowledge around in the organisation.

2.4.1 Information and Communication Technology and Knowledge Retention

The knowledge-based view focuses on the organisation's ability to gather, produce, maintain and disseminate knowledge. Information and Communication Technologies (ICTs) are impacting heavily on the way organisations function and play a vital role in the knowledge society. Communications up and down, from one department to another, from manager to manager can be enhanced and increased by using technology. In this way the lines of communication are made shorter, clearer and more concise. ICTs make it possible for connections that enable knowledge transfer, sharing and retention in organisations (Carlsson, 2008).

ICTs are electronic means of capturing, processing, storing, and communicating information. These ICTs include digital information, computer hardware, software and networks and analogue based information such as radio, television and telephone (Kiplang'at and Ocholla, 2005). The knowledge generated is captured and made accessible to others through IT systems (Holbeche (2005). Technology tools such as collaborative computing tools, knowledge servers, enterprise knowledge portals, electronic document management systems, knowledge harvesting tools and search engines that support knowledge management are called knowware (Turban, Mclean and Wetherbe, 2004).

In this regard, information technology is a powerful facilitator and necessary enabler for effective knowledge management activities such as capturing, sharing, and integrating knowledge (Albers, 2009; Jain, 2009; Sahasrabudhe, 2001:270). Contrary to previous perceptions that technology was key to success, the corporate world now realises that the effectiveness of enterprises lies in the people's knowledge, intellectual capital and expertise (Wig, 2004). Therefore, effective knowledge management practice could be achieved by utilising latest information technology in order to capture, create, store, transfer, share, and display, evaluate, maintain and update knowledge (Jain, 2009).

Daka (2010) conducted a study on the knowledge sharing culture among academicians in higher learning institutions in Zambia. The aim of the study was to investigate the knowledge sharing culture among academicians in higher learning institutions in Zambia.

The findings of the research indicated that the concept of knowledge sharing is well understood among academicians in Higher Learning Institutions (HLIs) in Zambia. Nearly 90% of those

surveyed indicated that they were familiar with the term "Knowledge sharing." Furthermore, their descriptions of the concept indicated that they did consider knowledge to be of some value to them and to those around them. Further, it was found that most academicians in Higher Learning Institutions in Zambia were engaged in knowledge sharing activities. The findings of the research clearly showed that more than 90% of the surveyed academicians frequently exchanged knowledge with colleagues within their field of specialisations, while more than 80% engaged in frequent knowledge sharing outside their fields of specialisation. This was an indication that was a culture of knowledge sharing among academicians Higher Learning Institutions in Zambia exists. This was evidenced by high awareness and participation in frequent knowledge sharing exchanges, both within and outside academicians' fields of specialisation. It was also clear that whilst many opportunities to share existed within HLIs, academicians preferred platforms such as those that involved higher interactivity, for example, meetings and person to person interactions where openness and shared norms were key. Additionally, the frequent use of new technologies highlighted academicians' potential to share their knowledge across the traditional restraints of time and space.

2.5 Knowledge Retention Strategies

Knowledge is lost through retirement and movement of people but this loss can be overcome by documenting previous processes and procedures. To retain important information and knowledge has remained the main challenge and strategic goal for organisations (April and lzad, 2004). Knowledge can be retained in organisation through various strategies that may involve education, training, establishing communities of practice and professional networks, documenting the processes and use of advanced software to capture work processes (Wamundila and Ngulube, 2011; April and Izad, 2004; Vinson, 2003; Thomas, 2008; Lahaie, 2005).

Vinson (2003) states that when discussing knowledge retention the primary concern is how to tap the brains of employees who are retiring and moving on to new jobs or otherwise leaving the company.

He adds that knowledge sharing (ideas, best practices) and working with lessons learned but ignores other strategies such as communities of practice, archiving knowledge, mentoring, coaching and so forth. Holtshouse (2009) is of the view that education and training of the replacement of employees are the top knowledge retention strategies for younger workers (25

years or younger) who leave the organisation. However, valuable organisational know-how might be captured using resources such as communities of practice, professional networks, documentation processes and work processes knowledge capture through advanced software. Therefore, managers in organisations can in some way encourage the creation and establishment of resources such as communities of practice and professional networks to encourage the capture and retention of personalised tacit knowledge that is found in individuals.

Knowledge retention strategies can keep employees' workplace-acquired wisdom from walking out the door when they retire (Thilmany, 2008). In this regard, organisations need to establish ways to retain employee's know-how and best practices so that the knowledge could be passed on to future workers and replacements made on who should regain the on-the-job knowledge the ex-employees spent years accumulating (Thilmany, 2008). Knowledge retention strategies depend on the efficient use of a wide range of people management techniques and organisational storage media, both electronic and otherwise (April and Izad, 2004). Therefore, the impact of attrition can be reduced by making use of appropriate knowledge retention approaches to capture knowledge and information in organisations.

Vinson (2003) and Holtshouse (2009) mention communities of practice as some of the knowledge retention strategies that can be used in organisations. Communities of practice have been defined as voluntary groups of people held together by a common sense of purpose, who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in a particular area of concern by interacting on an on-going basis with a real need to know what each other knows (Skyrme, 1997; Kim, Lee and Oslon, 2008; Albers, 2009). Such people have a common sense of purpose and common interests; they share work-related knowledge and experience and engage in a collective process of learning (Jain 2009). In order to retain knowledge, organisations rely on Communities of Practice for the purposes of identifying, capturing, and transferring knowledge. Communities of practice share experiences and insights but the people are not a formal team.

Communities of practice working on company projects and initiatives share both tacit and explicit knowledge by taking information and materials and refining them to a point where they can become corporate positions on topics.

As for Lamonica (2001); Nonaka (1997) and APQC (2011), mentoring and apprenticeship programmes can be used as a strategy of transferring tacit knowledge from an experienced employee (subject matter expert) to a more junior employee. Mentorship entails the pairing of an experienced member of staff with a new employee in order to assist the new employee acquire new knowledge and skills to operate (Beazley, Boenisch and Harden, 2002).

Mentoring and tutoring techniques enable senior employees to transfer their knowledge, wisdom, specific insights and skills to their juniors within a short space of time such that when the experienced employees leave the organisations or die the organisation's substantive practice, knowledge, history, stories and culture are preserved (Rusanow, 2004; Dubin, 2005). Mentors gently transfer subtle, private skills and experiences to others as role-models thus introducing mentors to their network in an informal setting. Subject matter experts (SMEs) are paired with individuals who have interest and therefore need further training and development in a subject matter area (APQC, 2011).

Subject Matter Experts demonstrate mastery of particular topics or jobs and play a key role in knowledge management in organisations because of their ability to answer questions, provide historical perspective, and offer solutions and so on (APQC, 2011). Effective succession planning of experts is also desirable to encourage retention of knowledge and expertise (Debowski, 2006). In some organisation, Subject Matter Experts (SMEs) are assigned duties of mentorship and apprenticeship, identifying core knowledge for their communities, answering questions, and as instructors; teaching internal courses (APQC, 2011).

The other powerful knowledge retention and transfer strategy is the story telling practice which has the potential to personalise an issue by bringing it alive for listeners or readers (APQC, 2011). Storytellers in an organisation maintain cohesion and provide guidelines for the people to follow (Holbeche, 2005). Stories are effective in bridging generational gaps, communicate vital information about an organisation's culture, and helps employees develop a sense of organisational identity (APQC, 2011; Holbeche, 2005). Therefore, storytelling may be used to capture successes, lessons learned and other knowledge explicitly. Stories are instrumental for knowledge sharing and collaboration.

2.6 Challenges of knowledge retention

Most organisations are faced with attrition challenges comprising of retirements, resignations, deaths and general movement of a young workforce, generally referred to as employee mobility and turnover. These challenges (retirements, resignations, deaths) have been identified as agents for knowledge loss, which cause inability to perform organisational operations efficiently and effectively.

When people resign from their job in one organisation to another the consequence of that mobility is turnover. Equally when an employee leaves an organisation either through death or retirement. This turnover becomes an issue when the leaving employee is a higher performer whose replacement would be a challenge (Stovel and Bontis, 2002).

Most of the concerns that have been raised regarding the aging workforce involve the loss of knowledge as a result of the retirement of baby boomers, and the potential shortage of workers to fill the gaps that exist in the workforce. Many of these retiring employees have amassed great knowledge, skills and wisdom, which have not been personally transferred to other individuals within the organisation (Thomas, 2008).

The departing employees take many kinds of knowledge with them such as subject-matter expertise and organisational memory of which certain key decisions were made and awareness of past company projects (Parise, Cross and Davenport, 2006).

Kruse (2003) and Scalzo (2006) argue that the loss of organisational knowledge is a menace for operational efficiency and effectiveness. Such a menace emanates from the understanding that from inception, an organisation acquires its operational knowledge "relevant for its existence'' (Scalzo, 2006). However, if such knowledge is not managed and retained, an organisation stands to lose the knowledge acquired along the way, a threat that has been viewed to have detrimental effects on organisational operations (Lahaie, 2005).

According to Delong (2004) and Padilla (2006) and Stovel and Bontis (2002), the main notable knowledge loss drivers that have been identified and that necessitate the need to retain organisational knowledge are as follows:

- Changing workforce demographics and profiles;

- Employee turnover and mobility; and
- Lack of knowledge documentation.

In other words, when employees leave, they depart with more than what they know, they also leave with critical knowledge about who they know.

Studies have repeatedly demonstrated that such relationships are crucial sources of information and performance in organisations.

The fact remains that an employee who has been with the institution for 15 years or more cannot simply be replaced by another individual, even someone with very similar skills, without resulting in disruptions in the web of formal and informal relationships that get the job done (Parise, Cross and Davenport, 2006). Co-workers require time to understand a new person's true expertise and determine when to seek out that individual. Building up such experience and network is not an overnight process, but rather a continuous and lengthy one.

In the current knowledge economy, managers and knowledge workers work in a rapidly evolving technical and scientific environment. They gain experiential knowledge, only some of which is formally captured and shared. Inevitably, many are leaving without passing on valuable knowledge, experience and expertise. In many instances, successors only discover that they are missing key information through mistakes, unexpected quality defects or major costly disruptions. Therefore, for most institutions, such costly, unexpected disruptions or mistakes cannot be tolerated. These knowledge gaps can be difficult to pinpoint and diagnose because the work processes of today are very complex.

Delong (2004) points out that managers cannot afford to lose knowledge if they expect not only to sustain their current performance levels, but to also improve performance levels through innovation and growth. Business strategists, managers and leaders must therefore urgently address the issue of knowledge retention, which threatens to undermine the evolution of the knowledge economy.

According to Skyrme (2008), culture stands out as the key factor that determines the success and the failure of knowledge transfer and management. The findings of the study mentioned factors such as fear, lack of incentives, motivation, turf protection, culture of resistance, too much

change, and lack of leadership and management support were considered to be negative factors in the knowledge transfer culture within the public water utility. Such a culture was not considered to be attractive to the younger generation of engineers, scientists and technicians. Therefore, this culture only served as a barrier to potential knowledge sharing behaviours and attitudes within the organisation.

2.7 Knowledge Loss

The Reader's Digest Oxford complete wordfinder (1993:904) defines the word "lose" (past tense "lost") as follows: to "be deprived of or cease to have, especially by negligence or misadventure". In organisational terms, lost knowledge could mean that the organisation ceases to have the knowledge that "walked out the door" owing to the misadventure of people leaving and their valuable knowledge not being retained by the organisation. This loss of knowledge could lead to attrition, that is, a reduction in or decrease of valuable knowledge in the organisation (Roget's international thesaurus 1988:40).

In organisations, individuals and groups use knowledge to solve problems, make decisions and perform actions. Knowledge is applied in all these situations (Alavi and Tiwana 2003:111). Lost knowledge would then mean a decrease in the capacity to solve problems, make decisions and perform effective actions (Delong 2004:21). Lost knowledge could have an effect at organisational, group and individual level. The following are examples:

Organisation level. The South African Air force is one example where erosion of knowledgeable people has been taking place on a large scale. In 2007, 82% of resignations were on the non-commissioned officer level of whom more than half were from the technical division (Gibson 2008:8). This implies great loss of knowledge at a supervisory technical level.

Group level. A design team with experience in repeatedly developing new products leaves the organisation before transferring their knowledge to inexperienced employees, thus exposing the organisation to the risk of losing critical knowledge.

Individual level. At individual level, knowledge could be lost when a highly experienced individual retires and the people who remain in that particular section do not have the knowledge and experience to solve difficult problems- for example, a mechanical engineer who,

owing to years of personal experience, knows how to search for a fault and rectify it (Delong 2004:143).

2.8 Consequences of knowledge Loss

The challenge facing many organisations, both private and public, is not only the loss of some of their most experienced employees, but also the fact that many of these knowledge workers and managers are taking with them new types of critical expertise and experiential knowledge that did not exist a generation ago. In the new economy, organisations are facing not only a labour shortage, but also a knowledge shortage. As for Delong (2004) and Johnston (2005), the problem for management is not only one of a headcount; it is a question of retaining sophisticated, context-dependent knowledge that resides with an employee who is leaving.

Recognising that the lost knowledge can be a threat to organisational performance is the first important step in knowledge retention. The design and implementation of effective knowledge transfer and retention strategies will require managers to understand the forms and types of lost knowledge and how they affect the organisation. Focusing on the threat of lost knowledge, instead of staffing shortages will provide managers with more accurate perspective on the impact of turnover on the knowledge economy. The old adage "Knowledge is power" becomes critical in this case because knowledge is the economic engine for any business to run efficiently and effectively. Lost knowledge, broadly defined, means the decreased capacity for effective action or decision making in a specific organisational context (Johnston, 2005).

The hidden or unanticipated costs of lost knowledge through retirements or any attrition are becoming a huge drain on organisational productivity and in some cases, a threat to sustaining competitive advantage. In the long-term, organisations cannot compete effectively in the knowledge economy unless they are serious about knowledge retention. The best approach is to look at the impact of lost knowledge when employees retire in order to develop strategies to effectively manage knowledge.

Delong (2004:31) indicates that the problem of lost knowledge has four dimensions that business leaders need to understand, namely:

- It can occur at the individual, group or organisational level;
- It can have either anticipated or unanticipated effects;

- It can have tangible or intangible effects; and
- It can create immediate or delayed costs.

