KNOWLEDGE MANAGEMENT PRACTICES AND THE ROLE OF AN ACADEMIC LIBRARY IN A CHANGING INFORMATION ENVIRONMENT: THE CASE OF THE METROPOLITAN COLLEGE OF NEW YORK

BY

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SUMMARY

Academic library services have now significantly developed and are applying some knowledge management (KM) principles in the provision of library services. KM is about enhancing the use of organizational knowledge through sound practices of KM and organizational learning. KM practices encompass the capture and/ or acquisition of knowledge, its retention and organization, its dissemination and re-use, and responsiveness to the new knowledge.

The focus of this research was on KM principles and practices that may be in place in the Metropolitan College of New York (MCNY) library. The objective was to find out how knowledge was identified, captured, organized and retained in order to enhance performance and improve the quality of service in the library. There is uncertainty about whether the use of KM principles and tools could partly solve the library's approach to improving its quality of service to its community in the modern information environment. KM has been implemented in commercial and business environments towards operational advantages and financial gains and its survival principles and tools may help the library to improve performance and fulfil its mandate.

A mixed methods research methodology encompassing a questionnaire, observation, interviews, and use of institutional documents was used with an action research design for generating new knowledge and understanding of library concerns. The findings of this study indicate that KM concepts were not universally understood at MCNY, and that collaboration of librarians and faculty in creating an educational environment meaningful and relevant for the study programmes offered by the College was essential. The MCNY library practices were not deliberately based on KM but the study established that they were amenable to KM practice. It was making efforts to share know-how so as to reduce duplication of effort, relying on library staff to identify, integrate, acquire, organize internal and external knowledge for the benefit of the whole College. The recommendation was to perform a knowledge inventory. This could help develop appropriate institution-wide policies and practices for proper and well organized methods of integrating work processes, collaborating and sharing (including the efficient use of Web 2.0 platforms), and developing an enabling institutional culture.

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DEDICATION

If we mean to have heroes, statesmen, and philosophers, we should have learned women.

Abigail Adams (1744–1818).

This thesis would be incomplete without mentioning the support and unconditional love given to me by Chrispen Toga my husband, (pillar of strength and friend), my loving daughter Grace Rugare, and my step-son Sean Inzwirashe. My sisters Eunah Makamure, Eddwina Muleya, Seremina Maunde, Tsitsidzashe Chikuri, and Natsai Makanza and brother Wilson Chinoera Gopoza offered encouragement and inspiration throughout the course of this thesis.

In loving memory of my late parents, Mr. T.T. and Mrs. S.T. Gopoza Marongere, for their pride and contentment with this achievement would have been indescribable; and my mother–in-law Mrs. G.P. Mavodza and late father-in-law Mr. T. Toga Mavodza, for their sheer genuine pride to have me for a daughter-in-law.

To all these loving people, this thesis is dedicated.

DECLARATION

I declare that this study, **Knowledge management practices and the role of an academic library in a changing information environment: the case of the Metropolitan College of New York** is my own work and that all the sources I have used or quoted have been indicated and acknowledged by means of complete references. This thesis does not incorporate, without acknowledgement, any material previously submitted for a degree or diploma in any university.

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Signature Date

Judith Mavodza

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ABBREVIATIONS AND ACRONYMS

ACRL	Association of College and Research Libraries
ALA	American Library Association
BLLD	British Library Lending Division
CA	Constructive Action Project
GAELIC	Gauteng and Environs Library Consortia
IFLA	International Federation of Library Associations
ILS	Integrated Library System
IRB	Institutional Review Board
IS/ IT	Information System/ Information Technology
KM	Knowledge Management
LIS	Library and Information Science
MCNY	Metropolitan College of New York
MMR	Mixed Methods Research
NLM	National Library of Malaysia
NyLINK	New York Link organization
OCLC	Online Computer Library Center
OM	Organizational Memory
OULS	Oxford University Library Service
QUAL	Qualitative
QUANT	Quantitative
ROI	Return On Investment
RSS	Real Simple Syndication
RUSA	Reference and User Services Association
TDM	Total Design Method
UNISA	University of South Africa

CHAPTER ONE: INTRODUCTION

> *And I have always had an especially great desire to learn to distinguish the true from the false, in order to see my way clearly in my actions, and to go forward with confidence in my life*
>
> Descartes (1998)

1.0 Introduction

Educational colleges and their libraries are social organizations where workers transform resources for use by consumers for their teaching, research and community service (Townley, 2001). Academic library services have now significantly developed and are applying some knowledge management (KM) principles in the provision of library services (Gandhi, 2004; Pantry and Griffiths, 2003; Rowley, 1999; Singh, 2007). The reason for doing so is to try and meet or anticipate new needs and demands that result from a new information environment. Knowledge is embedded in the processes and documentation as explicit and in the heads of the workers as implicit knowledge. Thus KM in libraries can be defined as:

> not managing or organizing books or journals, searching the internet for clients or arranging the circulation of materials. However, each of the activities can in some way be part of the knowledge management spectrum and process. Knowledge management is about enhancing the use of organizational knowledge through sound practices of knowledge management and organizational learning. Thus knowledge management is a combination of information management, communication and human resources (Trivedi, 2007).

KM requires the use of sophisticated technology, including collaboration tools. Examples include data warehousing and data mining techniques, portals, web mapping tools, social networking mechanisms (Web 2.0), and brainstorming applications. The technology has no ‘walled gardens’ which implies that information can freely flow in and out of the web services (Anderson, 2007a; Benson and Favini, 2006; Coyle, 2007; Patrick and Dotsika, 2007). Web 2.0 technologies such as blogs and wikis, instant messaging (IM) chat,

tagging, real simple syndication (RSS) feeds, Google maps and Google documents, photos and video sharing, social office suites and podcasts are becoming prevalent (Anderson, 2007a; Carpenter and Steiner, 2005; Harris and Lessick, 2007).

The use of Web 2.0 platforms means more personalisation of information by users as they get to choose what they want to have (Benson and Favini, 2006; Green, 2008; Harris and Lessick, 2007). In this environment, librarians encourage the building of institutional communities through the use of the said platforms, for a given college community to interact with the library (Green, 2008). In addition, they interact with other relevant communities of practice to enhance access to resources. The key to all this is communication and collaboration.

The principle behind KM is that knowledge is not an end in itself. According to Williams *et al.*, (2004: 99), "when information and knowledge flow can be captured, organized and made accessible for reuse, there exists the potential for subsequent creation of new knowledge". The use of Web 2.0 (Foo and Ng, 2008; Oberhelman, 2007) tools such as wikis and blogs promote information flow and that is essential in KM practice. Intranets, web portals, groupware, blogs and wikis are ideally designed for these (KM) applications and many libraries have already begun employing them for internal knowledge sharing (Ajiferuke, 2003; Anderson, 2007a; Farkas, 2007; Foo and Ng, 2008; Mphidi and Snyman, 2004; Singh, 2007).

1.1 Background to statement of the problem

The Metropolitan College of New York (MCNY) consists of two schools, the Audrey Cohen School for Human Services and Education and the School for Management. The school follows the founder's purpose-centred education philosophy which gives direction in the way the coursework is designed for the term, including constructive action (CA) learning. CA is a type of action learning which:

> requires the integration of theory in the classroom and practice at the worksite…, a methodology for integrating theory and practice, for joining education and the

worksite, for learning, and for assessment of outcomes (Nufrio and Tietje, 2008: 217).

The academic courses are designed to provide students hands-on experience, based on concepts that relate in some ways to Kolb's theory of experiential learning. Kolb saw learning as a circular process which is a series of experiences with cognitive additions, concrete experience, reflection and observation, abstract concepts and generalizations, and active experimentation (Fatt, 1993; Kolb, 1984). The difference is that the MCNY system is purpose - centred, that is, learning with the purpose of finding a concrete way of solving a practical challenge (Nufrio and Tietje, 2008). All the teaching and learning at MCNY is highly dependent on library support.

This research looked into KM principles that were in use, or that could be adopted to bring together traditional library operations and modern information practices to enhance the quality and value of the library. KM principles as laid out by Davenport and Prusak (1998) are:

- knowledge originates and resides in people's minds;
- identifying key knowledge workers who can be effectively brought together in a fusion;
- knowledge sharing requires trust;
- knowledge sharing must be encouraged and rewarded;
- emphasizing the creative potential inherent in the complexity and diversity of ideas, seeing differences as positive, rather than sources of conflict, and avoiding simple answers to complex questions;
- technology enables new knowledge behaviours;
- management support and resources are essential;
- knowledge initiatives should begin with a pilot programme;
- quantitative and qualitative measurements are needed to evaluate the initiative; and
- knowledge is creative and should be encouraged to develop in unexpected ways.

The study was done in the context of a college that has an Institutional Research and Assessment Office that performs several research projects to support institutional planning, policy making, and decision making. It is the body that is involved in the evaluation, problem identification, action research, and policy analysis. The library supports or complements the activities of the Institutional Research and Assessment Office's role which is institution - wide, but this research is very specific to the library.

1.1.1 The changing library environment

In the library world, rapid technological changes have had the impact of changing the way library service is provided. The way towards achieving the teaching and educational goals of colleges are inadvertently impacted upon. In that case, the skills of the MCNY librarians have to be as relevant to the electronic milieu created by the technological changes as to that of print. Additionally, the concept of ownership of items has become more fluid because of the prevalence of new communication technologies that include social software like blogs and wikis, MySpace, flikr, and collaboration platforms such as Wikipedia. The collection development function of the librarians now consists of deciding which items to provide straightforward access to, besides the traditional services of issuing print publications, to users. One may say that libraries are now expected to build and maintain "knowledge gateways" (Ravi, 2008: 4) and in the process pull together a range of information resources and sources that address the research needs of their communities.

In the new environment, the MCNY library still organizes payment for information resources, other than those which are available free of charge. It remains the appropriate structure through which the College can take decisions about the distribution of budgeted funds for the purchase of information resources (Rowland, 1998). Cataloguing still implies attaching appropriate metadata to information objects, to ensure that users will readily find the correct ones when searching (Dempsey, 2006; Rowland, 1998). Reference work remains central because the task of listening to a user's needs, advising them on the best resources to access, how to access those resources, and how to formulate

their queries for search systems requires individual attention (Abram, 2008; Maponya, 2004). This applies to both e-referencing and face-to-face set-ups.

In this instance, librarians are major participants in information literacy so that library users end up able to locate, access, and use information for their academic and, possibly, individual needs. An example is with the regular classes available to students and faculty in the use of online resources that the MCNY library has access to, such as ebrary (the online database of full-text books), EBSCOhost, Emerald, ProQuest, WilsonWeb and SAGE journals online. Despite the popularity of the internet and the supposed user-friendliness of the World Wide Web, users need more significant guidance in using electronic resources than they did in using a library of print materials (Pantry and Griffiths, 2003). The library must therefore utilize modern technologies in order to expand services, especially as there are documents and resources from both internal and external sources. Subscriptions to specialized databases and library resources require that they be semantically linked so that the documents can easily be retrieved or delivered. Sometimes these linkages make sense to librarians but require instruction to the library users.

The context within which libraries operate is greatly affected by the Internet and the fast changes that accompany it. Anderson (2007a: 195) suggests that "librarians, like any other professional group, must attempt to make sense of these changes within their domain of expertise and engage with the issues, opportunities and challenges raised". According to Rowley (2003: 437):

> the challenge facing library and information professionals is to conceive and articulate the roles for information and knowledge professionals in organisational and societal contexts in which knowledge competence and value creation are tightly coupled.