Different lost knowledge scenarios call for different solutions. Accordingly, recognising that lost knowledge through impending retirements may be a threat to business performance is a critical first step in a addressing this phenomenon. According to Delong (2004), lost knowledge can have an impact on organisational strategy and performance in five main ways, namely:

- Reduced capacity to innovate;
- Ability to pursue growth strategies is threatened;
- Reduced efficiency undermines low-cost strategies;
- Losing knowledge can give competitors an advantage;
- Losing certain knowledge at the wrong time increases vulnerability.

Therefore, organisations need to identify these situations ahead of time as this would assist them in focusing and aligning their knowledge retention initiatives, which would have the greatest impact on long-term business performance and sustainability.

Senior management in organisations need to start thinking strategically about the threats and opportunities posed by retiring employees, and formulate strategies to respond to this phenomenon.

Research indicates that within the African universities, the loss of knowledge is evident in brain drain (Mushonga 2005; Ohion 2006). The study conducted by Mushonga (2005) at the University of Zimbabwe showed that the situation was not different from other African Universities. The study indicated that vacancy rates in Zimbabwe's state universities range between 50% and 70% with those leaving the universities citing among other reasons low remuneration packages. The finding of the study indicates that the situation in Zimbabwe's universities applies to most African universities. According to Mushonga (2005), if no measures to curb the scourge of brain drain are put in place, the result would be continued declines in academic standards, dwindling research output and perpetuated staff attritions. Similarly, while writing on brain drain in Nigerian universities, Oni (2000) contends that African Universities are

losing their capacity to build African economies and institutions due to brain drain; the loss of tacit knowledge.

2.9 Summary of Chapter Two

This chapter presented a review of relevant literature to the study. The findings by previous researchers have been highlighted and a number of questions requiring further consideration were raised.

To conclude on literature review, there is not a lot of referred published material on the subject of knowledge retention and education in general in Zambia. Research studies on knowledge retention in Africa not to mention Zambia is still scanty as little research known has been undertaken on knowledge retention in higher learning institutions. This study therefore bridges the gap by investigating knowledge retention practices at Natural Resources Development College (NRDC).

CHAPTER THREE
RESEARCH METHODOLOGY

3.0 Overview

The aim of this chapter was to describe the methodology that was selected and used in the study. The methodology includes the research design, the target population, sampling techniques, the sample size, the instruments for data collection and data analysis.

Powell (1997) defines research methodology as the strategies surrounding the use of multiple methods of data collection as required by different types of attempts to achieve higher degrees of reliability and validity. According to Nachmias and Nachmias (1981:15), "methodology is a system of explicit rules and procedures upon which research is based and against which claims for knowledge are evaluated". This system is neither closed nor infallible. Rather, the rules and procedures are constantly improved; scientists look for new methods and techniques of observation, inference, generalisation, and analysis. As these are developed and found congruent with the underlying assumptions of the scientific approach, they are incorporated into the system of rules that make the scientific methodology. Adams and Schvaneveldt (1985) simply define a research methodology as the application of scientific procedures towards acquiring answers to a wide variety of research questions.

3.1 Research design

According to Kumar (2011), a research design is the logic that links the data to be collected and the conclusions to be drawn to the initial questions of a study; it ensures coherence. He suggests that another way of viewing a research design is to see it as an action plan for getting from the questions to conclusions. He adds that it should ensure that there is a clear view of what is to be achieved by the case study. As for Kombo and Tromp (2006: 70), "a research design is used to structure the research, to show how all of the major parts of the research project work together to address the central research questions." In this regard, it involves defining the basic components of the investigation, such as research questions and propositions, appreciating how validity and reliability can be established, and selecting a case study design.

Study designs are often equated with qualitative and quantitative research methods. Social surveys and experiments are frequently viewed as prime examples of quantitative research and

are evaluated against the strengths and weaknesses of statistical, quantitative research methods and analysis. Case studies, on the other hand, are often seen as prime examples of qualitative research, which adopts an interpretive approach to data, studies `things' within their context and considers the subjective meanings that people bring to their situation.

3.1.1 Case Study Design

According to Babbie and Mouton (2001), the methods used in any study are heavily influenced by the aims of the research and the specific questions that need to be answered. In order to collect the data for this study, a case study design was used.

A case study design was selected for this study so as to maximise what could be learnt in the period of time available for the study. The study was intended to be exploratory in nature, and the aim was to collect as much information as possible to gain an understanding of the nature, process and challenges of knowledge retention at the Natural Resources Development College. In this regard, the goal of this study was to investigate existing practices on knowledge retention at the Natural Resources Development College.

Hancock (2002) stresses that the values of a case study are seen through its ability to facilitate for in depth analysis of the study unit. In addition, case studies offer a richness and depth of information not usually offered by other methods. A case study is a detailed investigation of individuals, groups, institutions or other social units. A case study attempts to analyse in much more detail the variables relevant to the subject matter. The principle difference between a case study and other research methodologies is that the focus of attention is the individual case and not the whole population cases. This study therefore, sought to understand exactly what is going on regarding knowledge retention practices at NRDC.

Similarly, Bachor (2000) contends that the rationale for undertaking case study research has been due to the fact that it is a convenient and meaningful technique that provides face value credibility. In this regard, case studies can be seen to provide evidence or illustrations with which some readers can readily identify. The fundamental nature of case study as a research methodology is to describe as accurately as possible the fullest, most complete description of the case (Zucker, 2001). As for this study, the case study research methodology was selected so as to maximize what could be learnt, in the period of time available for the study.

One of the greatest advantages of a case study method is that it allows the researcher to concentrate on a specific instance, (in this case NRDC) or situation and to identify, or attempt to identify the various interactive processes at work (Bell, 1999). These processes could be peculiar to a particular case under investigation. This study concentrated on NRDC as the primary unit of analysis in order to maximize on the experiences of the college staff and thus to focus on the real situation. This was ideal for research where not much is known about the phenomenon under investigation. Hancock (2002), Rowley (2002) and Soy (2006) note the following as some of the virtues associated with case study research:

- It offers a richness and depth of information;
- It is a highly versatile research method and employs any and all methods of data collection from testing to interviewing;
- Enables an understanding of a complex issue or object;
- Can extend experience or add strength to what it is already known through previous research; and
- Puts emphasis on context which can help bridge the gap between abstract research and concrete practice by allowing researchers to compare their first-hand observations with the quantitative results obtained through other methods of research.

On the other hand, case studies as a research method have traditionally been viewed as lacking rigour and objectivity when compared to other social research methods. Hancock (2002) regards this area of research as fraught with danger, primarily due to the problem of subjectivity in interpreting data after it has been written down. Therefore, it is the primary function of the researcher to minimise the bias level in which the researcher is working. In this research, the researcher used multiple sources of evidence to substantially help in improving the validity and reliability of the research. By studying every aspect of the problem from as many angles as possible, and by using various sources of evidence, the case study research method is a powerful research tool (Hancock, 2002).

3.2 Use of Quantitative and Qualitative Approaches

There is increasing evidence that both quantitative and qualitative approaches are being applied more extensively in knowledge retention strategies. For example, Dewah (2012) applied both

approaches in a study conducted on knowledge retention strategies in selected Southern African Public Broadcasting Corporations whose aim was to establish how knowledge is captured and retained in those institutions.

This study used both qualitative and quantitative research methods. These methods were integrated in order to provide a full picture of the study. As for this study, the investigation was needed, which required qualitative methods for integration processes, accompanied by some measurement of outcomes, which required quantitative methods. Quantitative data can indicate relationships, which may not be noticeable to the researcher. On the other hand, qualitative data lies in the knowledge, it provides the dynamics of social process, change and social context so that it can answer 'how' and 'why' questions in these domain. But the results can be strengthened by quantitative support (Yin, 1994). Therefore, it was hoped that the combination of these techniques could provide comprehensive data on knowledge retention practices and strategies at NRDC.

3.3 Population of study

All research questions address issues that are of great relevance to important groups of individuals known as a population of study. The population of a study refers to a set of objects or people being studied and about which the researcher wants to determine some characteristics (Creswell, 2003). In other words, it is the entire group of people or objects to which the researcher wishes to generalise the study findings. Although, it is desirable to study the whole population, at times cost and time considerations make it impossible. In this study, the target population was 152, the members of staff at NRDC.

3.4 Sampling method and procedure

According to Johnson and Christensen (2004), sampling is the process of drawing a sample from a population. It is a mechanism for addressing the validity of a research undertaking. Two sampling procedures, systematic and purposive were used in this study.

3.4.1 Sampling

In order to arrive at the number of participants to be administered with the questionnaires; a probability sampling method called systematic random sampling was used. The serial number

was given to the population. In this method every nth element was selected from a list of a population having serial numbers.

In order to select respondents to be included in this study from the total population of 152 members of staff excluding those persons in administrative positions at NRDC, every 2nd person was selected. Therefore, the sample was obtained using the following formula: 152/2 + 10 =86. 86 respondents were selected, however only 70 respondents completed and returned the questionnaires. This gives us the response rate of 70/86=81.4% The advantage of using this method is that a large population can be analysed, every member of the population will have an equal chance to be included in the study, thus minimising biasness.

3.4.2 Purposive Sampling

Sampling for the participants to be interviewed was achieved through a non-probability sampling technique called purposive sampling. According to Creswell (2003), purposive sampling is most stressed as the rationale for undertaking case study research. Further, the idea behind qualitative research is to purposively select participants or sites that can best help the researcher to understand the principles and research questions. This method of sampling was adopted to capture respondents who were knowledgeable on the topic under investigation to provide the much needed information. A total of sixteen participants were purposively selected for interviews. These were selected on the basis of the administrative positions they held at the institution; such as Heads of Department.

3.5 Total Sample Size

The total sample size was 86 (questionnaire respondents) and 16 (administrative interview respondents, making a total study sample of 102.

3.6 Reliability and validity in case study measurement

Reliability is the degree to which a test consistently measures what it sets out to measure while at the same time yielding the same results. Creswell (2003) defines validity as the degree to which a test measures what it is supposed to measure. Therefore, reliability is a necessary precondition of validity.

Babbie and Mouton (2001) argued that it is difficult to assess the quality of the data that one collects. However, it is possible to assess the accuracy of the case study tools used to collect data about a phenomenon. An assessment of the collected data hinges upon determining the reliability and validity of the case study instruments (Creswell, 2003). For this study, pretesting the questionnaire was used as a tool for content validation. Content validity was also achieved by making sure that questions were related to the problem of knowledge retention at NRDC. Construct validity refers to the extent to which a researcher can claim that accurate inferences can be made from the operationalised measures in a study for the theoretical constructs on which they were based. Also construct validity is concerned with generalising from the specificities of a study to the broader concept that the study attempts to measure or draws conclusions. Construct validity was achieved by linking the items in the measuring instruments to the theoretical components of the research topic covered in the previous chapters.

Criterion validity is the one that reflects the use of a criterion – a well-established measurement procedure to measure the construct you are interested in. The measurement procedures could include a range of research methods. (For example, Surveys, Structured observation, or Structured interviews). Criterion validity was achieved by comparing the instruments of measurement to those published in the literature. According to Creswell (2003), reliability of a research tool depends on how other researchers can replicate the steps of the original research and have similar conclusions. Repeating a study in different settings or with different subjects is called replication (Creswell, 2003). Research findings are therefore considered to be reliable if they are repeatable, to the extent that repeated measurement would yield constant results (Yin, 1994). In order to get consistent answers to consistent questions, questionnaires and interview schedules were designed to collect the data for the study.

In this study reliability and validity of the data instruments were achieved by pre-testing the questionnaire and interview guide; as well as adhering to other questionnaire and interview guide formats that have been tested in the literature so that one does not go beyond a certain number of questions.

3.6 .1 Data Collection Instruments

One of the safeguards against getting unreliable information is ensuring that the respondents are capable of supplying the required information with some degree of accuracy (Creswell, 2003). In

regard, staff at NRDC were under study and took cognisance of the fact that respondents were competent to respond to the questionnaires and semi structured interviews.

Semi-structured interviews were held with administrative staff at the College. Furthermore, other multiple sources of data such as document reviews of institutional reports, minutes and newsletters were carried out. The use of multiple research instruments in this study helped for triangulation of data that was collected in order to test validity (Creswell, 2003). The survey methodology, therefore, helped the researcher to remedy the weaknesses of bias and difficulty in generalisation associated with the case study approach.

3.6.2 Questionnaires

Semi - structured questionnaire surveys are the most commonly used research method in knowledge management studies and can be a rich and reliable source of research data. For example, Wamundila and Ngulube (2011), Shaw and Williams (2009), Phaladi (2011), just to mention a few, used questionnaires to collect data on the state of the knowledge management. Some of these studies were discussed under review of literature in Chapter Two.

In this study, a questionnaire was a major technique used to collect data in which each respondent was asked to give answers to the same set of questions and statements in a predetermined order in the absence of the researcher. A semi - structured questionnaire was designed and self-administered to members of staff at Natural Resources Development College (NRDC). By presenting all respondents with the same standardised questions a high reliability of response can be achieved. A few questions were unstructured, In this regard, questionnaires provide a stable and consistent and uniform measure without variation.

The researcher was attracted to use a questionnaire because it is relatively inexpensive and it allows a large number of respondents to be surveyed in a relatively short period of time, when compared with other data collection tools (Creswell, 2003). The impersonal nature of questionnaire survey, for example, standardised wording and sequence of questions, ensures some uniformity from one measurement situation to another, because the most common pitfall in qualitative data collection is ‘bias’ in the selection of informants and in the evaluation of statements. In addition, questionnaires allow respondents to answer questions at times that are convenient to them. Self-administered questionnaires also permit the respondents to consult with

other persons and records before responding. Therefore, questionnaires give privacy in responding as well as affording the respondents the opportunity or time to look up information in cases where they are not sure of the answers.

On the other hand, questionnaires have limitations such as low response rates, reporting errors, and lack of control over how respondents interpret questions or opportunity to probe or correct any misunderstandings.

3.6.3 Design of the Questionnaire

The questionnaire used in this study was divided into eight sections (Appendix 1). A questionnaire has basic instructions on completing it at the beginning. In addition, some questions have individual instructions to facilitate proper answering. The questionnaire was divided into sub-sections based on the research issues and objectives outlined in sections 1.5 and 1.5.1 of Chapter One. The aim was to improve the flow of the questionnaire. If questions about the same topic are included in several different places in the questionnaire, a respondent may become confused by perceived redundancy or hostile because of perceived carelessness and treat the questionnaire with less seriousness than the researcher would like. In addition, the questions were consecutively numbered in order to make them easy to follow. Each question was numbered to prevent questions from being omitted in error and to facilitate the use of skip instructions. Questions were only printed on one side of the page in order to avoid cluttering it.

However, in order to include all the possible responses that might be expected, closed-ended items had some open-ended options such as: “other, please specify”. Closed questions gave the respondent the chance of choosing from two or more fixed alternatives. The use of the alternative represents an excellent compromise between closed and open ended response formats in that it is an open-ended question within a closed-ended format. The coding process often requires that the researcher interprets the meaning of responses. The possibility of misunderstanding the responses and researcher bias cannot be totally ruled out. There is also a danger of getting answers that are essentially irrelevant to the researcher’s objectives. Despite the fact that closed-ended items are likely to limit the possibility of including all expected response categories, the main reason for their continued popularity lies in providing greater uniformity of responses (Babbie and Mouton, 2001).

Before a questionnaire was used in the study, it was tried on a sample of 5 NRDC staff, to check ease of completion and whether the procedure had the desired effect. However, the staff respondents were selected on the basis of convenience and availability as it was pretesting of data collection instrument.

This gave the researcher the opportunity to refine the instrument, as a result, maximise reliability and validity of the instruments were achieved (Creswell, 2003). Through the pretesting of the questionnaire, unclear questions and instructions were identified and improved upon by recasting them. Accordingly, technical terms and abbreviations were identified and explained, while double-barrelled questions were unpacked to ensure that one concept or issue was included in the questions. The questionnaire was also modified to remove some ambiguities identified by the pre-test (Creswell, 2003).

A questionnaire was self-administered to all the 86 respondents at NRDC. The covering letters described the research topic of the study in order to motivate the respondents to cooperate. It emphasised the importance of the research as well as how the information was to be used.

3.7 Interviews

Semi-structured interviews were used with open-ended questions to collect data from 16 administrative interviews; i.e. those employees holding administrative positions or were doing policy related work at the institution. This type of an interview was chosen because it was less formal for the interviewer; and could explore issues that emerge by further asking follow-up questions while still covering the same areas of data collection. In this study, interviews were used for verifying, amending and extending data, and gathering facts and explanations. Therefore, interviews provided an in-depth understanding, insights of people's experiences, and help to approach the research questions from different dimensions (Yin, 1994). Such flexibility makes the interview a good technique for exploration.

However, interviews have their own shortcomings such as being relatively expensive and time consuming. They also face the common problem of bias in the interview processes; that interviewees can only hear what they want or interviewees give what interviewers want to hear (Yin, 1994). In addition, the outcome of the interview could also be determined by the personality of both the interviewer and respondent.

On the other hand, interviews have a number of advantages such as the most effective way of enlisting the co-operation of most populations (Creswell, 2003). The quality of data is usually superior to that obtained by other methods. Therefore, interviews were used to gather supplementary data as well as verifying some points that emanated from some of the responses to the questionnaires. Only personal interviews were used in this study. Even if personal interviews are relatively expensive, they produce a better response rate than the questionnaire (Creswell, 2003).

3.7.1 Administering Interviews

It has been argued that validity is a persistent problem in interviews. For example, validity can be compromised by asking leading questions, and bias on the part of both the interviewer and the respondent (Babbie and Mouton, 2001). One way of avoiding bias was desisting from seeking answers that support any preconceived notions of the interviewer when conducting the interview. Leading questions were also avoided because they tend to influence the answers of the respondent.

3.8 Documentary Review

A review of existing literature was done to gather more relevant data on knowledge retention at NRDC. This process was done by going through both hard and online documents that were available at the time of conducting this research. These included desk research by collecting readily available materials and information from Internet, journals, annual reports and both past and present strategic plans for NRDC and books on knowledge management from its perceived origins to the present.

3.9 Data Analysis

Data analysis is the process of categorising, ordering, manipulating and summarising of data to find answers to the research questions. The data that was collected through the questionnaire was evaluated and cleaned before coding (Creswell, 2003). These two activities are sometimes referred to as data editing. Data editing helps to check for ambiguity, completeness, comprehensibility, internal consistency, relevance, and reliability (Babbie and Mouton, 2001). During this process, data was examined to look for extreme values, conflicting answers, handwritten notes, errors in recording, and other indicators that suggest unreliable measurements. It involved checking whether or not there was an answer to every question. A decision was made

during editing to content analyse responses such as “cannot remember” or “unsure”. The uniformity of the interpretation of the questions by the respondents was also checked during the process.

On the other hand, the responses from the interviews were analysed by developing a descriptive framework. A framework of sections reflecting the themes was developed and evidence was gathered within relevant themes, and analysed and compared in the categories in order to achieve a description that was incorporated from multiple sources of evidence.

3.10 Data coding

Data coding involves assigning a label to each question or variable, and a number or value to each response category. In this case, each completed questionnaire that was received was assigned a unique case number, which was inserted in the space provided on the first page of each questionnaire (Babbie and Mouton, 2001). Each questionnaire represented a case that was studied, and the code “caseid” was assigned in the first column of the SPSS Data Editor. The identifier “caseid” was used for each responding case to facilitate checking the data for errors. Without the unique number, it would be extremely difficult to tie data back to the original questionnaire, thus, making the task of identifying or correcting data entry errors complicated. Some data handling and analytical tasks are possible only if there is a way of identifying individual cases (Babbie and Mouton, 2001).

Open-ended questions in the questionnaire and interviews were content analysed; and grouped into categories that were tabulated manually. A category is a set of criteria, which are integrated around a theme (Creswell, 2003). The first step in content analysis entailed the construction of categories. Thus, after identifying the categories, data was coded. The coded data offered some evidence about the dominant categories and trends. Some of the data was presented in narrative form or was integrated into the quantitative data collected by means of questionnaire and observation for analysis using SPSS.

3.10.1 Computer processing

In this study, Microsoft Word was used for word-processing and SPSS Version 16.0 for Windows for statistical processing. The researcher directly typed the data into the computer.

Computer processing helps to speed up processing and analysis of data as well as saving and eliminating a good deal of tedious and repetitive work (Creswell, 2003). The data output from the computer was examined for statistical outliers or extreme cases caused by recording errors. After the data was cleaned, it was then ready for tabulation and statistical analysis. This means that description of the responses made to each of the questions was done. SPSS facilitated the sorting of data and computing of frequencies, sums and percentages.

3.11 Ethical considerations

Questions of access, power, harm, deception, secrecy and confidentiality are all issues that the researcher has to consider and resolve in any research context (Creswell, 2003). Informed consent occupies a central place in the ethics literature. In order to address the issue of ethics of research, the respondents to the questionnaire and the interviewees were told the purpose of the study so they could make an informed decision as to whether to participate or not. Further, the study strived to maintain objectivity in gathering and analysing the data.

3.12 Evaluation of research methodologies

No one type of research design is universally better or worse than the other. They are different and used for different purposes (Creswell, 2003). Both quantitative and qualitative approaches were employed in this study. The case study research methodology has been used because it is often viewed as a useful tool for preliminary and exploratory research. The purpose of the research was to provide basic information needed to enable staff to analyse, plan and implement sound existing practices of knowledge retention at NRDC.

The major strengths of a case study as compared to other methods are that evidence can be collected from multiple sources. This is what is referred to as triangulation. Triangulation uses evidence from different sources to corroborate the same fact or finding. However, its major limitation is that it cannot provide information objectively due to the problem of subjectivity in interpreting data after it has been written down. The use of more than one method in collecting data for this study was aimed at enhancing the validity and reliability of the results. Interviews and documents review methods were used in conjunction with a questionnaire to collect data for the study.

3.13 Limitations of the Study

The limitations of this study are that it only focused on knowledge retention practices and strategies at Natural Resources Development College; as a result, generalisation of the findings to other similar colleges in Zambia might not be suitable. However, certain experiences might be of benefit to other institutions in the country and the rest of the world.

3.14 Summary of Chapter Three

This chapter emphasised that research procedures are fundamental to gathering data to address a research question. It outlined the methods and techniques that were used in investigating knowledge retention practices at Natural Resources Development College. It has revealed that research is basically done to describe or understand certain situations. The research process is commonly informed by either the qualitative or quantitative research paradigm. At times, a combination of both models is used, as is the case in this study. The questionnaire was used as the main data collection tool employed by the study. Interviews, documents reviews and observations supplemented the questionnaire. The units of analysis and the methods used for data collection and analysis have also been discussed in this chapter.

CHAPTER FOUR
PRESENTATION OF FINDINGS

4.0 Overview

This chapter presents the research findings from the data collected on knowledge retention practices and strategies at Natural Resources Development College (NRDC). The findings has been arranged according to the research objectives and questions as set out in chapter one.

4.1 Response rate

A total of 86 questionnaires were distributed among staff at NRDC, out of which 70 questionnaires were completed and returned giving a response rate of 70/86= 81.4%. See Table 1.

Table 1: Distribution of respondents by gender

Gender	Frequency	Percentage
Male	37	53
Female	33	47
Total	**70**	**100**

Out of a total number of 70 respondents, there were 53% male and 47% female respondents. In terms of age, the majority of the respondents, 38.6% were between 35 and 44 years old. Another 31.4% of the respondents were aged between 45 and 54 years old. This was followed by 29% of the respondents who were aged above 55 years old; while two 2.9% were between 15 and 24 years old. The findings indicate that 38.6% of the respondents were aged between 35 and 44 years old.

4.1.1 Level of Education Attained

Question three (Appendix 1) asked respondents to provide information on their highest academic qualification obtained. Out of the total number of 70 respondents, the majority of the respondents, 40% had a Bachelor's Degree while one (1%) of the respondent had a Postgraduate Diploma. The findings suggest that the majority of the respondents had Bachelor's Degrees. Table 2 shows academic qualification levels of the respondents.

Table 2: Respondents' highest academic qualification

Qualifications	Frequency	Percentage
Doctorate	2	3
Masters	18	26
Postgraduate Diploma	1	1
Bachelor's Degree	28	40
Diploma	14	20
Certificate	7	10
Total	**70**	**100**

4.1.2 Number of years worked at NRDC

In Table 3 the majority indicates that 41.4% of the respondents had worked at NRDC for five years and below while only one (1.4%) respondent had worked for 26 years and above.

Table 3: Respondents' work experience

Work experience	Frequency	Percentage
5 years and below	29	41
6- 10 years	18	26
11- 15 years	12	17
16- 20 years	4	6
21- 25 years	6	9
26 years and above	1	1
Total	**70**	**100**

4.1.3 Area of Specialisation

Question five asked the respondents to indicate their areas of specialisation. The responses in Table 4 show that 14% of the respondents were specialised in Animal Science and Agricultural Business Management (14%). Those specialised in Basic Science and Fisheries were 13% and Agricultural Engineering (13%), respectively. Twelve (12%) of the respondents specialised in Crop Science. The remaining respondents either specialised in Education Extension (4%), Food Nutrition (4%) and Water Engineering (4%). As shown in Table 4, the majority of the respondents (22%) did not have a specific area of specialisation.

Table 4: Area of specialisation for respondents

Area of Specialisation	Frequency	Percentage
Did not have area of specialisation	15	22
Animal Science	10	14
Agricultural Business Management	10	14
Basic Science and Fisheries	9	13
Agriculture Engineering	9	13
Crop Science	8	12
Education Extension	3	4
Water Engineering	3	4
Food Nutrition	3	4
Total	**70**	**100**

4.2 Type of Knowledge Retained

Question 6 of this study asked the respondents to indicate the type of knowledge they were retaining at Natural Resources Development College. Responses in Figure 1 show that the majority of the respondents 76% were retaining explicit knowledge, while 24% of the respondents retained tacit knowledge. The findings of this study reveal that explicit knowledge was largely retained by staff at NRDC compared to tacit knowledge.

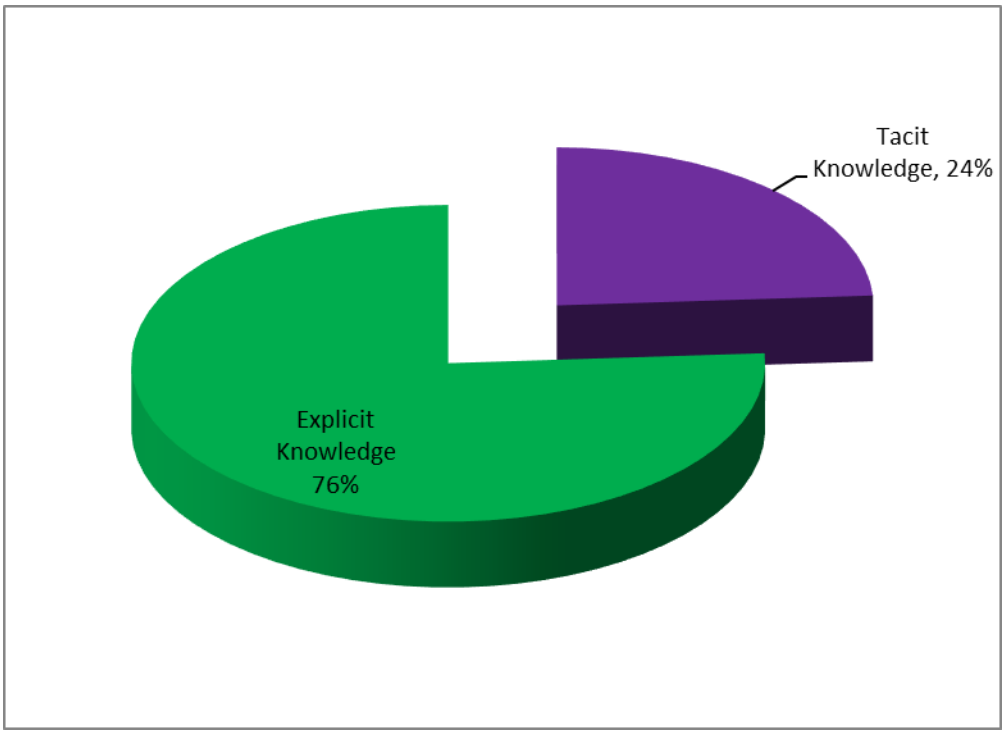

Figure 1: Type of knowledge retained at NRDC

Table 5 shows a cross tabulation between education level and type of knowledge being retained. The table shows that all the certificate holders support explicit Knowledge as compared to none. 57.1% of the Diploma holders support explicit Knowledge as compared to 42.9% of those who support tacit knowledge. More of the Bachelor's degree holders (78.6%) support explicit knowledge and only 21.4% support tacit knowledge. 88.9% of Masters Holders support explicit knowledge as compared to 11.1% who support tacit knowledge. Only one staff had a postgraduate degree and supported tacit knowledge and only 2 had Doctorates of which all supported tacit knowledge.