Librarian functions include managing information (Branin, 2003; Gandhi, 2004; Kifer, 2005). They preserve and make accessible the intellectual and scholarly heritage of an academic community. With the expectations of the library users of the 21st century,

librarians also serve as human portals (Kifer, 2005; Sprague and McNurlin, 2003). They provide access to information (Gandhi, 2004; Pantry and Griffiths, 2003), and do not only teach library users to navigate the information technology terrain, but are an important part of the design and development of information systems, so that information literacy skills instruction becomes embedded in the information resources themselves (Kifer, 2005; Pantry and Griffiths, 2003; Rowley, 2003).

Information literacy is interlinked to teaching and learning, especially as MCNY conforms to the Middle States Commission on Higher Education (the unit of the Middle States Association of Colleges and Schools that accredits degree - granting colleges and universities in the Middle States region, which includes New York) requirements to have all students and faculty information literate. The concept of embedding information literacy into the curriculum rather than teaching it as a separate topic or module is another requirement of the Middle States Commission on Higher Education too.

Librarians are emphasising on information literacy, instruction on effective use of technology and user needs. They therefore need to, according to Lloyd (2003: 91):

> have some understanding of the environmental, temporal and social dimensions of the workplace in order to develop successful information literacy courses that engage students and enable them to develop a level of proficiency that will permit transfer of information literacy skills from an educational to a workplace context.

This is especially important because of the unanswered question that is in the librarians' minds, and expressed by Lloyd (2003: 88) as he asks: "to what extent does learning of information skills in educational institutions mimic workplace contexts and thus make skills transferable?" The MCNY library should proactively answer the question if it is to remain relevant and in a more visible position than the current state.

1.1.2 Research focus

The focus of this research was on how librarians can encourage the use of interactive workspaces offered through library resources, in addition to the traditional services, to

enable knowledge creation (using retained knowledge), and hence, innovation. It also focused on what KM principles are used to identify, capture, organize, and retain knowledge in the library. In profit-making organizations, the result of innovation can be observed by the number of new patents, design modifications of existing products and development of new products. In the college library environment, innovation is observed by the library's ability to provide quality information in a timely manner and the enhanced expertise of librarians in providing new and relevant ways of library service practice (Anderson, 2007b).

The MCNY library operates in a modern information environment where information literacy is encouraged so that researchers can use information for knowledge creation. This view is based on the premise that innovation can be stimulated by exposure to knowledge which has been captured, coded (or organized) and retained for re-use. The context of MCNY was interesting because of the school's emphasis on making teaching and learning relevant to the workplaces of the students. This is in contrast to the past when information skills were specifically directed to bibliographies, how to search by subject, how to find the tools of the field, and how to use them (Branin, 2003; Corral, 1998; Wen, 2005).

At the time of this study, MCNY was using the Blackboard and Moodle course management systems, which can both be used in collaboration with faculty as platforms by the library to reach students, especially as they allow for the incorporation of the popular Google search engine into its interface. The use of such workspaces as Google notebook, and Google docs (which include word processing documents and spreadsheets) is made easier. Adding library instruction and information to the same platform has the potential to enhance interactivity and enable information retention because experience shows that students use Google regularly for their research information needs. This argument supports the need for an institutional policy and a formal structure to how such collaboration can be most effective. This can enhance the availability of quality information from the library at no added cost to the College, at the same time allowing librarians to monitor use and feedback.

In that regard, the discussion that concerns social software in exploring KM practices seems worthy of further investigation, especially as they do not always include extra costs. In reference to the impact of social networking technologies, Harris and Lessick (2007: 32) suggest that:

> not merely a fad, these applications are rapidly gaining adherents as a growing number of libraries and librarians are experimenting with packaging and delivering information in this simple, practical way. In the advent of this brave new paradigm, librarians need to stay current and engaged or risk marginalization.

1.1.3 Definition of terms and concepts

It is important to define the meanings of concepts when doing research because:

> concepts form the basis for describing and explaining phenomena and processes in a field of study. Within the field of information science, many of the concepts used need to be understood in terms of research context, as a variety of meanings can be attached to most concepts (Ikoja-Odongo and Mostert, 2006).

1.1.3.1 Defining academic librarian

According to the U.S. Department of Labor (2009), "Librarians are classified according to the type of library in which they work". This means that a librarian who supports members of an academic community, such as students, researchers and lecturing staff, by managing, organizing, evaluating and disseminating the information they need is an academic librarian. The given definition suits this research since librarians tend to be defined by function.

1.1.3.2 Defining information

The *Visual Thesaurus online* (2008) defines information as a type of cognition and knowledge, the psychological result of perception and learning and reasoning, as well as a collection of facts from which conclusions may be drawn. It is a flow of messages, while knowledge is created by that flow of information anchored in the beliefs and comments of its holder (Nonaka and Takeuchi, 1995:58). It is a collection of facts or data

"organized in a logical, cohesive format for a specific purpose" (Gandhi, 2004: 369). Thus, in this context, information is understood to mean organized data or facts, understood through learning, experience, or instruction.

1.1.3.3 Defining information environment

The *Random House Dictionary of the English Language* (1989:650) defines environment as "the aggregate of surrounding things, conditions, or influences". Given the above definition of information, for this research, information environment is therefore understood to mean the conglomeration of information (knowledge through learning, experience or instruction), organizations, or systems/ conditions for the processing and/ or dissemination of information.

1.1.3.4 Defining knowledge

The *Merriam-Webster Online Dictionary and Thesaurus* (2008) says: the fact or condition of knowing something with familiarity gained through experience or association: (1) the fact or condition of being aware of something (2) the range of one's information or understanding. On the other hand, the *Visual Thesaurus online* defines it as the psychological result of learning and reasoning. "When information is analyzed, processed, and placed in context, it becomes knowledge" (Gandhi, 2004: 369). With prior experience and understanding people use it to make value judgements. This helps make decisions in similar situations with some level of predictability. "Knowledge relies not on technology but on people, who have knowledge, develop it and act on the basis of it" (Emerald Insight Staff, 2005:2). In this research, the way that we perceive life situations is therefore the definition of knowledge as understood from the given meanings.

1.1.3.5 Defining knowledge environment

When a defined information environment exists, interaction and communication of the people involved promotes a knowledge environment. Materska (2004: 142) adds that there is a "focus on relationships, collaboration, critical thinking, innovation, adaptability, intelligence and individual and group learning - generally on communication - as communication is the means to connect human minds through interaction". In this

research, a knowledge environment is viewed as essential for the practice of knowledge management.

1.1.3.6 Defining knowledge management (KM)

Emerald Insight Staff (2005:2) says KM:

> is about exploiting and realizing knowledge in the workforce, fostering a culture where knowledge sharing can thrive and how an organization develops its people and their knowledge as individuals, as teams and at an organizational level.

In addition, KM emphasizes "collaborative learning, the capture of tacit knowledge, and value-add obtained through best practices and data mining" (Gandhi, 2004: 373). Rowley (2003), Singh (2007), and Wen (2005) highlight the fact that KM encompasses both the management of people and of information. From the definitions given, it appears that there is not one standard meaning. However, the interpretation adopted in this study is that when an organization seeks to improve its performance by enabling learning and innovation while solving its problems, acknowledging and resolving gaps in its operations, and recognizing knowledge (comprised of people and information) as an organizational asset which has to be managed through enabling policies and institutional tools, that is KM.

1.1.3.7 Defining knowledge management practices

KM practices in higher education are actions aimed at improving the internal flow and use of information through knowledge acquisition and knowledge sharing for organizational effectiveness (Kidwell, Vander Linde and Johnson, 2000; Williams *et al*., 2004).

1.1.3.8 Defining Web 2.0 technologies

Web 2.0 refers to ongoing World Wide Web technology development that has resulted in a set of new technologies and services. Its applications or services include the use of blogs, video sharing, social networking and podcasting - reflecting a more socially connected Web in which people can contribute as much as they can consume (Anderson, 2007b).

1.2 Statement of the problem

Library support at MCNY is in the form of print and online resources, reference services as well as information literacy classes for all library users. The library currently suffers from an inability to provide every resource and service that the students and faculty require. This is confirmed by the MCNY Self-Study (2009: 51) which states that there is consensus among students and staff that "library resources and services are not adequate". The reasons are financial as well as practical. Firstly, the library cannot survive in isolation and provide 100% of what the College library users need. The cost of books and other information resources has become too prohibitive to cope with, so networking with other librarians and libraries for interlibrary lending and discounts when purchasing material has become essential, but it is still not sufficient. Secondly, if the money was available to buy every book and every update and new edition available, space limitations would be prohibitive. The actual floor and shelf space at the MCNY library cannot accommodate limitless numbers of books.

Thirdly, there are now so many resources provided online that the library has to balance between what is available in print and what is available through access alone. Fourthly, with staff cuts that have taken place due to a shrinking budget, it is not possible to have a robust library staff compliment to give sufficient attention to individual library user needs. Fifthly, the library is a department within the larger institution and to a large extent operates within the managerial and organizational parameters of the organization. This means that decisions that may seem best suited for the library alone are not suitable unless they give advantage and enhance its relevance to the College. In addition to those challenges, a new information environment has brought additional demands of its own. Despite the given circumstances, the library is still expected to provide a consistently efficient and effective quality service.

Following the question raised by Creswell (2007: 102), "why is this study needed?", and the suggestions of Hernon and Schwartz (2007: 307) that the statement of the problem should "withstand a reviewer raising the "so what" question", the problem statement in

this case would be that the MCNY library is providing a service that needs quality improvement as it does not adequately address challenges posed by a fast changing information environment. However, no documented study has investigated why that is so and what needs to be done to improve it.

There is uncertainty about whether the use of KM principles and tools can partly solve the library's approach to improving its quality of service to its community in the modern information environment. KM has been implemented in commercial and business environments towards operational advantages and financial gains. It may be possible that the KM survival principles and tools could help the library to improve performance and fulfil its mandate. Because librarians serve the same groups of users who consume the products of the retail, entertainment, and mass media industries, their efforts have become more focussed towards creating library spaces that are inviting, dynamic, and exciting for the library users. These entail, among other things, the implementation of Web 2.0 technologies. Web 2.0 is the second generation of web-based services and tools that emphasize online sharing and collaboration among users. They are not KM, but can be used as tools in KM practice.

This shift in focus by librarians partly constitutes what Rowley (2003: 439) views as the change of "paradigm of KM". Special libraries, especially in the commercial and legal sector, are pursuing this road. According to Weerasinghe (2006: 551):

> Libraries that have the ability can acquire commercial tools and developers to build a knowledge base that makes information readily available at the point of need. Corporate libraries are being re-invented as knowledge centers, but librarians are reluctant to move beyond traditional information service oriented work and move on to the analysis and interpretations of the contents.

The research problem is further addressed by looking at the research objectives, research questions (what? why? how?) and possible sources of data. According to Hernon (2001: 82:

The objectives operationalize those components of the logical structure that the study will explore and provide a framework for the formulation and testing of hypotheses, and the asking of research questions

This is elaborated in the research objectives and questions below.

1.3 Research objectives

The study was intended to assess and evaluate the practices that MCNY and its library has in place, including KM practices. This was done to find out if indeed the answer to shortcomings is KM practice. Specific objectives are:

- To investigate the information provision practices at MCNY;
- To determine if the concept of KM is understood at MCNY;
- To determine the need for KM practices in the library by investigating what knowledge assets exist and bring out the gaps so as to find a solution that best fits the working environment of MCNY;
- To determine and assess what knowledge generation, knowledge sharing or transfer, knowledge retention and use policies by MCNY and the library are in place;
- To determine the extent to which MCNY encourages information flow and use of modern technologies such as the freely available Web 2.0 tools; and
- To make recommendations on implementing KM practices that enhance the value of library service at MCNY.

Besides finding out what KM practices are in place, this case study was an investigation into why academic librarians should consider KM practice as important, and how knowledge is retained by the library. Referring to "a clear purpose or research question" Rowley (2004: 209) suggests that "in organisation research the question is more likely to emerge from the professional context within the organisation". So it was very important to find out how the MCNY community valued and organized its knowledge assets, interacted, valued collaboration, and if knowledge retention in the library could be

enhanced. This was done with the use of questionnaires, observation, interviews, and using institutional documents. In other words, the mixed methods type of research was used in this study as a way of overcoming personal biases that are more likely in the use of a single methodology, including even bringing out conflicting evidence that a researcher may not be willing to highlight.

1.4 Research questions

Onwuegbuzie and Leech (2006: 475) contend that:

> research questions in mixed methods studies are *vitally* important because they, in large part, dictate the type of research design used, the sample size and sampling scheme employed, and the type of instruments administered as well as the data analysis techniques (i.e., statistical or qualitative) used.

The questions are used for obtaining both qualitative and quantitative data. Those that result in quantitative data are specific and tend to have the "what is…?" or "what are…?" questions, while those that result in qualitative data tend to start with "what" and "how" questions (Onwuegbuzie and Leech, 2006).

Specific questions that informed this research are:

- What do librarians, faculty, and administrators understand KM to mean?
- What are the knowledge needs of the MCNY community?
- What knowledge retention policies, practices and gaps are in existence at MCNY?
- What modern technologies are in use at MCNY that enhance the environment for KM practice?
- What are the tools, methods and techniques used for knowledge retention--knowledge assessment, knowledge acquisition and knowledge transfer at the MCNY library?
- What are the recommendations on implementing KM practices that enhance the value of library service at MCNY?

Research objectives, questions and possible sources of information are reflected in Table 1.

Table 1: Research objectives, questions and possible sources of information

Research objective	Research question	Possible source of data
To determine what MCNY employees understand KM to mean	What do MCNY employees understand KM to mean?	Literature, questionnaires, interviews
To investigate the KM needs of MCNY	What are the knowledge needs of MCNY?	Literature, observation, questionnaires, interviews
To determine and assess knowledge generation, presentation or transfer, retention and use policies by MCNY library	What policies that are in place at MCNY encourage the use of KM practices?	Literature, observation, questionnaires
To determine and assess the extent to which modern technologies are used as KM vehicles	What modern technologies does the MCNY community use in the execution of duties?	Institutional documents, observation, questionnaires

1.5 Justification for the research

A realization of the impact of the fast changing information environment of the 21st Century makes it reasonable and necessary for an organization such as the MCNY library to determine and define what constitutes its knowledge assets. This is because knowing about them enables using them effectively to become possible especially if they are organized in a way that is meaningful to the users (Rao and Babu, 2002). To a large extent, this requires quality information output, but at the same time doing it inexpensively or at no added cost to the organization, and avoiding of the Pareto syndrome (that is the tendency to spend 80% of resources on 20% of the users), especially as budgetary constraints are a major factor in service provision. The important point is for organizations to recognize their valuable knowledge assets and avoid putting themselves where, according to Sharma and Chowdhury (2007) "they fail to figure out what knowledge they need, or how to manage it in the context of application".

Another justification for this research was to review the perceived and actual knowledge handling practices at MCNY and of the librarians, and to consider the extent to which librarians can assume the role of KM practitioners. White (2004) from a case study at

Oxford University Library Services found that at her library, academic librarians can benefit from integrating KM into library processes. The use of technology as an enabler in tapping knowledge, the importance of collaboration among involved parties, and the roles of the librarians in complementing the creation of KM programmes are similar conclusions that studies by Ajiferuke (2003), Anderson (2007a), Branin (2003), Farkas (2007), Foo and Ng (2008), Mphidi and Snyman (2004), Singh (2007), and White (2004) share in common. This justifies the importance of a KM study in an academic library by carefully investigating all the functions of the library, and its place in its parent institution. This helps determine the direction the library takes in improving the quality of its service, with the support of the relevant offices in the institution.

The justification for investigating KM practice in the context of an academic library was also due to the fact that in the modern information environment, librarians have to know how and be always ready to change the way they operate. Information dissemination and consumption keeps changing. Listening and acting upon the needs of students and faculty, effective communication, information sharing, and knowledge retention are assumed to be critical to the success of KM initiatives. Given this scenario however, it is noted that knowledge is not tangible. As such, it is not so easy to justify possible outcomes of KM initiatives. In addition, changing the way people have traditionally been operating can be a difficult hurdle, especially as the approach is to promote knowledge sharing as well as a learning organization - even in a college environment. This is because it is not just individual change in the library alone, it touches on MCNY culture as a whole. The research questions raised in Table 1 help create a framework within which to investigate without losing focus.

The aim and desire of librarians is to provide quality service especially that now libraries have become gateways to comprehensive digital collections and access to information resources, not ownership; facilitate interactive learning; and librarians play the part of content creators. Rowley (2003: 433) coins this role as “gatekeepers to the future”. But then, “many examples illustrate that guessing and good intentions are not a basis for effective action…we must check our theories and hypotheses” (Fitz-Gibbon, 2004). An

estimate of best practices or recommendations should therefore come out of this study. So this research helps in finding out what KM practices are in place at MCNY that are likely to help improve the performance of the library.

1.6 Originality of the study

In research, originality starts with the tools, techniques and procedures used. The tools refer to the creation of instruments to do the study, such as a questionnaire. Techniques include processes such as interviewing and observation, while the research procedure includes obtaining Institutional Review Board (IRB) consent and researching during private personal time rather than during times that one should formally be working as a librarian. Originality also involves the exploration of the unexplored and the unanticipated. Previous studies on library user satisfaction at MCNY have been undertaken, but are dated. Examples include an April 2004 Librarian Skills Gap survey; a June 2004 MCNY Library User Survey; and a June 2003 Faculty User Survey. Results of all the mentioned surveys were not internally published, and follow ups to the surveys need to be undertaken. There have not been studies at MCNY that are specifically targeted at KM in the library, and that makes this particular study original.

Most KM research in libraries has been done by or about corporate libraries (Wen, 2005). There are, however, a number of studies that look at the importance of integrating KM practices into library processes. Originality in this research therefore relates to the study of a particular case outside the realm of profit-making businesses, in an action research context, to understand how people in a college library can be major players in the capture, retention and creation of knowledge and at the same time, be able to disseminate it and use collaboration as a tool.

Using the results from other relevant studies that have been conducted elsewhere helps the researcher gauge where the MCNY library stands. These studies include one at the University of Ontario (Canada) by Ajiferuke (2003) who emphasizes the fact that information professionals/ librarians have a role to play in a KM environment. The same

view is echoed by Anderson (2002: 3) who says "librarians have many of the skills identified as vital in KM, and are in a position to take a lead role in this new economy". Maponya (2004), in the context of the University of KwaZulu-Natal (South Africa) comes up with similar conclusions too. Parirokh, Daneshgar and Fattahi (2008) made a Reference and User Services Association (RUSA), of the American Library Association, study to include KM practices as applied to American libraries. The results of their studies reveal that most of the libraries investigated value knowledge sharing, and the majority of librarians see the importance of collaboration and knowledge sharing. Williams *et al*., (2004) made a similar study at the Vanderbilt Medical University (USA), with similar results. Hamid and Nayan (2007), in a case study at the National Library of Malaysia, highlighted the important role of the KM initiative in supporting the work of a knowledge intensive organization like the library. These studies gave insight into concerns about possible use of KM principles by the library at MCNY.

1.7 Research methodology and design

The methodology used in this study is mixed methods where qualitative and quantitative research is integrated in one study. The design is action research that was intended to discover ways of enhancing the value of library service, that is, solving a practical problem within the MCNY library, as well as generating new knowledge and understanding of library work processes.

1.7.1 Research methodology

Research methodology is the mapping out of an approach to solve a research problem. Studying the MCNY library involves an investigation into different groups of people. When a case contains more than one sub-unit of analysis, it is regarded as an "embedded" case study (Yin, 2008: 46). The context in this study was the MCNY library, and the units of analysis were the different groups of staff from whom data were collected, and the evidence that KM principles, where applied, resulted in enhanced library service.

The methodology to study an embedded case study provides a means of integrating qualitative and quantitative research methods in one study, resulting in mixed methods research. Yin (2008: 63) states that "certain case studies already represent a form of mixed methods research". The research of Creswell and Plano Clark (2007) suggests that mixed methods research is a design for collecting, analysing, and mixing both quantitative and qualitative research (or data) in a single case study or series of case studies, in order to understand a research problem. This is viewed by some scholars as a third approach. According to Johnson, Onwuegbuzie and Turner (2007: 129):

> mixed methods research is an intellectual and practical synthesis based on qualitative and quantitative research; it is the third methodological paradigm (along with qualitative and quantitative research).

A similar conclusion is reached by Newman and Benz (1998) who seek to abandon the dichotomy between qualitative and quantitative methodologies, but rather, an interactive continuum. This is based on their belief that all behavioural research is made up of a combination of both qualitative and quantitative constructs.

According to O'Sullivan, Rassel and Berner (2008: 25), research methodology takes the following steps:

- Deciding when and how often to collect data;
- Developing or selecting measures for each variable;
- Identifying a sample or test population;
- Choosing a strategy for contacting subjects;
- Planning the data analysis; and
- Presenting the findings.

This research was done by following the mentioned steps.

1.7.2 Research design

In this study, the design used is action research. In that regard, the researcher worked in the place of research, aimed at improving or changing and understanding work processes (Zuber-Skerritt and Fletcher, 2007). According to Zuber-Skerritt and Perry (2002: 175),

the two goals of doing an action research study are "to solve a practical problem within an organisation, and the second is to generate new knowledge and understanding". The "main action research medium … is the case study" (Gray, 2004: 26).

The case study is "good for contemporary events when the relevant behaviour cannot be manipulated" (Rowley, 2002: 17). It answers to the questions of "what", and "how" (Rowley, 2002: 17), which Kyburz-Graber (2004: 54) agrees with and adds the fact that case study research questions do not include "who". The case study may also begin to address the "why" question. It is the exploratory type of study which, according to Hernon and Schwartz (2009b: 1), occurs "in areas for which little, if anything is known. These studies might be less structured and more flexible than descriptive studies".

Using the case study as a research mode emphasizes its qualitative nature. However, gathering data both qualitatively and quantitatively makes it mixed methods. According to Fidel (2008: 265) "mixed methods research employs a combination of qualitative and quantitative methods". Kumar (2005: 20) suggests that "the main function of a research design is to explain how you will find answers to your research questions". Yin (1984: 29) identified five components of research design that are important for case studies, which are: the study's questions, its propositions, if any, its unit(s) of analysis, the logic linking the data to the propositions, and the criteria for interpreting the findings. The idea is to promote investigator objectivity because subjectivity can be a problem.

To systematically study this case, there was need for a case study protocol. This protocol contains the survey instrument, procedures and general rules that should be followed in using the instrument. Rowley (2002: 21) maintains the importance of a "case study protocol", while Tellis (1997a: 80), in agreement with Yin (1994: 64), goes further to point out that a case study protocol includes rules and procedures, besides the instrument itself. According to Yin (1994: 64), the protocol has the following important sections (see Appendix A):

- Clearly specified objectives, issues, topics being investigated;
- Access rights to databases and other sources of information;

- Case study questions (specific questions that the investigator must keep in mind during data collection); and
- A format for the narrative.

Yin (1994), further explains that procedures are very important especially as the investigator does not control the data collection environment as in other research strategies. During interviews, which are open - ended, the subjects' schedules dictate the activity (Stake, 1995). In addition, Rowley (2002) and Yin (1994) emphasize the importance of gaining access to the subject organization, having sufficient resources while in the field, clearly scheduling data collection activities, and providing for unanticipated events must all be planned for.