Table 5: Educational level and type of Knowledge Retained

			Type of Knowledge Retained		Total
			Explicit Knowledge	Tacit Knowledge	
Educational Level	certificate	Count	7	0	7
		%	100.0%	.0%	100.0%
	diploma	Count	8	6	14
		%	57.1%	42.9%	100.0%
	bachelor's degree	Count	22	6	28
		%	78.6%	21.4%	100.0%
	masters	Count	16	2	18
		%	88.9%	11.1%	100.0%
	postgraduate diploma	Count	0	1	1
		%	.0%	100.0%	100.0%
	doctorate	Count	0	2	2
		%	.0%	100.0%	100.0%
Total		**Count**	**53**	**17**	**70**
		%	**75.7%**	**24.3%**	**100.0%**

Table 6 shows a cross tabulation between work experience and type of knowledge retained. Most of the staff (72.4%) with less than 5 years of work experience retained explicit knowledge and 27.6 retained tacit knowledge. 77.8% of those with 5-10 years of experience retained explicit knowledge and only 22.2% retained tacit knowledge. 58.3% of those with 11-15 years of experience retained explicit knowledge and 41.7% retained tacit knowledge. All 4.6 and 1

members of staff with 16-20, 21-25 and 26+ years of work experience, respectively, retained explicit knowledge.

Table 6: Work Experience and Type of Knowledge Retained

			Type of Knowledge Retained		Total
			Explicit Knowledge	Tacit Knowledge	
No. of years worked at NRDC	less than 5 years	Count	21	8	29
		%	72.4%	27.6%	100.0%
	5-10 yrs.	Count	14	4	18
		%	77.8%	22.2%	100.0%
	11-15 yrs.	Count	7	5	12
		%	58.3%	41.7%	100.0%
	16-20 yrs.	Count	4	0	4
		%	100.0%	.0%	100.0%
	21-25 yrs.	Count	6	0	6
		%	100.0%	.0%	100.0%
	26+ yrs.	Count	1	0	1
		%	100.0%	.0%	100.0%
Total		**Count**	**53**	**17**	**70**
		%	**75.7%**	**24.3%**	**100.0%**

4.3 Tools and Methods used for Knowledge Retention

When the respondents were asked to indicate the method used for retaining knowledge, the findings in Figure 2 show that 44.6% of the respondents indicated that the most common method used for retain knowledge was documentation process, 31.4% of the respondents reported that they were using mentoring of new employees, 11.6% of the respondents reported that they were archiving the knowledge, 6.6% of the respondents reported that they were using the method of interviewing retirees and recording their experiences, 5.8% of the respondents reported that they were using the method of inviting retirees as consultants.

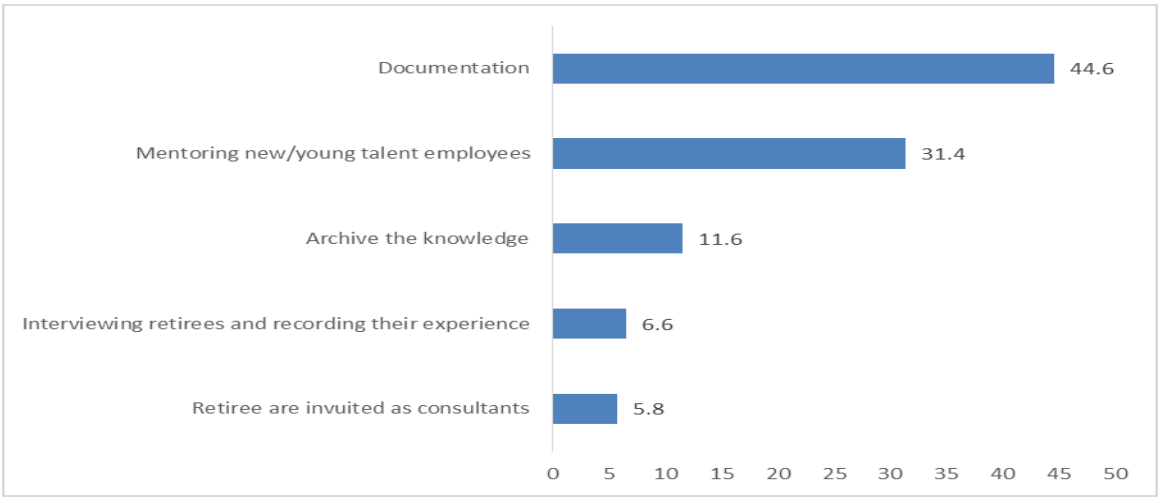

Figure 2: Method/way of retaining organisational knowledge

The interviewees were asked on the methods they used to capture, preserve and retain knowledge at NRDC. The responses from the interviewees were:

- *Research and consultancy*
- *Electronic and modules (Manuals)*
- *Documentation process*
- *Reports writing, internet and sharing with staff*
- *Mentoring programme and meeting with staff*

When the interviewees were asked to state their recommended method that should be used to retain knowledge that may be lost, the interviewees stated that.

> *Extending of retirements age, mentoring programmes, documentation process, paper presentation on the subject and establish departmental resource centres.*

Question 17 (Appendix 1) asked the respondents to indicate the knowledge storage media that was used to store knowledge at the College. From the findings, 46.6% of the respondents indicated that paper records were the major knowledge storage media. This was followed by 24.1% of the respondents who indicated flash disks, 14.7% of the respondents who indicated databases, 10.3% of the respondents who indicated lessons learned archives and the least used knowledge storage media was audio tapes which was indicated by three respondents representing 4.3%. The findings seem to suggest that paper records were used as a major knowledge storage media at the Natural Resources Development College, see figure 3.

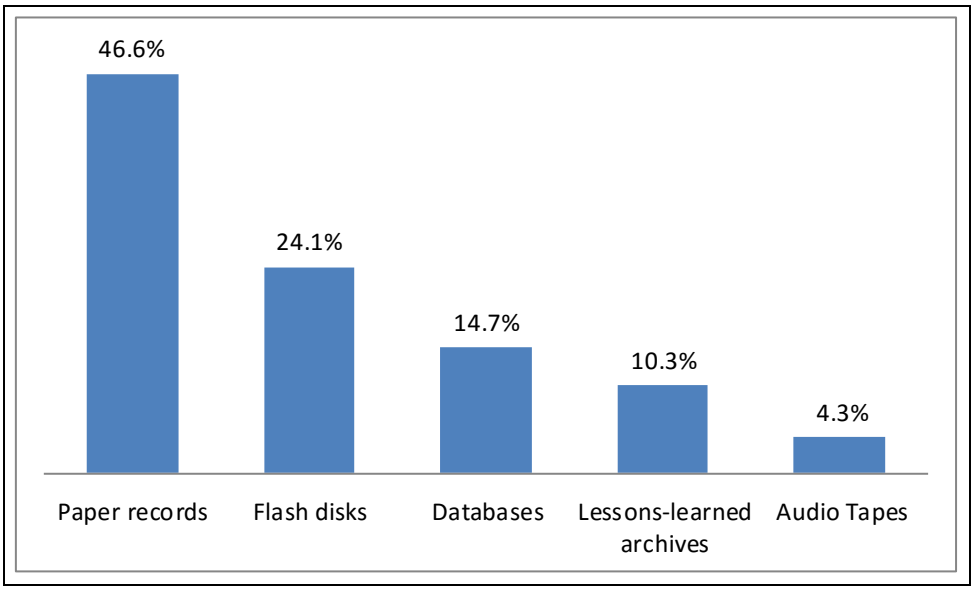

Figure 3: Knowledge storage

4.3.1 Information and Communication Technologies

When the respondents were asked to indicate the type of ICTs they had access to in their departments for carrying out their work, the findings in Figure 4 show that 20% of the respondents reported that they had access to computers, 18% of the respondents had access to intranet/electronic mail, 14% of the respondents had access to telephone/cell phone, 11% of the respondents were using websites and discussions forums, respectively. Information and Communication Technologies such as virtual conference rooms, twitter, blogs and knowledge directories were among those that were insignificantly used by the staff at the Natural Resources Development College. The findings of the study revealed that the computers were the most used ICTs by staff to conduct their works. See figure 4.

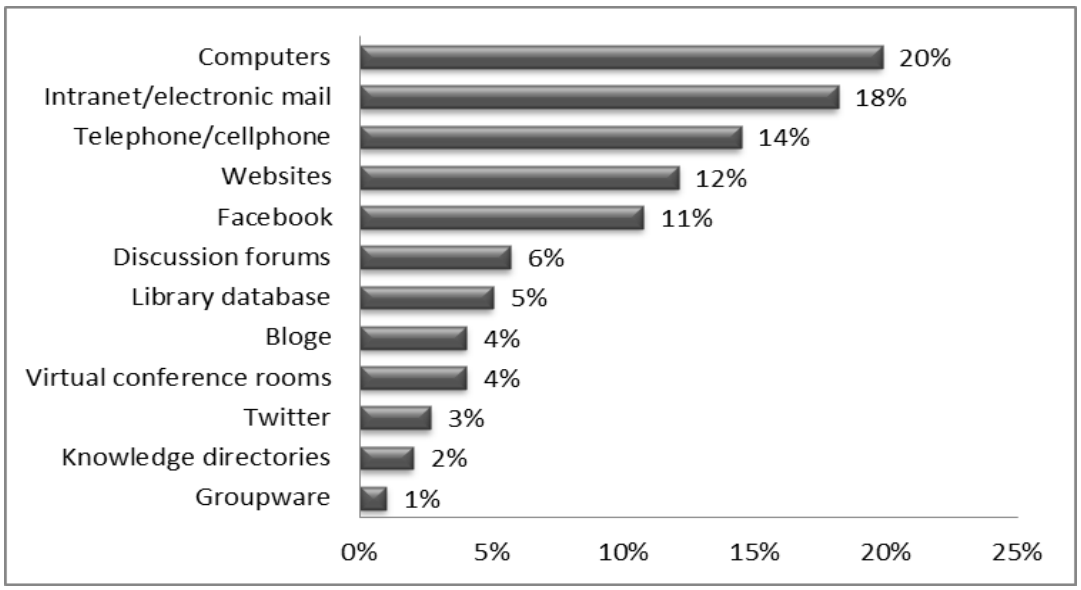

Figure 4: Information and Communication Technologies Available for use at NRDC

Respondents were also asked to indicate whether the Internet was freely accessible to every employee at NRDC. The majority 64.3% of the respondents answered in the affirmative, while 35.7% of the respondents said no. When the interviewees were asked to indicate how they use ICT's to retain organisational knowledge. The responses were:

> *They use computers to store necessary data, information, knowledge, notes and documents. Email for sharing notes and documents.*

4.4 Knowledge Retention Strategies and Practices

Probing further, the respondents were asked to indicate whether they had knowledge retention strategies and practices at NRDC. From the findings, 67% of the respondents responded in affirmative, while 33% of the respondents said no. The findings suggest that there were knowledge retention strategies and practices at Natural Resources Development College.

When the respondents were asked to indicate to what extent NRDC required a knowledge retention policy to enhance retention of knowledge for operations, the majority 57% of the respondents strongly agreed, 37% of the respondents agreed, 3% of the respondents strongly disagreed, while another 3% disagreed. The findings of this study revealed that the majority of the respondents strongly agreed that NRDC required a knowledge retention policy to enhance knowledge retention for operations.

When respondents were asked to explain briefly the knowledge retention strategies they had at NRDC. The following were some of the responses obtained from respondents:

- *The production of modules, manuals and notes;*
- *Hosting workshops of a technical nature in which staff and students participated to gain knowledge and skills;*
- *Managing knowledge through what was practiced in the laboratory;*
- *Visiting other institutions on educational tours for field work;*
- *Keeping student and staff records;*
- *Importing mechanical engineering knowledge;*
- *Motivating workers to avoid frustration respectively;*
- *Producing quarterly and annual reports;*
- *Record management, record keeping of vital activities for references;*
- *Placing workers in different fields according to the knowledge they have;*
- *Sharing new information;*
- *Mentorship and orientation of new staff and;*
- *Documentation on paper and computers.*

Respondents were also asked whether the Natural Resources Development College was working with other higher learning institutions in any knowledge retention practices. The findings indicate that the Natural Resources Development College was collaborating with other institutions of higher learning in knowledge retention practices through joint research projects and joint seminars/workshops, respectively. 31% of the respondents reported that the College was engaged in joint research projects with other institutions of higher learning. 29% of the respondents reported that they were involved in joint seminars or workshops. 26% of the respondents reported that they worked with other higher learning institutions in knowledge retention practices through exchange of staff. This was followed by 14% of the respondents who reported that they were involved in exchange of information, peer reviews, through presentation of knowledge with colleagues in the same field.

4.4.1 Managers role in promoting Knowledge Retention

The results of the analysis for the role the managers played in promoting knowledge retention at Natural Resources Development College show that 25.3% of the managers respondents encouraged staff to share knowledge, 22.4% of the respondents promoted knowledge retention by holding regular meetings with other staffs, seven 10% of the respondents used databases to promote knowledge retention at the College. The findings of this study in Figure 5 show that managers at the Natural Resources Development College promoted knowledge retention and the

most common strategies used were encouraging staff to share knowledge and hold regular meetings with other staff. See Fig. 5.

Figure 5: Strategies used in promoting knowledge retention

Table 7 shows the relationship between gender and knowledge retention strategies and practices. The table shows that most of the males, 33.3%, had joint seminars/workshops as knowledge retention practices as compared to 28.8%, 24.2% and 13.6% who had joint research projects, in exchange of information with colleagues and exchange of staff, respectively, as knowledge retention practices. And most of the females, 38% had joint seminars/workshops as their knowledge retention practices as compared to 26%, 24% and 12% who had joint research, exchange of information with colleagues and exchange of staff as knowledge retention strategies and practices, respectively.

Table 7: Gender and Knowledge Retention Practices/ Strategies

			Knowledge Retention Practices				Total
			joint research projects	joint seminars / workshops	exchange of staff	Exchange of information peer reviews through presentation of knowledge with colleagues in the same field	
Sex	male	Count	19	22	9	16	66
		%	28.8%	33.3%	13.6%	24.2%	
	female	Count	13	19	6	12	50
		%	26.0%	38.0%	12.0%	24.0%	
Total		**Count**	**32**	**41**	**15**	**28**	**116**

Table 8 shows a cross tabulation between gender and strategies used in promoting knowledge retention. Most of the males (62.2%) encouraged staff to share knowledge with co-workers as a strategy to promote knowledge retention. Also most of the females (63.6%) encouraged staff to share knowledge with co-workers as a strategy to promote knowledge retention.