Kumar (1999; 2005) points out the importance of a time-frame to the process of doing research. According to Hernon and Schwartz (2009b: 1), many instances of library and information science (LIS) research reflect "one-time data collection". In this case, the timing of the actual field study was in October-November 2009, during the fall/ autumn semester. The main reason for choosing this time was to have access to part-time faculty at a time of the semester when they were most likely to be regularly on campus and with relatively regular schedules of work. Other times, particularly towards or at the end of a semester, they are marking test papers and student projects and are likely to be too busy to spare time for the needs of a researcher. Additionally, being part-timers can make it difficult to follow up on them during vacation periods.

A survey of library work spaces such as database use was done to reveal information seeking habits of library users. The rationale for doing this was based on the premise that unsaid personal interests of information seekers as reflected on the database usage patterns, and communication on the interactive platforms can reflect tacit knowledge of the research subjects.

1.7.3 Sample frame

A sample frame includes all the individuals in a target group, and in this study that was the 451 MCNY staff and faculty. This is the group from which the sample was extracted, with exact numbers explained in section 3.5.1.2 of Chapter Three. For quantitative data collection, a simple random sample was used. As such, every individual employee in different employee categories had an equal chance of being selected as part of the sample. For qualitative data collection, purposive sampling was used because certain individuals in the MCNY population were considered key (Leedy and Ormrod, 2005) to providing more information and insight about the way the library operates.

1.7.4 Data collection methods

Besides an extensive literature review about KM and its relevance to library situations, for purposes of later on either confirming or refuting, or further discussing the facts and claims of sources used, a questionnaire (see Appendix F), an interview protocol (see Appendix G), and an observation protocol (see Appendix H) were used as tools for data gathering, with questions based on the research questions in Table 1. Additionally, a library database usage survey was carried out. This use of multiple methods of data collection constitutes a triangulation dimension (Grünbaum, 2007; Merriam, 1988; Rowley 2002; Zuber-Skerritt and Fletcher, 2007).

Triangulation includes more than the use of multiple methods. It also involves the process of combining and comparing data from multiple data sources, and corroborating findings and results. Mathison (1988: 13) suggests that "through triangulating we expect various data sources and methods to lead to a singular proposition about the phenomenon being studied". These triangulation procedures were used because in qualitative research, it is difficult to escape the personal subjective experience of the researcher, so was meant to limit researcher bias, especially as the case being studied was one in which the researcher was involved. On the other hand, in quantitative research in this case, the main emphasis was on ensuring the representativeness of the research from various perspectives, hence

the use of a closed-ended questionnaire as well as a structured observation protocol discussed in section 3.6.4 of Chapter Three.

1.8 Data analysis and presentation

Data needs to be cleaned and evaluated before presentation in tables and charts (Ngulube, 2005). For the quantitative part of the investigation, data were pre-coded, but for the qualitative part, coding was done after data had been collected. Relationships between variables were studied in an attempt to find solutions from the collected data. This complemented the written description of the results. Mixed methods data analysis discussed in section 3.7 of Chapter Three explains the nature of a mix of data analysis from both the qualitative and the quantitative findings, including the manner in which the results are integrated.

1.9 Ethical considerations

In LIS research, emphasis on ethical standards is focussed on maintaining the confidentiality of participants. In an educational institution, the Institutional Review Board (IRB) has to be made aware of the research so that they help ensure the anonymity, respect and consent of the participants. In the current study, permission from the MCNY IRB was sought and granted before proceeding with the study (see Appendix B). Additionally, the research was approved by the UNISA College Postgraduate Committee, and cleared by UNISA's University Research Ethics Board before being undertaken. This resonates with the UNISA Policy on Research Ethics (2007) (see Appendix C) which specifies that researchers have to avoid undertaking secret or classified research, be competent and accountable, respect human participants, and be responsible in every way while doing their research.

When doing research that involves people, it is important to let them know exactly what the endeavour is about so that they do not feel exploited, and also assure them of the confidentiality involved. In sampling for a study, Onwuegbuzie and Collins (2007: 306)

suggest that an ethical design is one that "adheres to the ethical guidelines stipulated by organizations such as Institutional Research Boards in order for the integrity of the research to be maintained throughout and that all sample members are protected". According to Carlin (2003: 4), ethical design focuses on:

> ensuring individuals', anonymity, maintaining confidentiality, gaining access to settings for research purposes and informed consent, protecting individuals from harm caused by participating in and presenting the research, and examining the relation between the researcher and the researched.

In line with the UNISA Policy on Research Ethics (2007), it was important to notify the identified sample population, before they were requested to participate, of the aims, methods, anticipated benefits of the research; their right to abstain from participation in the research and their right to terminate at any time; the confidential nature of their replies, and assure them of their privacy, and autonomy.

According to Bradburn, Sudman and Wansink (2004: 14) informed consent "implies that potential respondents should be given sufficient information about what they are actually being asked and how their responses will be used". This is done so as to get their consent without pressure on them, and it has to be clear to the respondents that the decision to participate is voluntary. In this study, an informed consent form accompanied the questionnaire to help give the research the desired level of being ethical. Restrictions were set to the online survey by encrypting messages to the intended subjects, as well as information from them. In addition, permission had to be obtained prior to observing College documents which were produced for other purposes, and any developments of the work always to be visible/ transparent to others (Zuber-Skerritt and Fletcher, 2007).

Carlin (2003: 15) mentions the importance of researchers adhering to codes of ethics set by their professional associations. A code of ethics is:

> a formal statement of the profession's values regarding ethical behaviours. The code of ethics focuses on principles and values that govern the behaviour of a person or group with respect to what is right or wrong (Shachaf, 2005: 514).

In this study, reference was made to the American Library Association (ALA) Code of Ethics of 1997 (amended January 22, 2008) (see Appendix D) as a guide. The ALA code of ethics is valued as one of the internationally recognized International Federation of Library Associations (IFLA) (2009) professional codes of ethics for librarians.

Integrity of research was an important part of this study because of the need to use the data obtained for comparison and extrapolation of conclusions. This is reiterated by Carlin (2003) who suggests the effective use of primary sources to avoid unwittingly reproducing errors of logic as they are in turn perpetuated by researchers who may use the work that someone has completed, with errors. Additionally, Shenton (2005) highlights the importance of avoiding plagiarism and respecting copyright in LIS research. The UNISA Policy on Research Ethics (2007: 4) clearly states that "researchers may not commit plagiarism, piracy, falsification or the fabrication of results at any stage of the research".

Besides the above considerations, Peterson (1983: 135) also points out that it is important for a researcher librarian to uphold professional integrity and be able to distinguish between activities pursued to "fulfil institutional expectations and activities undertaken to fulfil personal advancement". This is a principle enumerated in the ALA code of ethics as: "we do not advance private interests at the expense of library users, colleagues, or our employing institutions" (ALA, 2008).

1.10 Scope and limitations of the study

The margin of error or confidence level determined the extent to which the results confirm or dispute the assertion that academic librarians can operate as KM practitioners. This revealed the inherent imprecision of survey data. Another weakness was that, having been their librarian, a respondent may have felt the need to please, and in the process, jeopardize the accuracy of responses. This was to a large extent controlled by the use of multiple methods of data collection. The study is also limited to one very specific case therefore results may not necessarily be applicable to other institutions.

1.11 Outline of the thesis chapters

The thesis is organized into six chapters. Chapter One starts by defining the problem, then providing the research focus. Concepts are defined so that they do not remain general as they are meant to be specific to this research. The statement of the problem answers questions relating to the exact nature of the problem that the research is addressing. This is the reason for having clearly specified research objectives and research questions. The purpose of the research or its justification is to find ways of improving upon library practice at MCNY, or developing better ways of adding value to library operations.

In Chapter Two, there is a review of existing literature which helps clarify the nature of the problem, while highlighting gaps. It explains how the present research brings out in the open the gaps or problems through an examination of literature by other researchers. Put differently, "the author must establish that existing perspectives are inadequate, and persuade the reader that the new vision is relevant and adds greater insight to the phenomena than was possible previously" (Parry, 1998: 284).

Chapter Three explains the research plans and methods. This is where data collection methods are explained, while at the same time evaluating the research process. In Chapter Four, there is a presentation of the results, followed by an analysis and synthesis of the findings in Chapter Five. At the end is Chapter Six which is a presentation of the summary, conclusions and recommendations arising from the research, as well as highlighting implications for further research.

1.12 Referencing style used in the thesis

In doing research, the acknowledgement of scholarly works and ideas by other people is achieved by referencing and citing. At the beginning of the research, it is important "to find out which referencing style or citation format is used by or acceptable to your organization. The Harvard citation style, the Publication Manual of the American

Psychological Association, and the MLA style handbook are widely used" (Wilkinson, 2000: 4). The significance of this is the fact that "in a doctoral thesis, appropriate citation and critique signals the espousal of the appropriate values, etiquette, style and cultural savvy" (Parry, 1998: 287).

The Harvard style is the preference of the UNISA Department of Information Science. It uses the author and date rather than a numerical system, and one of the reasons it is in use is that in the field of library and information science, "many authors are more familiar with the author and date system and … other LIS journals use it" (Kimber, 2001: 329). Rumsey (2004) highlights the importance of correctly following referencing guidelines.

1.13 Summary

The research problem is introduced in this chapter by giving a background to the statement of the problem, and then looking further into it with the use of research questions and objectives. In order to clearly demonstrate that there are gaps in research, ideas are linked progressively. While justifying the need for this research, it was possible to also look at the originality of the study.

The main concern of the chapter was to understand the concepts of information, information environment, knowledge, knowledge environment, and KM as well as make the case for KM in academic libraries clearer, and to demonstrate the extent to which librarians can be viewed as KM practitioners. Questions are raised about what the MCNY faculty, librarians and administrators understand KM to mean. Literature review also shows that despite knowing that KM is important for improving efficiency, there is a limited number of studies that focus on how libraries use it. Literature has, however, emphasized the need for use of KM practices in libraries because of rapid changes that are taking place in the information world.

A brief summation of the research design and methodology was given, as well as the data collection methods. The importance of upholding high ethical standards, and the need for

truth and accuracy (that is, integrity) of data with particular reference to librarian researchers was discussed. In addition, the reason for utilizing the Harvard referencing style in this study was mentioned as its being the preference of the UNISA Department of Library Science.

CHAPTER TWO: LITERATURE REVIEW

Reading maketh a full man; conference a ready man; and writing an exact man
Sir Francis Bacon (1561-1626)

2.0 Introduction

Chapter One introduced the research problem that deals with a College library which has to improve the quality of its service against all odds, and suggested KM principles as worth looking into towards that end. This chapter was a review of the literature on KM in general and in libraries in particular. It sought to give a deeper understanding of KM and the different schools of thought, as well as the effect of proposed different organizational management styles on it. This was in the context of studying ways that KM can be applied, or not applied by librarians at MCNY in a changing information environment.

2.1 Role of literature review

It is difficult to start doing research with no reference to other scholars. At the beginning of the research process, it can be unclear how to identify the aim of the endeavour. The need for doing research may seem obvious because of a desire to increase operational efficiency, but articulating the idea in a manner that is systematic and organized can be complicated.

Doing some reading on the topic helps clarify matters. While the aim of a literature review is to support one's argument, it also summarizes and synthesizes the ideas that others have already put forward. The discovery of gaps which have not yet been covered by previous research helps refine and shape the direction of the investigation (Wilkinson, 2000). It then puts into perspective the practicality of ideas that one has or has come across. Leedy and Ormrod (2005: 64) confirm that the review of literature allows one "to look again" (re + view) at what others have done in areas that are similar, though not necessarily identical to, one's own area of investigation".

The knowledge that previous research has been done and literature is available on a topic makes it important to read those texts. The literature can be anything from a set of documents that originate from government, scholarly articles, to books, and institutional documents. When doing a review, one's personal opinion on whether or not one is in agreement with the sources and the conclusions reached is not necessary. What is important is how succinctly the literature in use supports the subject of research. According to Toncich (1999: 160), this means being "an impartial learner". It also matters to consider the time period the literature review covers. KM application in libraries is a growing area of research, therefore current information is very relevant.

It is important to have a summary and synthesis of the literature review. This is because a summary of the literature reviewed is a recap of the important information of the resources, and a synthesis is a re-organization, or a reshuffling, of that information. It may end up giving a new interpretation of old material or combining new with old interpretations. Leedy and Ormrod (2005: 80) suggest that in the summary, "you gather up all that has been said and describe its importance in terms of the research problem". In this case, it may also help trace the intellectual progression of the field of librarianship, including major debates.

In doing a literature review for this study, it was possible to evaluate the sources and use those that were most pertinent or relevant to KM practice in the library. The literature review therefore acted as a type of handy guide, that is, a useful resource that helped guide the research process and maintain focus. The research and views of scholars like Ajiferuke (2003), Branin (2003), Hamid and Nayan (2007), Jain (2007), Lynch and Smith (2001), Maponya (2004), Ngulube and Lwoga (2007), Rowley (2001, 1999), Sarrafzadeh, Martin and Hazeri (2006), and Vasconcelos (2008) who see librarians progressing from collection managers to KM practitioners, therefore requiring additional skills to remain relevant, were significant in understanding the topic.

Doing literature review helped in finding out what methodologies and sampling procedures have been used before. In so doing, it was possible to match the effectiveness

of the methodologies against the results obtained. This gave insight into how to come up with a research strategy, and be able to justify its appropriateness for this research project. It also gave direction on the need to cite as well as in the proper referencing style in library science.

2.1.1 Referencing

Referencing is letting readers know where you learned or found the information that you are writing. When quoting a source or reference as authoritative, that is referred to as citing. Citations demonstrate the existence of knowledge and an understanding of the subject, an awareness of works and authors that have been instrumental in the development of, or provide meaningful comment on the subject, and provide a framework to work in a thesis. Bell (2005: 63) points out that:

> the best way to ensure you will never use other people's words or ideas as your own without acknowledgement is to be meticulous about your note-taking and in recording exact details of references.

References are "frozen footprints in the landscape of scholarly achievement; footprints which bear witness to the passage of ideas" (Cronin, 1981:16).

There are several automatic ways of organizing citations in existence nowadays that one can use in the process of doing the research. For this study, ZOTERO was used. This is a free open source Mozilla Firefox add-on that works with Microsoft Word to collect, organize, and cite sources. Its major weakness at the time of this research was that it only worked in the context of Firefox, and no other browser. Files obtained from anywhere else had to be saved and imported manually, and that discouraged its maximum use. Citations were accessible only from the computer that its software was installed on, and the researcher found that to be a major inconvenience. A number of databases which were extensively used as sources of scholarly articles in this research now allow direct exportation of citations into such citation organization packages as Reference Manager, ProCite, BibTex, Refworks, Endnote, and Turnitin. Examples include EBSCOhost, SAGE, WilsonWeb, Emerald, JSTOR, and LexisNexis. To export citations using ZOTERO, one was limited to using the Mozilla Firefox browser.

2.2 Sources of information

The most used research information in this study originated from various sources. For example, an examination was made of institutional documents such as the Audrey Cohen Archive (a collection of materials that explain the visions, about college education, of the founder of the school), the library handbook, and a study of usage patterns of databases was done. MCNY library practice, as specified in the library handbook, is based on the standards of the Association of College and Research Libraries (ACRL) Objectives for Information Literacy Instruction: a Model Statement for Academic Libraries (2001). These standards require that librarians be involved in the promotion of information literacy in their workplaces. ACRL also gives guidelines for faculty and administrator information literacy, which is one of the major requirements of the Middle States Commission.

The concern with information literacy arises from the assumption that individuals that are information literate appreciate the importance of quality information, and know how to retrieve and use it. As such, they also can be effective creators of valuable information, and subsequently knowledge. This forms one of the bases for faculty - librarian collaboration. The place of information literacy in KM is discussed in more detail later in this chapter.

Library reports referred to also include the library annual report, and the 2009 MCNY technology survey report. The annual report was reflective of the budget which is one of the most direct contacts that senior management of the College has with the library. The magnitude of investment in improving and enhancing library resources signifies the extent to which the College values research and scholarship. The library, in turn, creates a budget every fiscal year but it addresses only one side of the equation – the funds needed to pay library staff, purchase of books and research materials, create and deliver information literacy services, purchase and maintenance of equipment. In short, the library functions as a cost centre of the College. Librarians therefore need to create value

to justify receiving continued institutional support, and involvement in KM practice can be one such method.

The other reports from the library were database usage statistics, observed user requests and queries on the e-mail service. They gave an indication of how busy the library was at the time that the research was done during the academic year, and what resources were accessed the most. This did not, however, give any indication of the value of the databases. For example, one user of a database that shows low access statistics may produce priceless results from their research, but that kind of detail was not reflected. The statistics also did not indicate when online access to databases was poor due to internet connection problems. The practical research of Williams *et al.,* (2004) at the Eskind Biomedical Library at Vanderbilt University Medical Centre is an example of an instance where statistics are closely monitored by the system in place, with the result that:

> Scripts on the server are set up to run each month to process the usage data and the results are output to a spreadsheet which is automatically e-mailed to portal content administrators, as decisions about successful and unsuccessful implementation of resources are often gathered through these statistics (Williams *et al*., 2004: 101).

But even these results do not reveal the enhanced value of the library, but they help show the pattern of use.

The 2009 MCNY technology survey indicates that "virtually every MCNY student has a computer outside of the College that can be used for schoolwork" (Kannan and Lutsky, 2009: 6). The survey results also indicate that students regularly use e-mail, Facebook, MySpace, and the Blackboard course management system. By implication these are platforms that can potentially be used to enhance library service. This means that learning outcomes have to be clear, instead of opting to use modern technology only for the sake of being seen to be modern.

From the books, dictionaries, and journals came information that explained the concept of KM more fully, including the explanation of terms. The books used included mainly

those that are found in the ebrary (the online database of online full-text books which MCNY library subscribes to). Other sources were ProQuest Digital Dissertations and Theses, Centre for Research Libraries (Dissertations from outside the U.S. and Canada), and journals for scholarly articles originating from EBSCOhost, SAGE, and WilsonWeb, Emerald Insight, and the Internet because it is accessible and broad (though highly unreliable, therefore requiring evaluation), ACRL social networking in Facebook and its blog, the BlendedLibrarian wiki and blogs.

The Blended Librarian Forum on the LearningTimes online community (LearningTimes, 2008) was also used to stay abreast of activities in the field of academic librarianship. It gave the sense that it is important to consider modern ways of providing service, including KM tools and principles. According to Bell and Shank (2004: 373), a blended librarian is:

> An academic librarian who combines the traditional skill set of librarianship with the information technologist's hardware/software skills, and the instructional or educational designer's ability to apply technology appropriately in the teaching-learning process.

This is similar to the "hybrid librarian" as explained by Wilson and Halpin (2006: 82) and the same term is used by Rowley (2004: 208) in discussing "digital and hybrid libraries". The LearningTimes community encourages the exchange of information in the form of online chats, webcasted events, the sharing of resources materials, discussion forums, and it facilitates librarians with shared interests and goals connecting with one another. The emphasis is on the fact that knowledge in libraries is created through conversation, and libraries are in the knowledge business (Bell, Shank and Lankes, 2008).

In order to effectively discuss KM in the context of libraries, it is necessary to understand clearly what it means, including its theoretical foundations or basis. That way the debate on whether it is relevant in libraries or not, or partially in the current information environment can be pursued better. To progress in the literature review, a framework that depicts the literature reviewed and the progression of ideas helps in making the process

organized. In this research, a map of research literature was created as illustrated in Figure 1.

2.3 Map of research literature

A literature research map helps give direction in terms of where information will be obtained for research. It allows the visualisation of who is doing the same or similar type of research, what has been written, what is the consensus, or discussions happening. This is an idea suggested in the Learning Light: Literature Road Map model which originates from the University of Sheffield (2007), as well as Altinay and Paraskevas (2008: 51), Creswell (2003: 39, 1994: 29) and Ngulube (2003: 32). Another example is provided by the University of Medicine and Dentistry (2009), New Jersey, and like the Learning Light Road Map, it provides a visual organization of the sources. Creswell (2003: 39) suggests a "hierarchical order that ends with a proposed study that will extend the literature", or flow charts or circles, but all with the same goal of depicting what is important and relevant.

Altinay and Paraskevas (2008: 51) point out that:

> a literature map is a visual representation of your search result, which helps you see how your search results relate with each other and where your study fits in relation to the broader literature on the topic.

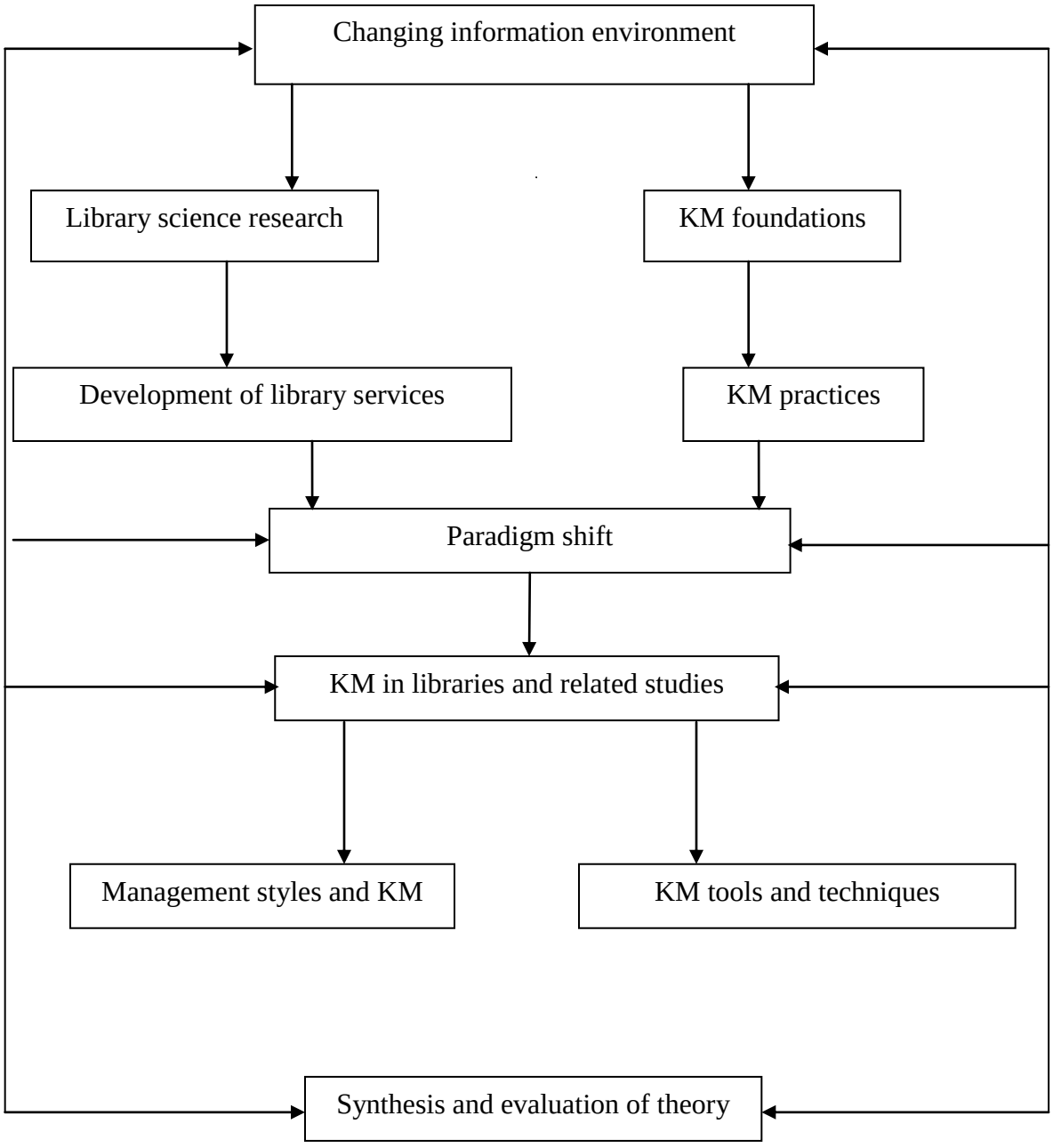
Altinay and Paraskevas (2008) and Creswell (1994, 2007) suggest that in creating a useful map of literature, it is important to start at the top with the title of the broad research topic. Theoretical areas influencing the development of knowledge for the topic should be included (Creswell, 1994). At each stage, subject headings are placed in a way that represents their relative connection to each other. There is also need to cite the important authorities. Ideas and subject headings are linked with the use of directional arrows that reflect the connections between subject headings.