Table 8: Gender and Strategies used in Promoting Knowledge Retention

			Strategies Used									Total
			Establishing communities of practice	Encouraging staff to share knowledge with co-workers	To attend informal gatherings where knowledge is being shared	Appointing mentors	Regular meeting with other staff	Use of databases	Inviting experts to give lectures	Use information knowledge repositories	None	
Sex	male	Count	7	23	10	5	20	9	8	8	4	37
		%	18.9%	62.2%	27.0%	13.5%	54.1%	24.3%	21.6%	21.6%	10.8 %	
	female	Count	5	21	4	4	19	8	7	8	4	33
		%	15.2%	63.6%	12.1%	12.1%	57.6%	24.2%	21.2%	24.2%	12.1 %	
Total		Count	12	44	14	9	39	17	15	16	8	70

Table 9 shows the relationship between education level and strategies used in promoting knowledge retention practices. Most of the certificate holders (57.1%) encouraged staff to share knowledge with co-workers and having regular meetings with other staff as a strategy to promote knowledge retention. Most of the Diploma holders (71.4%), had regular meetings with other staff members as a strategy to promote knowledge retention. Most of the bachelor's degree and masters holders 67.9% and 94.4%, respectively, encouraged staff to share knowledge with co-workers and having regular meetings with other staff as a strategy to promote knowledge retention. All the 3 post graduate degree holders encouraged staff to share knowledge with co-workers, used databases and invited experts to give lectures. And the remaining 3 Doctorate

holders had regular meetings with co-workers, used databases and used information knowledge repositories.

Table 9: Education Level and Strategies used in Promoting Knowledge Retention

			Strategies used									Total
			Establishing communities of practice	staff to share knowledge with co-workers	where knowledge is being shared	Appointing mentors	Regular meeting with other staff	q15f.use of databases	experts to give lectures	knowledge repositories	none	
	certificate	Count	3	4	0	2	4	0	0	2	0	7
		%	42.9%	57.1%	.0%	28.6%	57.1%	.0%	.0%	28.6%	.0%	
	diploma	Count	2	3	2	2	10	2	4	0	1	14
		%	14.3%	21.4%	14.3%	14.3%	71.4%	14.3%	28.6%	.0%	7.1%	
	bachelor's degree	Count	5	19	8	5	14	7	7	9	7	28
		%	17.9%	67.9%	28.6%	17.9%	50.0%	25.0%	25.0%	32.1%	25.0%	
	masters	Count	2	17	4	0	9	5	3	3	0	18
		%	11.1%	94.4%	22.2%	.0%	50.0%	27.8%	16.7%	16.7%	.0%	
	postgraduate degree	Count	0	1	0	0	0	1	1	0	0	1
		%	.0%	100.0%	.0%	.0%	.0%	100.0%	100.0%	.0%	.0%	
	doctorate	Count	0	0	0	0	2	2	0	2	0	2
		%	.0%	.0%	.0%	.0%	100.0%	100.0%	.0%	100.0%	.0%	
Total		Count	12	44	14	9	39	17	15	16	8	70

Table 10 shows staff's work experience and strategies used in promoting knowledge retention. Most of the staff with less than 5 years work experience (62.1%) had regular meetings with other staff members as a strategy for knowledge retention. 94.4% of those with 5-10 years work experience encouraged staff to share knowledge with co-workers and having regular meetings with other staff as a strategy to promote knowledge retention. 58.3% of 11-15 work experience used databases as a stratagy to promote knowledge retention. Those who had worked for 16-20 years mostly encouraged staff to share knowledge with their co-workers and the 5 who had worked at NRDC for more than 26 years each, encouraged staff to share knowledge with their co-workers, had regular meetings with other staff, used databases, invited experts to give lectures and used information knowledge repositories .

Table 10: Work Experience and Strategies used in promoting Knowledge Retention

			Strategies Used									
			Establishing communities of practice	Encouraging staff to share knowledge with co-workers	To attend informal gatherings where knowledge is being shared	Appointing mentors	Regular meeting with other staff	Use of databases	Inviting experts to give lectures	Use information knowledge repositories	none	Total
No. of years worked at NRDC	less than 5 years	Count	0	13	6	2	18	2	7	8	8	29
		%	.0%	44.8%	20.7%	6.9%	62.1%	6.9%	24.1%	27.6%	27.6%	
	5-10 yrs.	Count	5	17	5	3	7	5	1	3	0	18
		%	27.8%	94.4%	27.8%	16.7%	38.9%	27.8%	5.6%	16.7%	.0%	
	11-15 yrs.	Count	2	6	1	2	6	7	2	2	0	12
		%	16.7%	50.0%	8.3%	16.7%	50.0%	58.3%	16.7%	16.7%	.0%	
	16-20 yrs.	Count	1	3	0	2	1	0	0	2	0	4
		%	25.0%	75.0%	.0%	50.0%	25.0%	.0%	.0%	50.0%	.0%	
	21-25 yrs.	Count	4	4	2	0	6	2	4	0	0	6
		%	66.7%	66.7%	33.3%	.0%	100.0%	33.3%	66.7%	.0%	.0%	
	26+ yrs.	Count	0	1	0	0	1	1	1	1	0	1
		%	.0%	100.0%	.0%	.0%	100.0%	100.0%	100.0%	100.0%	.0%	
Total		Count	12	44	14	9	39	17	15	16	8	70

4.4.2 Reasons for knowledge retention

The respondents were asked what they considered as their reasons for knowledge retention at the Natural Resources Development College. From the findings, it was revealed that the majority 19.6% of the respondents indicated that the reason for knowledge retention was to support management strategic objectives, 18.7% of the respondents gave a reason that it was to enhance quality of service, while 17.8% of the respondents indicated that the reason was to enhance productivity, followed by 16% of the respondents who mentioned that it was to impart training, 7.8% of the respondents who said the reason was to mentor junior colleagues. Enhancement of one's career, to earn promotion, to be rewarded, to get recognition and to satisfy self-fulfilment needs were the least reported reasons. The findings of the study suggest that the major reason for knowledge retention at the Natural Resources Development College was to support management strategic objectives. See Fig. 6.

Figure 6: Reasons for knowledge retention

The results indicate that slightly more of the males than females (13.5 % compared to 12.1 %) who indicated that the reason for knowledge retention was just to be rewarded. See Table 11. However, the differences in the percentages and $p>0.05$ are not significant. This therefore suggests that there is no significant relationship between gender and reasons for knowledge retention. The survey results indicate that both male and female members of staff give knowledge retention not just for their own benefits but for the good of the institution. See Table 11 and 12.

Table 11: Cross tabulation between gender and reasons for knowledge retention (to be rewarded)

			To be rewarded		
			yes	no	Total
Sex	male	Count	5	32	37
		%	13.5%	86.5%	100.0%
	female	Count	4	29	33
		%	12.1%	87.9%	100.0%
Total		Count	9	61	70
		%	12.9%	87.1%	100.0%

Table 12: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.030[a]	1	.862		
Continuity Correction	.000	1	1.000		
Likelihood Ratio	.030	1	.862		
Fisher's Exact Test				1.000	.574
Linear-by-Linear Association	.030	1	.863		
N of Valid Cases	70				

P=0.862

The percentage differences show that the less educated ones are likely to support knowledge retention (To enhance quality of service). Those with diplomas (85.7%) are likely to support the idea of knowledge retention than those with bachelor's degrees and masters, 67.9% and 44.4% respectively. See Table 13. The p value of 0.019 ($p<0.05$) suggests that there is a statistical significant relationship between level of education attained and reasons for knowledge retention (To enhance quality of service). See Table: 14.

Table 13: Cross tabulation between education level and reasons for knowledge retention (to enhance quality of service)

			To enhance quality of service		
			yes	no	
Educational level	certificate	Count	2	5	7
		%	28.6%	71.4%	100.0%
	diploma	Count	12	2	14
		%	85.7%	14.3%	100.0%
	bachelor's degree	Count	19	9	28
		%	67.9%	32.1%	100.0%
	masters	Count	8	10	18
		%	44.4%	55.6%	100.0%
	postgraduate degree	Count	0	1	1
		%	.0%	100.0%	100.0%
	doctorate	Count	0	2	2
		%	.0%	100.0%	100.0%
Total		Count	41	29	70
		%	58.6%	41.4%	100.0%

Table 14: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.564[a]	5	.019
Likelihood Ratio	15.219	5	.009
Linear-by-Linear Association	2.312	1	.128
N of Valid Cases	70		

P=0.019

The percentage differences show that the more experienced ones are more likely to support knowledge retention **(**To support management strategic objectives). Those that had worked for 26 years plus support knowledge retention policies than those with 5 years and less. See Table 15. The p value of 0.037 ($p<0.05$) suggests that there is a statistical significant relationship between work experience and reasons for knowledge retention **(**To support management strategic objectives). See Table 16.

Table 15: Cross tabulation between work experience and reasons for knowledge retention (To support management strategic objectives)

			To support management strategic objectives		
			yes	no	Total
No. of years worked at NRDC	less than 5 years	Count	13	16	29
		%	44.8%	55.2%	100.0%
	5-10 yrs	Count	13	5	18
		%	72.2%	27.8%	100.0%
	11-15 yrs	Count	6	6	12
		%	50.0%	50.0%	100.0%
	16-20 yrs	Count	4	0	4
		%	100.0%	.0%	100.0%
	21-25 yrs	Count	6	0	6
		%	100.0%	.0%	100.0%
	26+ yrs	Count	1	0	1
		%	100.0%	.0%	100.0%
Total		Count	43	27	70
		%	61.4%	38.6%	100.0%

Table 16: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.827[a]	5	.037
Likelihood Ratio	15.553	5	.008
Linear-by-Linear Association	7.528	1	.006
N of Valid Cases	70		

P=0.037

p>0.05 shows that there is no significant relationship between area of specialisation and reasons for knowledge retention. Someone's field area of specialisation does not affect their support on knowledge retention policy or not. See Table 17.

Table 17: Pearson correlation between area of specialisation and reasons for knowledge retention

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.118[a]	8	.422
Likelihood Ratio	11.046	8	.199
Linear-by-Linear Association	.135	1	.713
N of Valid Cases	70		

P=0.422

4.5 Challenges of Knowledge Retention Practices

The respondents were asked what turnover and mobility challenges the institution faced. The findings of this study in figure 7 show that the majority 29% of the respondents reported that retirements were the major challenges the College was facing, transfers represented by 24% of the respondents came second in the ranking of the challenges. This was followed by the challenges of deaths at 22%, secondments at 14% and resignations were reported as the least challenges represented by 11% of the respondents. See Figure 7.

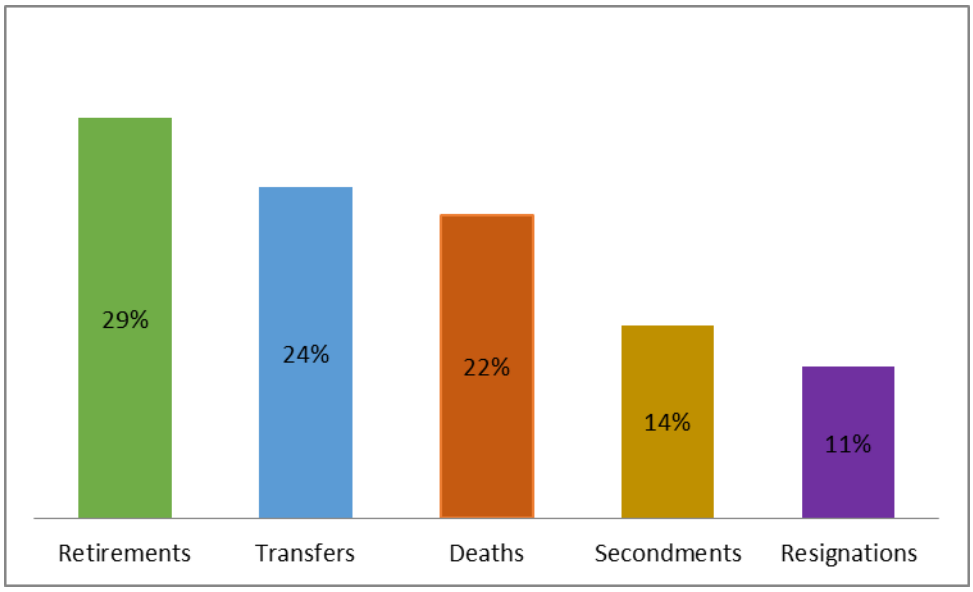

Figure 7: Challenges of knowledge retention

To further investigate the challenges of knowledge retention which includes retirements, deaths, transfers, resignations and secondments, the researcher conducted documentary review of administrative documents for 2013. The findings from the reviewed documents revealed that there were eight members of staff who retired, three members of staff were transferred, and the total number of the recorded deaths was six and only one member of staff resigned from the College. From the fore going, the major challenge of knowledge retention at Natural Resources Development College was retirements of staff.

Some of the responses from the interviews with the six (6) Senior Managers were as follows:

> *"It is difficult to find right replacements for retired members of staff as a result few staff remain creating gaps in staffing structure. In other words, there is lack of manpower, there is loss of information, knowledge retention loss as staff are retired leading to overload of work to the remaining staff and that reduces the quality of work. Therefore, retirements result in shortage of manpower and experts and the replacement takes time".*

In terms of transfers, one of the interviewees said:

> *"Transfers, though sometimes are necessary, they bring inadequacy of manpower, and increase in errors, loss of productivity, there is overworking of existing staff leading to poor performance due to reduced human resources. They often lead to setbacks in the number of experts, more especially when wrong people are brought as replacements. Therefore, the transferring of members of staff from their departments to another department deprives them of relevant operational knowledge".*

On how the challenge of deaths affected the operations of the departments the Natural Resources Development College, one of the interviewees commented as follows:

> "*It is difficult to find replacements; especially it is difficult to replace certain skills, so there is loss of experienced human resource. Sometimes, the College employs new staff just to fill up the left gaps or engage part time staff with less experience. The loss of knowledge retention results in the loss of productivity and overload, there is vacuum creation and replacements are difficult, thus an overload of work for the remaining staff."*

On how the challenge of secondments affected the operation of the departments at the institution, the following responses were obtained from interviewees:

> *"There is loss of experienced staff, some replacements are not trained and it takes time to replace the staff. Secondments create vacuums in the departments and replacements are difficult".*

When the interviewees were asked how the challenge of resignations affected the operations of their departments, one of them lamented that:

"Crises are created in the departments and it is a big loss of knowledge retention, which in some cases, lead to permanent loss of human resources. A vacuum is created at the institution and replacements are difficult, wrong people are brought to replace the old ones."

4.6 Measures to control challenges of knowledge retention

The study also wanted to investigate the measures that were put in place to address the challenges of knowledge retention such as retirements, transfers, deaths and resignations at the College.

When the interviewees were asked on the control measures on retirements, the following responses were obtained from interviewees:

The follow up interviews with one of senior managers at the College revealed that one of the measures was to write to the Ministry of Agriculture and Livestock under which the College falls on time concerning the replacements of retired staff. In addition, the institution to put retired staff on part time, the institution to ensure that there is smooth transition before a right replacement is found.

When the interviewees were asked on the control measures on deaths, the following responses were obtained from interviewees:

"It was revealed that the institution should introduce and teach the programmes on behavioural change, the institution should ask for replacement on time, the institution should work on documentation processes, the institution should work on documentation procedures, the institution should employ new staff and part time lecturers, the institution should recruit in advance, the institution should request to fill the vacant posts on time and promoting departmental meeting for sharing experiences and skills".

When the interviewees were asked on the control measures on resignations, the following responses were obtained from interviewees:

"The institution should create more motivations, documentation processes, effective communication, revising the college curriculum or syllabus, to employ new staff and part time lecturers and work on replacements".

When the interviewees were asked on the control measures on transfers, the following responses were obtained from interviewees:

"Apply for replacement in advance, documentation processes, documenting procedures, employ part time lecturers, ensure smooth handover, more exchange moments, more recruitment, the institution should work on part time recruitment, the institution should put retired staff on part time, the institution should work on recruitment of new staff, the institution should work on replacements, the institution should request to fill the vacant posts and should train staff on time."

4.7 Summary of respondents' comments

Question 20 was optional which was intended to gain an insight into the understanding of knowledge retention at the Natural Resources Development College by soliciting free comments from members of staff about their awareness, attitudes, knowledge, perceptions and skills in analysing existing knowledge practices. Respondents were asked to give suggestions, opinions, ideas and criticisms about the knowledge retention at the Natural Resources Development College.

The members of staff suggested that the Natural Resources Development College must develop a knowledge retention policy to enhance knowledge retention for operations, train staff in knowledge retention by analysing the existing practices. Some of the respondents suggested that the College should improve the quality of knowledge retention strategies and practices at Natural Resources Development College in general, more especially with the high levels of knowledge lost due to a number of factors. Furthermore, the staff suggested that current recruitment strategies should change by employing qualified staff to replace the staff leaving the organisation due to different causes.

Further, the staff suggested that there was need to develop mentoring programmes and establish knowledge repositories of communities of practice and phased out retirement in knowledge retention practices. Furthermore, they suggested that knowledge retention practices should be made known and understood by all members of staff. Knowledge retention issues should be the responsibility of all levels of staff. Other respondents suggested the need for improved internal networks and the documentation of work procedures and manuals on how to retain the existing knowledge, respectively. In this regard, knowledge retention practices at Natural Resources Development College should be routine activities.

4.8 Summary of findings

This chapter gave a presentation of the research findings. Tables and diagrams were used and interpretations were given. The next chapter will provide a discussion of these findings and a conclusion and recommendations will be drawn based on the discussion.

CHAPTER FIVE
DISCUSSION OF FINDINGS

5.0 Overview

The discussions are presented according to the themes of the objectives of the study and sub-problems posed as part of the research questions in section 1.5 and 1.6 of chapter one. The general purpose of the study was to investigate current practices of knowledge retention at the Natural Resources Development College, problems and challenges affecting knowledge retention. The objectives of the study are:

1. To identify the type of knowledge being retained at NRDC;
2. To establish the extent to which knowledge is being retained at NRDC;
3. To identify tools and methods used for knowledge retention at NRDC;
4. To identify the strategies for knowledge retention at NRDC; and
5. To establish the challenges of knowledge retention practices at NRDC.

The discussion of the salient points is based on the questionnaire analysis, semi-structured interviews with selected stakeholders such as those in administration and heads of departments. Further, a review of the literature related to knowledge retention was conducted so as to help to investigate current knowledge retention strategies and practices was carried out.

5.1 Type of Knowledge Retained

Knowledge is captured and retained so that it will be reused when necessary for the benefit of the organisation that produces it. Explicit knowledge retained at NRDC is in the form of staff records; students' records; financial records; audits reports; monthly and annual reports.

The study established that explicit knowledge was largely retained by staff at Natural Resources and Development College as compared to tacit knowledge. This situation could have arisen due to lack of well-defined knowledge retention policy at the College. Therefore, both personalised (tacit) and codified (explicit) knowledge constitutes what is regarded as organisation knowledge. Therefore, tacit knowledge and explicit knowledge complement each other as a result NRDC should come up with strategies to retain both such knowledge. In order to retain tacit knowledge

should be converted into explicit knowledge, which should include any formal identified routines, processes, work manuals and documents that constitute declarative knowledge. Such knowledge aids the performance of employees in order to achieve efficient and effective operations. These research findings are similar to the findings of the study by Dewah (2012) who stated that the importance of either type of knowledge varied with interviewees (managers). Some managers viewed tacit knowledge as more important than explicit knowledge and vice versa. The study argued that tacit and explicit knowledge complement each other and therefore organisations should came up with strategies to retain such knowledge. For instance, Head of news and current Affairs (Botswana) indicated that both types of knowledge were important in the broadcasting organisation since they relied on "tangible facts that can be proven or seen and also brainstorm sessions where people use tacit knowledge for example news and short ideas." However, the Chief Engineer (Radio and TV Transmitter) argued that "explicit knowledge is more important because we keep it and can be reused whereas tacit is kept by an individual and if he goes he leaves with it". The head of procurement with another organisation argued that "tacit knowledge is very important since quick decisions need to be made without reference to documents of which might be time consuming". Finally all the three human Resources managers in the Dewah (2012) study indicated that explicit knowledge was more important in personnel management and therefore need to be properly managed and retained. In the human resources sections explicit knowledge was found to be important because it is easy to make reference to it. There is continuity when you refer to recorded information and it is difficult to deal with something which is not on paper. It is clear why the human resources sections rely on documentation for decision making processes.

Since knowledge retained at NRDC is largely explicit, this implies that staff at the institution will be able to learn from the past experiences and no need of continually reinventing the wheel because the appropriate knowledge residing within NRDC as it will be easily accessible to the right people to enable them to do their work. This is true in the administrative departments of NRDC such as procurement, accounts, human resources and transport. This implies that explicit knowledge in form of staff records, financial records, audit reports, monthly and annual reports are all retained so that they will be reused in future. Basically, the recurrent nature of routine problems prompts these departments to carefully manage their explicit knowledge for the purposes of making reference to such records.

The findings of this study are supported by McElroy (2002) who has argued that explicit knowledge is easy to share. Since explicit knowledge is codified, many find it easy to transfer and it is regarded as leaky and migratory. Therefore, it is dependent upon an organisation to gather and retain this knowledge through various ways at work; such as meetings, workshops and seminars or in tutor and apprentice roles. In this way, Nonaka and Takeuchi (1995) argue that there will be little risk that the know-how of the company will leave at the same time of the employees' retirement.

5.2 Tools and methods used for knowledge retention

When the respondents were asked to indicate the knowledge storage media that was used to store knowledge at the College, the study revealed that the majority of the staff were using paper records. This finding shows how widely paper records are used as tools for knowledge retention at the Natural Resources Development College. This implies that the paper records were the most important and major knowledge storage media used at NRDC. This was followed by 24% of the respondents who were using flash disks. The use of audio tapes as knowledge storage media was not so popular at NRDC. This could be attributed to the fact that paper is easier to use and cheaper compared with other storage media.

The findings of this study on the tools and methods used for knowledge storage at the Natural Resources Development College are in line with Hernandez (2006). He pointed out that knowledge had to be captured and stored in organisations' repositories such as databases, documents, software and embedding it in processes, products and services thus transferring the existing knowledge around in the organisation.

According to Turban, Mclean and Wetherbe (2004), the use of modern information technologies is intended to help an organisation cope with turnover, downsizing by making the expertise of the organisation's human capital widely accessible; build to maintain a well-informed productive workforce, help large organisations provide a consistent level of customer service and also help organisations retain the knowledge of departing employees.

When the respondents were asked to indicate the type of ICTs they were using to do their daily works at NRDC, Most of the staff (respondents) reported that they were using computers, while others were using Intranet to access electronic mail, telephone or cell phone, websites and

discussions forums, respectively. However, it was not surprising to find out that virtual conference rooms, twitter, blogs and knowledge directories were among those that were insignificantly used by the staff at the Natural Resources Development College because they were introduced recently and more popular among younger members of staff. In addition, the most common use of websites was browsing or searching for information on topics of interest

The findings of the study also agree with Hansen, Nohria and Tierney (1999) who have pointed out that computers are used to share knowledge through person to person contacts and this is called personalisation strategy. Further, the chief purpose of computers at some organisations is to help people communicate knowledge, not to store it. In a study conducted by Mavodza and Ngulube (2011), the majority, 64% of the respondents indicated that the knowledge they needed to perform their job functions was retained in their computer or workstations. This is an indication that computers can be utilised to transfer knowledge as well as to store knowledge. Hansen, Nohria and Tierney (1999) have pointed out that the rise of networked computers has made it possible to codify, store and share certain kinds of knowledge more easily and cheaply than ever before. Therefore, it can be argued that the use of technology in Higher Learning Institutions provides an avenue through which knowledge amongst workers can be shared effectively and efficiently.

Probing further, the respondents were asked to indicate the methods that were used to retain organisational knowledge. It was discovered that at the Natural Resources Development College, documentation was the most common method that was used to retain organisational knowledge. This was followed by mentoring of new employees and archiving of the organisational knowledge. The documented explicit (codified) knowledge was mainly found at NRDC. NRDC being a higher learning institution has a library. This means that the NRDC library held published material that could be consulted by all the members of staff such as a lecturer using the library in order to prepare for a good lecture as well as a presentation.

The findings of this study are supported by Levy (2011), who have reported that successful knowledge retention can be achieved through documenting, integrating knowledge back into the organisation but special care being dedicated to retaining best practices.

Similarly, Hernandez (2006) argues that organisations need to document and retain the knowledge of their key personnel and subject matter experts, manage this intellectual capital before it simply walks out of the door resulting in organisations losing valuable intellectual capital, namely knowledge, talent, experience and expertise.

Mentoring was the second common method that was used to retain organisational knowledge at NRDC. This means that senior employees are transferring their knowledge, wisdom, specific insights and skills to their juniors within a short space of time such that when the experienced employees leave the organisations or die; the organisation's substantive practice, knowledge, history, stories and culture are preserved. Mentors gently transfer subtle, private skills and experiences to others as role-models thus introducing mentors to their network in an informal setting. Therefore, the impact of attrition could be reduced by making use of appropriate knowledge retention approaches to capture knowledge and information in organisations such as the Natural Resources Development College.

5.3 Knowledge retention strategies and practices

The study probed the available knowledge retention strategies and practices at Natural Resources Development College. The findings of the study revealed that the majority of the staff (respondents) agreed that they had knowledge management and retention strategies in their respective departments.

The respondents were asked to state the specific knowledge management and retention strategies that was used at NRDC. It was confirmed by the majority (67%) of the respondents that the common knowledge retention strategy that was used at NRDC was to replace the departing employees regularly with qualified persons. The implication of replacing departing employees with qualified persons is that, the recruitment process attracts a cost to the college. These results are contrary to Kelleher (2006) who points out that even if organisations were to recruit new employees they could not replace the experiences or the knowledge of retirees unless it had been documented. In this regard, this knowledge from the departing employees has to be captured and stored in organisations' repositories such as databases, documents, software and embedding it in processes, products and services thus transferring the existing knowledge around in the organisation.

Although the respondents had earlier on claimed to have knowledge management and retention strategies, the study shows that 33% of the respondents were not aware of the knowledge management and retention strategies that were available at NRDC. The fact that 33% of the respondents denied having any kind of knowledge retention was an indication that knowledge retention strategies were not yet formally made as an integral part of knowledge management tools at NRDC.

A follow up observation at NRDC revealed that the available knowledge retention strategies were replacing the departed employees with the qualified personnel, documenting knowledge on paper and computers, producing practical hand-outs and modules, organising workshops for students and staff to gain knowledge and skills, keeping of records, manuals, mentorship and orientation of new staff. These findings are in line with Thilmany, (2008) who states that knowledge retention strategies can keep employees' workplace-acquired wisdom from walking out the door when they retire. In this regard, organisations need to establish ways to retain employee's know-how and best practices so that the knowledge could be passed on to future workers and replacements who should regain the on-the-job knowledge the ex-employees spent years accumulating.

In a follow up question, the respondents were also asked whether the Natural Resources Development College was working with other higher learning institutions in any knowledge management practices. This study reveals that the Natural Resources Development College was collaborating with other institutions of higher learning in knowledge management practices through joint research projects and seminars/workshops respectively. Since NRDC collaborates with other higher learning institution in knowledge management practices by having joint research and seminars/ workshops, this means that the staff as well as lecturers would acquire new skills and knowledge which is critical in the service delivery for the institution. Furthermore, the College was involved in other collaborative ventures with other higher learning institutions in knowledge management practices through exchange of staff and information through peer reviews presentation of knowledge with colleagues in the same field. These findings agreed with Albers (2009) who found that communities of practice working on company projects and initiatives share both tacit and explicit knowledge by taking information and materials and refining them to a point where they can become corporate positions on topics.

Therefore, collaborations with subject master experts have abilities to answer questions, provide historical perspective and offer solutions.

Probing further, the study set out to investigate whether NRDC required a knowledge retention policy, According to the findings, the majority (59%) of the respondents acknowledged the need for a knowledge retention policy, while 41% of the respondents said no. This implies that the majority of the members of staff appreciate the importance of having a knowledge retention policy in place at NRDC. This also means therefore, that a policy will serve as a guideline in all issues to do with knowledge retention at the institution. This support for the need to develop a knowledge retention policy for NRDC is in line with Wamundila and Ngulube, (2011) who stated that the limited documentation available on how work was carried out in the various operations at the University of Zambia affect operational capability of the institutions. In other words, there is need to put a mechanism in place to provide a platform on which operational knowledge within NRDC could be acquired. It was clear that very few work processes and tasks were documented. Therefore, NRDC can be said to share similar problems with other universities and colleges in Africa with regard to non-availability of well-defined knowledge retention policies and strategies in place to mitigate knowledge loss.