Using the ideas that the above quoted scholars have explained, and the suggestions of Altinay and Paraskevas (2008), Figure 1, a map of research literature, was the result. It

starts with the broad subject of the changing information environment at the top. This information was available from studying College and library documents, a review of literature, and a look at related and relevant studies that have been done to cover the topic of KM in libraries.

It was important to understand the foundations of KM in order to verify its relevance to libraries. The foundations of KM were explained in order to bring out the implications of considering the use of its tools and techniques in an academic library situation. Looking at management styles became relevant because they affect the way management is practiced, and hence the application of KM. Several viewpoints on use of KM in libraries were looked at, and that progressed towards a paradigm shift from collection development to KM. That required a look at related studies where KM had been considered as a way of understanding the shift in library service practice. A synthesis and evaluation of theory helped look at the status of theory in library science, according to the literature that had been reviewed.

Figure 1: Map of the research literature



2.4 Changing information environment

A changing information environment includes changed methods in the management of print and digital information, information policies and architecture that allows for sharing and openness. Most of this change has been caused by internet developments. As a result, a large number of modern information users tend to determine what information they want to use, with the use of social networking such as blogs, real simple syndication (RSS), chat (Anderson, 2007b; Bell and Shank, 2004; Carpenter and Steiner, 2005; Coyle, 2007; Dempsey, 2006; Fichter; 2005; Foo and Ng, 2008; Harris and Lessick, 2007; Macgregor and McCulloch, 2006). The focus is on "how the individual receives, uses, enhances and shares information" (Green, 2008: 13). An example of the use of collective intelligence is the Wikipedia that allows additions and changes from any individual who perceives themselves as experts.

The Open Access Initiative is an example of how much the internet has become a tool for information and knowledge sharing and exchange (Suber, 2007). That initiative also allows for scholarly publishing to take place faster, with pre-prints available well before actual publication dates. In that environment, librarians have become content managers in addition to providing information services. Cornelius (1996: 131) succinctly points out that:

> what needs to be considered is the question of knowledge and power in communities and how that relates to the work of librarians and information managers whose professional claim it is to organize that knowledge.

In the context of this study whose focus is on library service, it is necessary to find a way of benefitting from such an environment. Maybe use of theory can help understand and anticipate changes in the discipline.

2.5 Use of theory in library science research

The theoretical foundations of a discipline are the basis around which research and development of the discipline is focussed for generating ideas (Bawden, 2008). This

research sets out to understand the foundations and existing theories and schools of KM thought and at the same time investigate the applicability of KM practice to library situations. Seeking for theory is based on the fact that theory is objective knowledge, a map that is not dictated by an individual person's approach to experience (Polanyi, 1962). Mitchell and Jolley (2007) specify the benefits of using theory as opposed to the use of common sense in doing research by explaining that:

> theory tends to be more consistent than common sense…, usually doesn't contradict itself…, tends to be more consistent with existing facts than common facts…, is not restricted to making commonsense or intuitively obvious predictions…, summarizes and organizes a great deal of information…, focuses research…, is broad in scope…can be applied to a wide range of situations, researchers can generate a wide variety of studies from a single theory…explains facts with only a few core ideas.

The *Visual Thesaurus online* (2008) defines a theory as "an organised system of accepted knowledge that applies in a variety of circumstances to a specific set of phenomena; a belief that can guide behaviour".

Library science scholars do not share a single understanding or view about what library science theory comprises and how it should be used within research. McKechnie and Pettigrew (2002: 406) explain that "broad differences exist in the use of theory in LIS that are associated with the broad disciplinary content of the research". However, Grover and Greer (1991) make an important contribution by suggesting that interdisciplinary work has a potential to answer the field's complex research questions.

Taking this view, KM concepts have been examined for their relevance to library practice. KM has its own definition problems, but Rowley (2003: 433) makes the comment that:

> To argue that there is no clearly defined and generally accepted definition of KM, or even to argue that it has nothing special or different to add to more traditional disciplines such as librarianship, and information management, or even to dispute the appropriateness of the word knowledge, as opposed to information, misses the

> point. None of these things matter if the world out there is in pursuit of solutions that help them to survive and flourish effectively in a knowledge-based society.

A problem pointed out by Gregory (2006: 46) is the fact that there is a "gap between research and work" in library science. Ponti (2008: 265) also discusses the wide gap that "exists between librarians and information science researchers. Knowledge sharing and collaboration between the two groups is still limited". Hildreth and Aytac (2007: 254) suggest that "library practitioners conduct more library - specific studies and academics conduct more use and user studies". Thus, if theory is actually put into practice, then a practical model for library science research could be the result.

Indeed, Glazier and Grover (2002:326) assert that "a considerable amount of research in LIS is based on action research with little attempt to apply theory". A further aspect raised by Ponti (2008) is that library science research has not been extensively done by individuals who are specialized in other fields than librarianship. A viewpoint expressed is the possibility that "people who have competencies in the philosophy of science and LIS…strengthen cooperative work towards a better theoretical foundation of LIS" (Hjørland, 2005: 6).

Because the technical services departments of libraries are responsible for acquiring, organizing, cataloguing, and/ or providing access to resources books and non-print resources, besides handling the maintenance of the online catalogue, Wen (2005) suggests that:

> how to effectively use our staff (human resources) and how to improve the efficiency and effectiveness of our technical services operations should be the real focus of KM in academic libraries.

However, this relates more to organizing the library than to incorporating the users who, in the modern information environment, are major players in how the library meets their needs. This calls for more than studying technical services alone, for example, by investigating how to take advantage of Web 2.0 functionality. Maybe keeping an open

mind about changes brought on by a changed information environment can contribute significantly towards library science theory.

Glazier and Grover (2002: 317) re-examine theory and suggest a "circuits of theory" research which is "presented to reflect today's postmodern approach to research". It attempts to include multiple approaches to data collection and analysis, whilst remaining open to opposing viewpoints, so as to be inclusive and creative in theory building and research. In a study of information use patterns of city managers, these theorists conclude that similar studies can be used in library science. A few of the theories quoted in library science works and their applications are mentioned below.

2.5.1 Critical realism theory

This theory originates from several schools of thought in philosophy, theology, and economics to describe the social and natural world. When applied in libraries, its focus is on what influences information seeking and use. It is based on the fact that library users have to find their way in a world of documents that keeps changing. "It allows for the explanation of human actions that are cognitively, intellectually, and pragmatically complex" (Budd, Hill and Shannon, 2008). In a conceptual paper that is examining the interdisciplinary nature of library science, Wikgren (2005: 11) explains that:

> an awareness of the fact that social and cultural structures exist independent of one's knowledge of them has implications on how many central problems in the LIS field are regarded and studied.

The critical realism theory comes out as "the conception of a stratified social reality, an awareness of the importance of contextualization, and the relation between structure and agency" (Wikgren, 2005: 1). In the library and information environment, this theory is focussed only on information seeking and use. However, it remains open to further studies and investigations.

2.5.2 The fuzzy set theory

The fuzzy set theory (FST) is based on the premise that an element either belongs to a set, or does not belong to it. This is a principle that Boolean logic in information retrieval operates on, where search terms are organized in such a manner that they include desired information search terms or exclude undesired ones. It has mathematical origins and according to Hood and Wilson (2002: 396):

> one of the characteristics of mathematical theories is that they are often applied in a wide range of different situations, beyond the wildest imaginations of the original developers.

Hood and Wilson (2002: 396) quote studies on the use of the FST in library decision-making specifically relating to the binding and tattle tapping of periodicals; they also reveal other studies on its applications to information retrieval focusing on the use of Boolean logic because of the fact that it uses sets; and also on fuzzy thesauri-based retrieval and OPACs. McGrath (2002b: 312), however, points out that there is no widespread application of this theory. This situation contributes to the need for studies such as the current one that investigates KM applications to libraries.

2.5.3 Probability theory

This theory was deduced from a study of the contrast between intralibrary use and interlibrary loan use/ document delivery at the British Library Lending Division (BLLD) by Urquhart (1978). It is analysed by Bensman (2007: 128) who points out that:

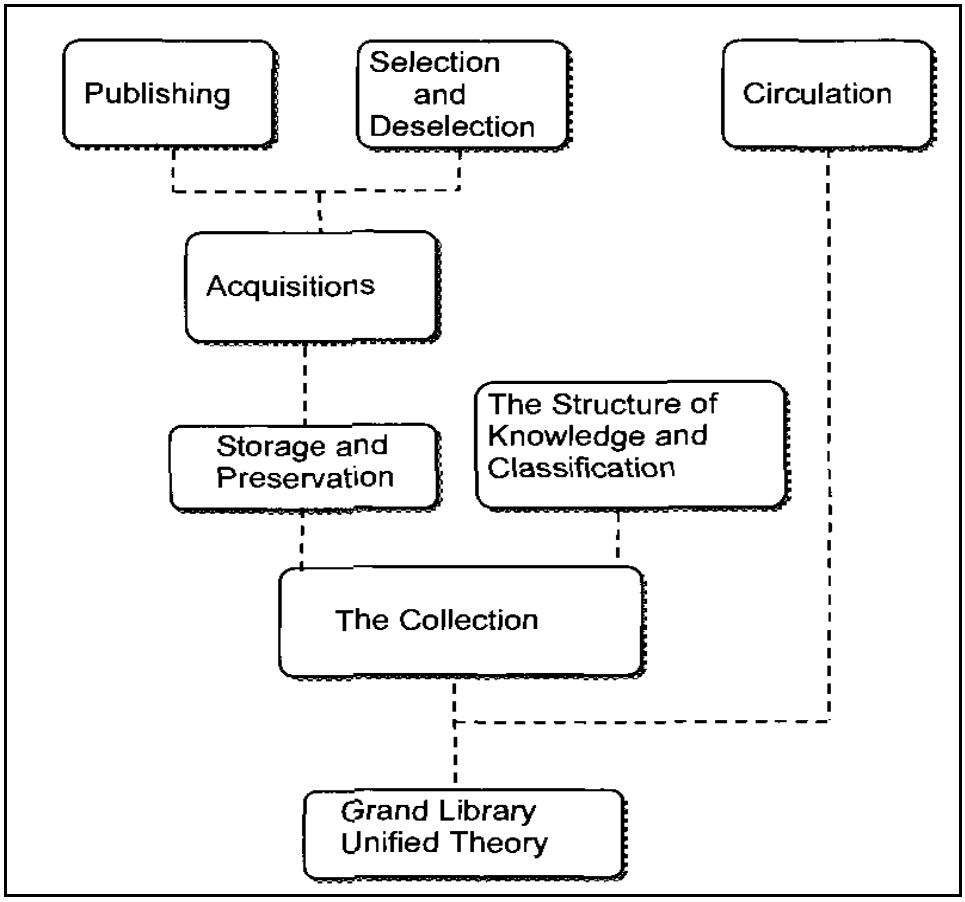
> Urquhart was not only the first to discover the highly skewed nature of library use and apply a probabilistic model to it, but he also was the first to understand the systemic functioning of probability in respect to libraries and scientific journals

By this is meant that Urquhart (1978) found in the BLLD how journal use concentrated on a small portion of a library's collection. There are opinion papers such as one by Robinson and Turner (1981) where use of the fuzzy set theory is also discussed for use in collection development. However, it has not been developed further to be applicable to more library situations, particularly in the modern information environment.