5.4 Managers role in promoting knowledge retention

In the current knowledge economy, managers and knowledge workers work in a rapidly evolving technical and scientific environment. They gain experiential knowledge, only some of which is formally captured and shared.

Inevitably, many are leaving without passing on valuable knowledge, experience and expertise to future generations. In many instances, successors only discover that they are missing key information through mistakes, unexpected quality defects or major costly disruptions.

The findings of this study showed that managers at the Natural Resources Development College played different roles in their attempt to promote knowledge retention. It was discovered that 25% of the managers played their role by encouraging other members of staff at NRDC to share knowledge by holding regular meetings with other staff. This means that sharing of knowledge with other staff within the institution (NRDC) is one of the most prominent knowledge retention strategies. The sharing of knowledge is very cardinal because knowledge must be distributed to

everyone in the organisation. This strong encouragement by managers to share knowledge can be attributed to the fact that they want to avoid some knowledge gaps when other staff leave. This means that managers at NRDC promote knowledge sharing to the members of staff. Knowledge sharing at NRDC ensures that knowledge is retained in the organisation's employees even though the expertise leaves due to attrition. The implication of sharing knowledge is that it helps by building the capacity of its personnel especially those engaged in providing training to a variety of customers and ensure that they provide quality and up to date service delivery. Furthermore, the other strategies that managers used in promoting knowledge retention includes databases, knowledge repositories, invited experts to give lectures, attended informal gatherings, by establishing communities of practice and by appointing mentors respectively.

The findings of this study are in agreement with Antal (2003) who emphasised that once knowledge has been acquired, it must be distributed. If the knowledge remained with the unit or individuals who obtained it, it would be of little use to the organisation. There should be serious commitment from top management to support and promote knowledge retention in organisations, especially higher learning institutions. Knowledge promotion should be embedded in the organisation culture and management support as factors influencing the transfer and knowledge retention. Delong (2004) argued that managers cannot afford to lose knowledge if they expect not only to sustain their current performance levels, but to also improve performance levels through innovation and growth. Business strategists, managers and leaders must therefore urgently address the issue of knowledge retention, which threatens to undermine the evolution of the knowledge economy.

There is a correlation between an organised culture and structure that support learning, sharing, storage and use of knowledge that contributes towards cultivating a culture of knowledge retention. Therefore, managers in organisations such as NRDC should encourage the creation and establishment of resources such as communities of practice and professional networks to encourage the capture and retention of personalised tacit knowledge that is found in individuals.

5.4.1 Reasons for knowledge Retention at NRDC

The findings of this study revealed that the major reason for knowledge retention at Natural Resources Development College was to support management strategic objectives. For a higher learning institution like NRDC this entails that there is smooth operations of the day to day

activities. Furthermore, by supporting management strategic objectives, NRDC is able to meet the institution's core functions of teaching, carrying out research and providing public service. The other reasons cited by the respondents were to enhance quality of service, to enhance productivity, to impart training and to mentor junior colleagues, enhancement of one's career, to earn promotion, to be rewarded, to get recognition and to satisfy self-fulfilment needs were the least reported reasons.

This finding that the reason for knowledge retention at NRDC was to support management strategic objectives is supported by Kruse (2003) and Scalzo (2006) who argued that the loss of organisational knowledge was a menace for efficient and effective operation of an organisation. In other words, such a menace emanates from the understanding that from inception, an organisation acquires its operational knowledge "relevant for its existence." The negative impact therefore is that, if such knowledge was not managed and retained, an organisation stands to lose the knowledge acquired along the way, a threat that would be viewed to have detrimental effects on organisational operations.

In this context, the old adage "Knowledge is power" becomes a critical reason for knowledge retention in organisations such as NRDC because knowledge is the economic engine for any business to run efficiently and effectively. Recognising that the lost knowledge could be a threat to organisational performance is the first important step for knowledge retention in the institution. The design and implementation of effective knowledge transfer and retention strategies will require managers to understand the forms and types of lost knowledge and how they affect the institution. This is supported by Johnston (2005) who states that focusing on the threat of lost knowledge, instead of staff shortages will provide managers with more accurate perspectives on the impact of turnover on the knowledge economy. Furthermore, he broadly defined lost knowledge as the decreased capacity for effective action or decision making in a specific organisational context.

5.5 Challenges of Knowledge Retention Practices

Institutions of higher learning and organisations should realise that in the absence of knowledge retention strategies and practices, they stand to lose their organisational memory, that is, the operational knowledge within employees as well as the organisational operating procedures and related documents. In this regard, the findings of this study established knowledge loss

challenges emanating from staff attrition challenges such as retirements, transfers, deaths, secondments and resignations. The challenges that hindered knowledge retention practices were ranked by the respondents as follows: retirements were reported by 29% of the respondents and transfers were reported by 24% of the respondents. Deaths were reported by 22% of the respondents, secondments were reported by 14%, while resignations were reported as the least by respondents at 11%.

The findings of this study ranked retirements as the most challenging problem at Natural Resources Development College. These findings are consistent with Stovel and Bontis (2002) who have pointed out that most organisations are faced with attrition challenges comprising of retirements, resignations, deaths and general movement of young workforce, generally referred to as employee mobility and turnover. These challenges (retirements, resignations and deaths) have been identified as agents for knowledge loss, which cause inability to perform organisational operations efficiently and effectively. Those retiring can severely affect and erode the knowledge base of an organisation; thus practical wisdom, accumulated knowledge, know-how and intuitions all gained through years of extensive experience may easily get lost. Similarly, Johnston (2005) states that the challenges of knowledge retention are being driven by two forces that are shaping today's workforce namely an aging population and the increasing complexity of knowledge needed in technologically advanced societies. Therefore, these two forces cause an acute skills shortage.

Follow-up interviews with the key informants at Natural Resources Development College revealed that knowledge retention affected the operations of the sections, departments and the organisation as a whole. One of the interviewees lamented that it was difficult to find right replacements for retired members of staff. As a result, there was an acute lack of manpower, loss of information and overload of work to the remaining staff and that affected the quality of work. Therefore, retirements resulted in the shortage of manpower and experts and the replacements were taking a long time. Accordingly, recognising that lost knowledge through impending retirements might be a threat to business performance is a critical first step in addressing this phenomenon.

In terms of transfers that were taking place at NRDC, the interviewees reported that it deprived the affected departments of relevant operational knowledge. Transferring a member of staff has a

negative impact on the affected department; especially if the tacit knowledge which is kept in an individual's mind is lost completely from the section, department and institution. For example, if a lecturer who has been teaching second year students was transferred to another institution, it might take time for the students to get used to the teaching style of a new lecturer, which in a long run would even affect the students' performance.

Further, the interviewees reported that due to deaths it was difficult to replace certain skills that were embedded in the member of staff that left the College. The consequence of losing such experienced human resource was that the new staff will have less experience, thereby resulting in overload and the loss of productivity to the institution.

Commenting on resignations and secondments that were taking place at the Natural Resources Development College, some of the staff interviewed reported that crises were created in the departments and the institution as a whole. They reported that once the resignations took place at the College, a vacuum was created at the institution and replacements were difficult and sometimes wrong people were brought in to replace the retirees. Further, they reported that some replacements were not trained and it took time to replace the staff.

According to Delong (2004), lost knowledge through retirements, deaths, transfers, secondments and resignations can have an impact on organisational strategy and performance. He summarised the impact of lost knowledge in five major areas such as reduced capacity to innovate; ability to pursue growth strategies is threatened; reduced efficiency undermines low-cost strategies; losing knowledge can give competitors an advantage; and losing certain knowledge at the wrong time increases vulnerability. Therefore, organisations need to identify these situations ahead of time as this would assist them in focusing and aligning their knowledge retention initiatives, which would have the greatest impact on long-term business performance and sustainability.

In the follow up interview with the key informants, which asked them to state the type of measures that were put in place at the Natural Resources Development College to address the challenges of knowledge retention such as retirements, transfers, deaths, secondments and resignations at the College, the interviewees revealed that the College was always on time to write to the then Ministry of Agriculture and Livestock under which the College falls to advertise for the suitable replacements whenever there were vacancies resulting from retirements, deaths,

transfers, resignations and secondments. According to the interviewees, the other measures that were put in place to curb the challenges brought about through deaths were introduction of programmes such as safe sex among the staff to target behaviour change, put in place motivational mechanisms and job security measures to attract qualified and experienced workers in order to curb brain drain caused by resignations in the College. In addition transfers were coordinated so that there was smooth movements of staff and handovers within and outside the College.

These findings are consistent with Delong (2004) who states that managers cannot afford to lose knowledge if they expect not only to sustain their current performance levels, but to also improve performance levels through innovation and growth. Business strategists, managers and leaders must therefore urgently address the issue of knowledge retention, which threatens to undermine the evolution of the knowledge economy. Therefore, if no measures to curb the scourge of brain drain are put in place, the result would be continued declines in academic standards, dwindling research output and perpetuated staff attritions at the Natural Resources Development College.

The challenge facing many organisations, both private and public, was not only the loss of some of their most experienced employees, but also the fact that many of these knowledge workers and managers were taking with them new types of critical expertise and experiential knowledge that did not exist a generation ago. In the new economy, organisations were facing not only a labour shortage, but also a knowledge shortage. As for Delong (2004) and Johnston (2005) the problem for management was not only one of a headcount; it was a question of retaining sophisticated, context-dependent knowledge that resided with an employee who was leaving the organisation.

5.6 Summary of the discussion

The study established that explicit knowledge was largely retained by staff at Natural Resources Development College as compared to (tacit) tacit knowledge

The tools and methods used for knowledge storage at the Natural Resources Development College were organisations' repositories such as databases, documents, software and embedding it in processes, products and services thus transferring the existing knowledge around the organisation.

In terms of Information and Communication Technologies (ICTs), it was discovered that computers were used to share knowledge through person to person contacts and this is called personalisation strategy. The chief purpose of computers at the Natural Resources Development College was to help people communicate knowledge. The most accessible and used ICTs were intranet, email, telephone, cell phones virtual conference rooms, blogs, twitter, websites, discussion forums and knowledge directories. Therefore, it can be argued that the use of technology in Higher Learning Institutions provides an avenue through which knowledge amongst workers could be shared effectively and efficiently.

The research has revealed that the Natural Resources Development College has knowledge retention strategies in place. Further, Managers at the Natural Resources Development College play different roles in their attempt to promote knowledge retention. One of the ways was through encouraging other members of staff at NRDC to share knowledge by holding regular meetings with other staff. Staff were also encouraged to use databases. To this effect, business strategists, managers and leaders must therefore urgently address the issue of knowledge retention, which threatens to undermine the evolution of the knowledge economy. Therefore, managers in organisations such as NRDC should in some way encourage the creation and establishment of resources such as communities of practice and professional networks to encourage the capture and retention of personalised tacit knowledge that is found in individuals.

The major reason for knowledge retention at the Natural Resources Development College was to support management strategic objectives. If such knowledge was not managed and retained, an organisation stands to lose the knowledge acquired along the way, a threat that would be viewed to have detrimental effects on organisational operations. In order to promote knowledge retention, the Natural Resources Development College was collaborating with other institutions of higher learning in knowledge management practices through joint research projects and joint seminars/workshops, respectively. The major methods used for knowledge retention were documentation and mentoring of new employees. Therefore, the impact of attrition could be reduced by making use of appropriate knowledge retention approaches to capture knowledge and information in organisations such as the Natural Resources Development College.

The Natural Resources Development College was facing a number of challenges related to knowledge retention. Among the major challenges was that organisational knowledge was

vulnerable due to retirements, deaths, resignations, transfers and secondments. So capturing, disseminating and preserving such knowledge should be a top priority in order to retain it. The lost knowledge through retirements, deaths, transfers, secondments and resignations could have an impact on organisational strategy and performance. The impact would be seen in reduced capacity to innovate; ability to pursue growth strategies is threatened; reduced efficiency undermines low-cost strategies; losing knowledge can give competitors an advantage; and losing certain knowledge at the wrong time increases vulnerability. Furthermore, affect the quality of work because replacements take time to implement, deaths of staff resulting into understaffing and creating vacuums which are difficult to replace, uncoordinated staff transfers leading to loss of productivity, overworking of remaining staff and poor performance of staff in the affected departments and secondments resulting in loss of experienced staff and making it difficult to replace certain knowledge and skills because some replacements were not trained.

The research also revealed that the Natural Resources Development College had put in place certain measures to address the challenges of retirements, deaths, resignations, transfers and secondments. It was established that the College retained retired staff on contracts until right replacements were found to ensure smooth transitions. In terms of deaths, it was suggested that the College must introduce programmes on safe sex among the staff to target behavioural change. In addition, put in place safety measures to prevent fatal accidents at work. In order to stop brain drain due to resignations, it was suggested that the College should put in place motivational mechanisms and job security measures to attract qualified and experienced workers. Transfers and secondments were to be well planned in advance so that it gave room for new employees to be mentored by those being transferred or seconded to other institutions.

Finally, the research found that there was need to improve the quality of knowledge retention strategies and practices at the Natural Resources Development College in general and more especially with the high levels of knowledge lost due to a number of factors. It was also revealed that the College should improve their recruitment strategies. Further, the study found that there was need for improved internal networks, develop mentoring programmes, there should be an establishment of knowledge repositories, community of practice and phased out retirements.

CHAPTER SIX
CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The study was carried out to investigate knowledge retention strategies and practices at the Natural Resources Development College. The findings of the study revealed that knowledge retention strategies and practices were present at the Natural Resources Development College. These available knowledge retention strategies and practices were the ones that were used by the College to direct programmes and activities in order to meet its strategic objectives. The importance of having knowledge retention strategies in an institution leads to better education service delivery due to better performance by employees, better employees' satisfaction, and teamwork.

The study revealed that both tacit and explicit knowledge was retained at the Natural Resources Development College. However, it was the explicit knowledge which was produced in larger quantities in comparison to tacit knowledge. Such knowledge needs to be captured, processed and stored in form of explicit knowledge for it to be retained for future use in the College. Further, it was established that computers and paper were the most popular storage tools used for retaining knowledge at the Natural Resources Development College. The paper records facilitate knowledge retention strategies because they document work procedures and processes. The explicit knowledge at NRDC was produced in form of modules, lecture notes and syllabuses used as a mode of instruction when conducting lectures to students. Computers, on the other hand, were used for knowledge retention through capturing, processing, storage and knowledge sharing.