2.5.4 The grand unified theory

The grand library unified theory is akin to the physicist grand unification theory which talks of all nature's physical phenomena eventually being described as one. McGrath (2002a) suggests the development of theories that relate to the different functions of the library, and it is illustrated in Figure 2, creating a unified theory. It is modelled after a diagram, "Explaining the Forces of Nature," (Broad, 1984), and was reproduced in McGrath (1995), showing the traditional areas of librarianship with hypothetical connections (dotted lines) between them to indicate relationships not firmly established in any explanatory or predictive sense" (McGrath, 2002a: 352).

Figure 2: The Grand Unified Theory



(McGrath, 2002a: 353)

The grand unified theory is not developed even if it is an interesting attempt to view library science from all its functions. Regardless of that, in terms of a visual portrayal of library functions which can be studied as one whole, it gives clarity. Abbot (2004: 105) points out that "a grand unified theory of information able to tie together all the underlying phenomena, properties, flows, behaviours and problems associated with information, remains elusive. Indeed, it is not clear what such a theory should attempt to encompass". Floridi (2002: 43) suggests that the:

> task is not to develop a unified theory of information, but rather an integrated family of theories that analyse, evaluate and explain the various principles and concepts of information, their dynamics and utilization, with special attention to systemic issues arising from different contexts of application and the interconnections with other key concepts in philosophy, such as being, knowledge, truth, life or meaning.

The suggestion to put theories into families expresses consensus with the concept of paradigms, which are a more global manner of looking at a discipline than individual theories.

2.5.5 Grounded theory

Grounded theory focuses on "concepts that are drawn from the data rather than from abstract theory" (Grimes, 1998: 58). According to Glaser and Strauss (1967: 3), a grounded theory is one which will be "readily applicable to and indicated by the data" and "be meaningfully relevant to and be able to explain the behavior under study". The purpose of this theory is "to begin with the data and use them to develop a theory" (Leedy and Ormrod, 2005: 140).

Mansourian (2006: 395) quotes studies that have investigated the application of grounded theory in library user information seeking behaviours. However, it is also important to bear in mind the argument that has been advanced by Seldén (2005: 127) that:

> you want to advance from everyday knowledge to a scholarly level and theory is the tool that will achieve it. Data do not generate theory. The researcher generates

theory. If one's theory stands in connection with earlier advances in theory one achieves substantially for the academic community.

The idea of this research is to gather data, and as a researcher, improve/ advance on library theory.

Mansourian (2006) suggests the adoption of grounded theory to study library and information science, but refers to it as an approach to research rather than a detailed research method. Glaser and Holton (2004) call it a "general research methodology". This originates from Glaser and Strauss (1967) who emphasized grounded theory's focus on the generation and emergence of concepts, problems, and theoretical codes. Thus, again, there is no obvious direction for library science theory. Grounded theory lends itself as similar to action research, which is the research methodology proposed for this research. With no comprehensive theory to deal with the complications of the changing information environment, the option to consider KM applications to library situations was considered. However, it was also necessary to understand what KM means before attempting to use its principles.

2.6 Foundations of knowledge management

KM originates from a variety of disciplines where it was realized that knowledge is a valuable asset if tapped into and used effectively. It first appeared in 1997 (Jashapara, 2005) as industry was beginning to realize the importance of both tacit or implicit (intellectual capital) and explicit knowledge. It is founded on the expansion of capitalist economies, computerisation of industrial work, and economic competition. Its emphasis in literature is due to the fact that in the modern information environment, information and knowledge play a critical role in leveraging the operational advantages of an organization against its competitors (Davenport and Prusak, 1998; Drucker, 1999; White, 2004).

Essentially, KM practice involves knowledge capture and retention, knowledge classification, knowledge creation, and knowledge dissemination (Lee, 2005). It is driven

by competitive pressures and the need to manage an organization's intangible assets more efficiently. It fundamentally refers to changes that enhance competitive advantage and maximising profits (Davenport and Prusak, 1998; Drucker, 1999; White, 2004). Spender and Scherer (2007: 17) suggest that "KM may actually be more about managing an organisation's knowledge absence than about managing its knowledge assets". According to Broadbent (1998), KM:

> rests on utilizing and exploiting the organization's information (which needs to be managed for this to occur); and the application of people's competencies, skills, talents, thoughts, ideas, intuitions, commitments, motivations, and imaginations,

This diversity in origin and meaning also means that its theoretical foundations are likely to vary depending on the discipline in which it is being discussed or applied (Jasimuddin, 2006). According to Baskerville and Dulipovici (2006: 83), the field of KM is "building on theoretical foundations from information economics, strategic management, organisational culture, organisational behaviour, organisational structure, artificial intelligence, quality management, and organisational performance measurement". While concurring with that reality, Lloria (2008: 78) also points out that KM "is gradually taking on a direction of its own, and includes information and knowledge-creating systems, as well as strategic management and innovation". Vasconcelos (2008: 427) shares a similar view but points out that "there is a difference between the concerns, referents and discourses of knowledge management approaches", and as such, perspectives vary. Jashapara (2005: 137) refers to KM as "fragmented, and with no unifying theory of the discipline".

From the literature used, there is an indication that there are differing KM points of view, depending on the discipline of the author. However, Spender and Scherer (2007: 13) suggest that the way to deal with the diversity of KM literature is to "embrace it as the basis of a generative interaction or discourse between a plurality of heterogeneous elements rather than evidence of disabling fragmentation". Using what he termed 'the four pillars of knowledge management", Stankosky (2005), summarises KM concepts, as involving leadership/management of an organization; the operational aspects of the

organization; the principles and practices to ensure that individuals collaborate and share knowledge to the maximum; and the various information technologies peculiar to supporting and/or enabling KM strategies and operations. These "pillars" resonate with the KM principles by Davenport and Prusak (1998) that have been listed in section 1.1 of Chapter One.

The point that keeps being highlighted is that information is passive in nature, whereas knowledge is a dynamic and active resource residing in people's minds (Nonaka and Takeuchi, 1995; Polanyi, 1962). This is confirmed with the OULS study by White (2004), and by Jain (2007) who both conclude that knowledge is personal, human resource based and usually acquired through experience and/or observation.

The approaches or models that are covered in literature originate mainly from Japan, Europe, and the United States industries (Lloria, 2008). These are intellectual theories, and knowledge creation theories. Lloria (2008) proposes a synthesis that puts KM into three schools. These are the economic (commercial school), the technocentric school, and the behavioural school. They closely resemble the categories of McAdam and McCreedy (1999) who group KM into the knowledge model, the intellectual model, and the socially constructed model. These are not rigid categories, but a way of organizing KM practices that librarians need to be aware of as they seek to use some of those practices to benefit library situations. Such benefits include the spirit of collaboration, knowledge sharing, and the institutional cultural change that can occur from implementing KM practices.

2.6.1 Economic school

An economic perspective is one that involves both the production and management of material wealth. The economic school of KM thought sees knowledge as a part of that material wealth. According to Vasconcelos (2008: 426), it is based on measuring the "exploitation of knowledge as an economic resource". In other words, this school is knowledge – based, or Takeuchi's (2001) knowledge – creating school. This is the same view as that of Baskerville and Dulipovici (2006: 84) who refer to knowledge as "an

organizational resource" and Hillenbrand (2005) who sees it as a strategic resource. In agreement with Nonaka and Takeuchi's (1995) model (Figure 2), Ngulube and Lwoga (2007) view knowledge assets as determining the inputs and outputs of the knowledge-creating process.

The definition of knowledge, as indicated in Chapter One, is not always clear-cut. In an environment that puts an economic value to it, it was important to study the works of such important authors in the field as Nonaka and Takeuchi (1995) who classify knowledge as tacit and explicit, and McAdam and McCreedy (1999), Nonaka and Takeuchi (1995), Nonaka and Teece (2001), Nonaka, Toyama and Konno (2000), and Takeuchi (2001) who regard knowledge as an organizational asset. Nonaka and Takeuchi (1995) suggest that knowledge is transferred from one form to another because of a continuous process of interactions between tacit and explicit knowledge in an organization. The result is the ability to create new knowledge which has economic worth, and essential in innovation. For this to take place, an environment or space called *Ba* where knowledge is created and shared through social media is needed. Nonaka and Takeuchi (2001) suggest a knowledge creating model with four stages of knowledge creation: socialisation, externalisation, combination, and internalisation. This is based on ever repeating and spiralling knowledge creation processes (Ngulube and Lwoga, 2007). It is illustrated in Figure 3 as the SECI model of Nonaka and Takeuchi (1995).

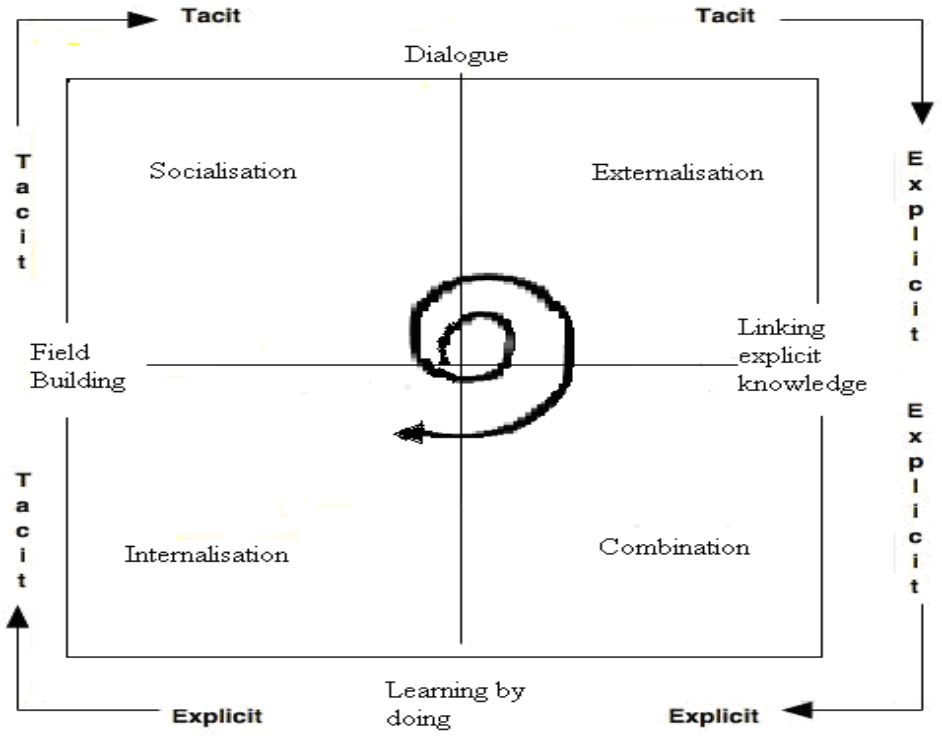
According to Nonaka and Konno (1998: 40):

> *Ba* can be thought of as a shared space for emerging relationships. This space can be physical (e.g., office, dispersed business space), virtual (e.g., e-mail, teleconference), mental (e.g., shared experiences, ideas, ideals), or any combination of them. What differentiates *Ba* from ordinary human interaction is the concept of knowledge creation. *Ba* provides a platform for advancing individual and/or collective knowledge. It is from such a platform that a transcendental perspective integrates all information needed. *Ba* may also be thought of as the recognition of the self in all. According to the theory of

existentialism, *Ba* is a context which harbors meaning. Thus, we consider *Ba* to be a shared space that serves as a foundation for knowledge creation.