The study discovered that the managers played their role in knowledge retention by encouraging other members of staff at NRDC to share knowledge by holding regular meetings with other staff. In this regards, managers in organisations such as NRDC encourage the creation and establishment of resources such as communities of practice and professional networks to encourage the capture and retention of personalised tacit knowledge that is found in individuals. However, the study revealed that serious commitment was lacking from the top management to

Support and promote knowledge retention at the College. Knowledge retention promotion should be embedded in the organisation culture and management support as factors influencing the transfer and knowledge retention.

The study revealed that there was need to develop an all-embracing knowledge retention policy for NRDC. It was clearly noted that very few work processes and tasks were documented. Workforce planning was not practiced and skills as well as competency inventories were lacking. This was evident in that the majority of the respondents were not aware of the exact knowledge retention strategies and practices at the College. This was a clear exposure of inadequacies of the knowledge retention strategies and practices that were being used at NRDC. In order to implement effective knowledge retention strategy and practices, the entire knowledge management system must be formalised as an integral part of management strategy. The conclusion drawn from the study is that NRDC lacks proper knowledge retention strategies and practices in place that could help to capture and retain critical knowledge that was acquired within the institution.

In terms of joint projects with other institutions, it was revealed that the Natural Resources Development College was working with other higher learning institutions in the area of knowledge management practices. The areas of collaborations were joint research projects, joint seminars/workshops, through exchange of staff and the exchange of information, peer reviews through presentation of knowledge with colleagues in the same field. Further, it was discovered that at the Natural Resources Development College, documentation was the most common method to retain organisational knowledge. Mentoring of new employees was ranked second, while archiving the organisational knowledge was third. The other least used methods were to invite retirees as consultants and to conduct interviews with retirees and have their experiences recorded.

The study findings revealed that knowledge captured and stored in organisations' repositories such as databases, documents, software and embedding it in processes, products and services thus transferring the existing knowledge around in the organisation. The study has also established that computers and paper records are the most popular tool used by members of staff for carrying out their daily operations. The paper records facilitate knowledge retention strategies because of the documentation of work procedures and process.

In terms of challenges, the findings of this study ranked retirements as the most challenging problem at the Natural Resources Development College. The other challenges of knowledge retention practices were as follows: transfers, deaths, secondments, meanwhile resignations were reported as the least of the challenges. To this effect, institutions of higher learning and organisations should realise that in the absence of knowledge retention and management practices, they stand to lose their organisational memory, that is, the operational knowledge within employees as well as the organisational operating procedures and related documents. The organisations need to identify these situations ahead of time as this would assist them in focusing and aligning their knowledge retention initiatives, which would have the greatest impact on long-term business performance and sustainability. Therefore, the existence of knowledge retention practices and strategies are vital aspects of knowledge management in any given institution. This is because it facilitates the flow of knowledge throughout an organisation from those that possess it to those that need it for the successful completion of various tasks to add value to their work or for the successful achievement of organisational objectives.

In order to address the identified challenges, the College should advertise suitable replacements whenever there were vacancies resulting from retirements, deaths, transfers, resignations and secondments. Further, the other measures taken were the introduction of motivational mechanisms and job security measures to attract qualified and experienced workers in order to curb brain drain through resignations in the College and coordinate transfers so that there was a smooth movements of staff and handovers within and outside the College.

The study's conclusions are that despite the existence of some form of knowledge retention activities NRDC lacks proper knowledge retention strategies in place in order to capture and retain critical knowledge that is acquired within the institution. While there is mentoring of juniors, the mentoring programmes are lacking in substance. Furthermore, there are no communities of practice and knowledge sharing among persons with common interest in specific field and discipline suffers as a result. Therefore, the management at NRDC should encourage the establishment of knowledge retention strategies such as communities of practice, mentoring programme in utilisation of experienced staff, especially those nearing retirement and subject matter experts to retain personalised knowledge in the organisation are a must if the organisation

is to succeed. All in all, the study revealed that NRDC requires a well-defined knowledge retention policy in place that will address knowledge retention practices at the institution.

6.2 Recommendations

Taking into account the results of the study, the identification of the main features characterising the knowledge retention throughout the world, a number of recommendations are made to the College Management. The study clearly shows that:

1. The Natural Resources Development College produces a large portion of explicit knowledge than tacit knowledge. Accordingly, it is recommended that tacit knowledge has to be retained and stored in a form of the organisation's repositories such as databases, documents, software and embedding it in processes, products and services thus transferring the existing knowledge around in the organisation for easy access and retrieval.

2. The Natural Resources Development College lacks well defined knowledge retention policy that spells out strategies and practices of knowledge retention. It is recommended that the College should develop a knowledge retention policy.

3. The study revealed that the Natural Resources Development College was working with other higher learning institutions in knowledge retention strategies and practices. It is recommended that NRDC should improve the levels of cooperation with other institutions of higher learning in the nation, region, continent and worldwide collaboration that can lead to the creation, sharing and retention of critical knowledge which NRDC may need for future use.

4. The study established knowledge loss challenges emanating from staff attrition such as retirements, transfers, deaths, resignations and secondments. It is recommended that NRDC management identify these situations ahead of time and put in place mitigation strategies to address the identified challenges such having a recruitment plan in place.

6.3 Further Research

This study on knowledge retention that investigated the strategies and practices is not exhaustive. This was only a case study of the Natural Resources Development College; another similar study should to be carried out on a large scale on the knowledge retention strategies and practices in Agricultural colleges in Zambia. However, the study has brought to the fore several issues that require further research that would provide in-depth understanding of the issues critical to the knowledge retention in Zambia.

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Appendix 1: Questionnaire

THE UNIVERSITY OF ZAMBIA

SCHOOL OF EDUCATION

DEPARTMENT OF LIBRARY AND INFORMATION STUDIES

DIRECTORATE OF GRADUATE AND RESEARCH STUDIES

RESEARCH TOPIC

KNOWLEDGE RETENTION AT THE NATURAL RESOURCES DEVELOPMENT COLLEGE (NRDC): AN INVESTIGATION OF CURRENT PRACTICES.

INTRODUCTION

Dear respondent

I am a postgraduate student carrying out the above research in partial fulfilment for the award of Master of Library and Information Studies (MLIS).The information collected will be used for academic purposes only and confidentiality will be observed.

Please answer as objectively and sincerely as possible.

Your cooperation will be highly appreciated.

INSTRUCTIONS

- Please just answer by ticking or writing in the spaces provided
- ( ) the response that suits your view.
- DO NOT tamper with the 'OFFICIAL USE ONLY' column.
- DO NOT write your name or any other identity on this questionnaire.

Serial no…….

SECTION A: BACKGROUND DATA.

1. Gender

(a). Male [ ]

(b). Female [ ]

2. Age

(a). 15-24 Years [ ]

(b). 25-34 Years [ ]

(c). 35-44 Years [ ]

(d). 45-54 Years [ ]

(e). 55 Years and Above [ ]

3. Educational Level

(a). Certificate [ ]

(b). Diploma [ ]

(c). Bachelor Degree [ ]

(d). Masters [ ]

(e). Postgraduate diploma [ ]

(f). Doctorate [ ]

(g). Other (please specify)……

4. How long have you been working for the Natural Resources Development College?

(a). Less than 5 years [ ]

(b). 5-10 years [ ]

(c). 11-15 years [ ]

(d). 16-20 years [ ]

(e). 21-25 years [ ]

(f). 26 years or more [ ]

5. What department do you belong to? (Please tick from the following).

(a). Agriculture Education and Extension [ ]

(b). Basic Sciences and Fisheries [ ]

(c). Accounts [ ]

(d). Agricultural Business Management [ ]

(e). Food and Nutrition [ ]

(f). Crop Science [ ]

(g). Water Engineering [ ]

(h). Animal Science [ ]

(i). Crop production [ ]

(j). Administration [ ]

6. What is your area of specialization?

(a). Animal Science [ ]

(b). Crop Science [ ]

(c). Education and Extension [ ]

(d). Agricultural Business Management [ ]

(e). Food and Nutrition [ ]

(f). Basic Science and Fisheries [ ]

(g). Agricultural Engineering [ ]

(h). Water Engineering [ ]

(i). Other (please specify) ……

SECTION B: KNOWLEDGE RETENTION

7. What type of knowledge is produced at NRDC?

(a). Explicit knowledge [ ]

(b). Tacit knowledge [ ]

(c). None [ ]

8. How is knowledge produced at NRDC retained? (Please tick these that apply)

(a). Staff about to retire teaching employees on critical knowledge [ ]

(b). Recording the staff due for retirement on video/audio tapes [ ]

(c). In organization archives [ ]

(d). Annual Reports [ ]

(e). Database [ ]

(f). Local Area network (server) [ ]

(g). Other (please specify)……..

9. Do you have knowledge retention strategies and practices at NRDC?

(a). Yes [ ]

(b). No [ ]

10. If yes to question (9) explain briefly?

……..

…….

……

11. What roles do managers play in promoting knowledge retention in your organization? (Please tick those that apply).

(a).Establishing communities of practice [ ]

(b). Encouraging staff to share knowledge with co-workers [ ]

(c). To attend informal gatherings where knowledge is being shared [ ]

(d). Appointing mentors [ ]

(e). Regular meetings with other staff [ ]

(f). Use of databases [ ]

(g). Inviting experts to give lecturers [ ]

(h). Use of Information/Knowledge repositories [ ]

(i). None [ ]

12. Which of the following do you consider as reasons for knowledge retention in your organization? (Please tick all applicable).

(a). To get recognition [ ]

(b). To be rewarded [ ]

(c). To satisfy self-fulfillment needs [ ]

(d). To support management strategic objectives [ ]

(e). To enhance my career [ ]

(f). To mentor junior colleagues [ ]

(g). To enhance productivity [ ]

(h). To enhance quality of service [ ]

(i). To impart training [ ]

(j). For promotion [ ]

13. In as far as you know does your organization work with other higher learning institution in any of the following knowledge management practices? (Please tick all applicable)

(a). Joint research projects [ ]

(b). Joint seminars/workshops [ ]

(c). Exchange of staff [ ]

(d). Exchange of information peer reviews [ ]

(e). Other (please specify)……

SECTION C: TOOLS AND METHODS FOR KNOWLEDGE RETENTION

14. Which of the following is used as a method of retaining organizational knowledge? (Please tick all applicable)

(a). Documentations processes [ ]

(b). Interviewing retirees and recording their experiences [ ]

(c). Mentoring new/younger talent employees [ ]

(d). Archive the knowledge [ ]

(e).Retirees are invited as consultants [ ]

(f).Other please specify.....

15. Which of the following is utilized for knowledge storage in your organization? (Please tick all applicable?

(a). Databases [ ]

(b). Lessons-learned archives [ ]

(c). Paper records [ ]

(d). Audio tapes [ ]

(e).Flashdisk

(f). Other (Please specify)……..

16. Which of the following Information and Communication Technologies (ICTs) do you have access to in your organization for daily operations? (Please tick all applicable).

(a). Intranet/electronic mail [ ]

(b). Virtual conference rooms [ ]

(c). Blogs [ ]

(d). Twitter [ ]

(e). Computers [ ]

(f). Telephone/Cellphone [ ]

(g). Websites [ ]

(h). Discussion forums [ ]

(i). Knowledge directories [ ]

(j). Groupware [ ]

(k). Library database [ ]

(l). Facebook [ ]

17. Is the internet freely accessible to every employee in your organization?

(a). Yes [ ]

(b). No [ ]

18. If yes how often do you access the internet?

(a). Once in a day [ ]

(b). Twice a day [ ]

(c). 2 to 5 times a day [ ]

(d). Unlimited access [ ]

(e). Infrequent access [ ]

19. Please state methods for retaining the knowledge that may be lost.

……

……

……

SECTION D: CHALLENGES OF KNOWLEDGE RETENTION PRACTICES

20. Which of the following turnover and mobility challenges has your department ever faced?

Challenges

	Yes	No
Retirements	[ ]	[ ]
Deaths	[ ]	[ ]
Resignations	[ ]	[ ]
Transfers	[ ]	[ ]
Secondments	[ ]	[ ]

21. What measures have you put in place to address the acknowledged challenges?

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.....

22. What do you suggest should be done to improve the quality of knowledge retention strategies and practices at the institution in general especially with these high levels of knowledge lost due to a number of factors?

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…….

Thank you for your co-operation and time

Appendix 2: Interview Schedule with Senior Management

TOPIC: KNOWLEDGE RETENTION AT THE NATURAL RESOURCES DEVELOPMENT COLLEGE: AN INVESTIGATION OF CURRENT PRACTICES

AIM OF THE RESEARCH

To investigate knowledge retention practices at NRDC.

RESEARCH OBJECTIVES

1. To identify the type of knowledge being retained at NRDC;
2. To establish the extent to which knowledge is being produced at NRDC
3. To identify the tools and methods for knowledge retention at NRDC
4. To identify the strategies for knowledge retention at NRDC.
5. To establish the challenges of knowledge retention practices at NRDC

SECTION A: BACKGROUND INFORMATION

1. Date of interview…….
2. Place of interview……
3. Your job designation/position……
4. Department/Section……
5. What is your highest level of education?.....
6. How long have you worked for your organisation?.....

SECTION B: KNOWLEDGE RETENTION

7. How do you capture and retain knowledge in your organisation?

8. Do you think knowledge sharing assists in retaining knowledge in the organisation? If so how?

9. Are employees motivated by management to share knowledge and understand the benefits of knowledge retention activities?

SECTION C: TOOLS AND METHODS FOR KNOWLEDGE RETENTION

10. What method does HRD use in retaining and capturing retiree's know-how and expertise so that the information can be passed on to current and future workers?

11. Of those who left the organisation is there anyone who was interviewed by management in order to capture their knowledge? (Please list as many as you can).

12. State your recommended method that should be used to retain knowledge that may be lost.

13. Are employees free to share knowledge with their juniors, superiors and Colleagues, for example, upward, downward and horizontally?

14. Do employees form or belong to some formal and informal professional groups of their trade?

SECTION C: CHALLENGES OF KNOWLEDGE RETENTION

15. Do you have any challenges in knowledge retention in your institution?

16. As a department what measures have you put in place to address the acknowledged challenges in knowledge retention?

17. Have you ever faced staff attrition challenges? If so, what is the main staff attrition challenges faced and how do they affect your operations? (Probe for any of the following if not mentioned; retirements, deaths, resignations, transfers, secondments).

18. Does the transferring of academic members of staff or an ordinary staff from your

department to another department at NRDC or indeed to another institution deprive your department of relevant operational academic knowledge?

Thank you for your kindness