Thus, spaces are *Ba* and each knowledge conversion mode is associated with its own *Ba*.

Figure 3: The SECI Model



Nonaka and Takeuchi (1995: 71-72)

In this economic school, organizations are seen as "dynamic learning environments, communities of practice and informal learning and interaction and underlying issues of organisational politics and culture…" (Vasconcelos, 2008: 426). Rowley (2001: 235) holds a similar view and says that an organization:

> needs a culture that not only ensures that knowledge is valued as a resource, and is recognised as a resource, but which goes one step further and emphasises the role of knowledge in supporting individual and organisational learning.

This characteristic is investigated by the questionnaire (see Appendix F), and through the observation protocol (see Appendix H).

Recognizing knowledge as an economic resource depends on the leadership, goals, and management of an organization. Rowley (1999) refers to knowledge rather than capital or labour as the only meaningful economic resource in the knowledge society. Argyris (1993), Baskerville and Dulipovici (2006), and Stankosky (2005) see knowledge a strategically significant resource of the organization that depends on organizational culture, organizational identity and policies, documents, routines, employees and systems. Rowley (1999) points out the weakness of many organizations which are unable to function on a knowledge basis due to the fact that "they have learning disabilities" (Rowley, 1999: 416), and Jain (2007) echoes similar sentiments about the importance of a learning organization to KM. Baskerville and Dulipovici (2006: 91) put emphasis on the same point by indicating that a "knowledge culture values learning and creativity". In addition, in this perspective, Rowley (2002: 435) points out the importance of KM as "associated with the leverage of the value generation capacity of an organization".

From the description of the SECI model of Nonaka and Takeuchi (1995, 2001), it appears that tacit and explicit knowledge are two diverse concepts. This is not necessarily the case as the spirals have a tendency to gradually move from one to the other. Gao, Li and Clarke (2008) believe that tacit knowledge and implicit knowledge are not mutually exclusive. In fact, according to Tredinnick (2006), "the concepts of tacit and explicit knowledge themselves suggest that the transformation of knowledge into information is simply a matter of codification", and librarians possess the requisite skills for codifying information. Gueldenberg and Helting (2007: 118) propose that "interaction between tacit and explicit knowledge becomes possible as the process character abolishes the notion that these two kinds of knowledge are diametrically opposed". They see tacit knowledge as referring to the context, field or source from which more forms of explicit knowing evolve, and thus, they are complementary to each other. Materska (2004: 142) suggests that tacit knowledge comes from "collaboration, innovation and sharing".

2.6.2 Technocentric school

The technocentric perspective focuses on technology in controlling and protecting information and knowledge. Information or management technologies are the focus in their function as supportive of the tasks of employees (Lloria, 2008). In this view, information communication technologies (ICTs) are a cornerstone in facilitating KM practice (Stankosky, 2005). Rowley (2003: 434) refers to it as the "information processing model". The focus is on managing knowledge (Lloria, 2008), the capture and codification of information through information technologies. In this school, there is information management focus (Vasconcelos, 2008). KM is viewed as "enacted blueprints" (Lloria, 2008: 86).

The technocentric view appears to put technology ahead of humans. However, Lloria (2008) sees a tendency towards including the human factor and suggests that this emphasis is American, and it incorporates the culture of the firm. Consensus among researchers is that in support of KM initiatives, information technology can enable rapid search, access and retrieval of the information which has been captured and retained, and can support collaboration and communication between organizational members (Abell, 2000; Jain, 2007; Ngulube and Lwoga, 2007; Singh, 2007;Tellis, 1997b; Yeh, Lai and Ho, 2006).

2.6.3 Behavioural school

A behavioural perspective implies the way that humans react to the environment. In this case, it refers to the way they behave at MCNY as determining how knowledge is managed. That includes intellectual and social interaction through social media (Lloria, 2008). According to Lloria (2008), this school has a European focus which puts social and intellectual capital as strategic resources, organizational assets. While Rowley (2003: 434) sees it as the "human centric model", Stankosky (2005) categorises it as a third KM pillar of learning. Baskerville and Dulipovici (2006), and Holmen (2005) regard intellectual capital as protected commercial rights and intellectual property. Baskerville

and Dulipovici (2006: 86) state that “intellectual property extends to copyrights, patents, trade secrets, and other proprietary rights”.

This school is a kind of community of practice model where there is continuous learning and informal information exchange which is enhanced by the availability of knowledge retained and accessible from within as well as outside the organization. It also recognizes that the perceived usefulness of the individual contributions and teamwork reinforce KM efforts (Kulkarni, Ravindran, and Freeze, 2006). Lloria (2008: 82) suggests that in this approach, “the community is recognized as a fundamental context for sharing knowledge with trust as its enabler”.

In the context of wikis such as the Wikipedia, in a library setup, there would be more quality control to ensure the authenticity of information. This indicates that much as technology is an enabler and a facilitator, the human factor is still essential, that is, one cannot declare a strict adherence to the technocentric school, for example, with nothing to do with the others. Of concern to libraries, however, is whether investing in social networking technologies does in fact enhance the value and quality of library service, especially bearing in mind that it is not necessarily every library user who has converted to the use of Web 2.0 technologies.

The need to use KM principles discussed in this instance as the economic, technocentric, and behavioural schools of thought on KM has created an awareness for implementing KM practices that enable the utilisation of skills and competencies and survival in an information and knowledge driven environment. In uncovering KM practices, the questionnaire (see Appendix F) and interviews (see Appendix G) investigated practices that include trust, knowledge retention, information and knowledge exchange, collaboration, and interaction at MCNY.

2.7 Knowledge management practices

Practices refer to the way ideas are translated into action in the process of accomplishing job functions. KM practices include the understanding of knowledge management: knowledge generation, knowledge acquisition, knowledge organization, knowledge storage, knowledge transfer, knowledge sharing, and knowledge retention (Branin, 2003; Daud, Rahim and Alimun, 2008; Davenport and Prusak, 1998; Jain, 2007; Jashapara, 2005; Lee, 2005; Lloria, 2008; McAdam and McCreedy, 1999; McManus and Loughridge, 2002; Nonaka and Takeuchi, 1995; Nonaka, Toyama and Konno, 2000; Rowley, 2003).

KM practices are viewed as having the potential to make libraries more relevant to their parent organizations and their users (Sarrafzadeh, Martin and Hazeri, 2006) to avoid the Panda Syndrome (that is, the state of being highly loved, and nearing extinction). According to Singh (2007: 177):

> information professionals need to develop the capabilities to survive in a knowledge-based society, but at the same time, organizations also need to increase investment and put more effort into ensuring that the information and knowledge available in databases, patents, trade secrets or in the minds of people is fully utilized and translated into products and services that give value to the organization

Jain (2007: 382), sharing the same view says "academic libraries and their associated institutions can work in close relationship to collaborate, share, and disseminate knowledge".

It is important for an organization to have a clear understanding of what KM means to its operations if it needs to consider using those KM practices that enhance efficiency and lend value to organizational knowledge. These practices include knowledge generation which encompasses activities that bring to light all knowledge that is new to a group or to an individual. That comprises of the exploitation of existing knowledge to create new knowledge, or finding new knowledge through interacting and collaborating with other individuals or systems (Nonaka, 1991; Nonaka and Takeuchi, 1995; Nonaka and Teece,

2001). This process therefore involves the acquisition of knowledge for it to be successful. The acquired knowledge is of limited value if it is not organized and stored for easy retrieval. Once it is available for retrieval, there is need to have systems that enable its sharing and transfer. In other words, a process of knowledge retention is the result when an organization is able to facilitate the capture and transfer of both formal and informal knowledge through knowledge networking, thereby using the available intellectual capital to its advantage.

KM affects the organization's strategic planning, its ability to meet its goals and objectives, and its projection on how best to use the services and knowledge products for the future (Stankosky, 2005). Seeing as these processes involve people in the organizations, and in this case, a College, there can be real barriers to KM success. They include the fact that KM may not necessarily be a way of doing daily business therefore policy that could guide it does not exist, fear of adopting new or different ways of doing things that causes human resistance, lack of appropriate organizational infrastructure to handle some KM practices, and it may be deemed unsuitable for some settings. This view concurs with the suggestion made by Singh and Kant (2008) that KM barriers include the lack of top management commitment, lack of technological infrastructure, lack of clearly defined methods or processes for KM practice, lack of organizational structure that supports a KM strategy, lack of organizational culture, lack of motivation and rewards, staff retirement, lack of ownership of problem, and staff turnover. Despite these barriers, the modern information environment that includes a wide variety of information, information providers and platforms for doing so has made it necessary for organizations, including libraries, to consider using KM practices to survive.

Advantages of using KM practices include the fact that they help organizations to refocus on using their already existing knowledge, they create the environment for innovation rather than limiting themselves to best practices solutions only, they enable convergence towards knowledge portals rather than separate silos of knowledge in an organization, and they promote interconnectedness among departments, employees, and systems in an organization. Kidwell, Vander Linde and Johnson (2000: 31) suggest that in an academic

institution, knowledge management practices "can lead to better decision-making capabilities, reduced "product" development cycle time (for example, curriculum development and research), improved academic and administrative services, and reduced costs". This approach has been termed by some authors, such as Branin (2003), Chase (1998), Hillenbrand (2005), and Rowley (2003), a paradigm shift. The paradigm shift in library practice can be put into perspective by providing the historical development of library services first.

2.8 Development of library services

The historical development of library service helps understand the paradigm shift and the reason for considering KM in the information environment of today. The transition that Hillenbrand (2005) refers to as the "information age" to the "age of knowledge" is described as developing from "collection development, collection management to knowledge management" by Branin (2003: 44) in three stages discussed below.

2.8.1 Collection development: 1950-1975

This stage was characterized by collection building through acquisition and selection. It:

> was the era of scouring in-print and out-of-print book vendor catalogs, clearing out the inventories of book stores, raiding foreign libraries, and international book buying trips. Print material, in the form of books, journals, and manuscripts, was pretty much the exclusive, or at least the predominant, medium for library acquisitions (Branin, 2003: 42).

At this point, there was a rapid growth in scholarship and libraries, especially mathematical and scientific journals. At the same time in the United States, the government increased research funding.

2.8.2 Collection management: 1975-2000

The explosion in literature was not matched by budget expansion. Technology took a sharp improvement, so that digital technology came to the forefront. Use of the internet became a way of life. Libraries "emphasized "management" over "development" in the collections field of librarianship" (Branin, 2003: 43). Focus shifted to more than collection development policy to include materials budget allocation, collection analysis, many use and user studies.

Due to changing technology, it became important to make sure to train and organize collection managers. Issues of preservation of old material, as well as life span of new digitised material came to the fore-front of discussions. The fact that no library could collect every library material needed by its users led to more efforts at cooperative collection development, such as Online Computer Library Center (OCLC) (2009), OhioLINK (Ohio Library and Information Network) (2009), GAELIC (Gauteng and Environs Library Consortium) (2009), Washington Research Library Consortium (2009), to name but a few.

2.8.3 Knowledge management: 2000 onwards

With the new millennium came new digital information opportunities and competition. It is triggered by the realities in libraries which include library storage needs, overcrowded shelving conditions, poor storage conditions, cost saving. It has become less centralized, especially with the increases in the social consumer internet. It has become necessary to use the technology from the internet to reach out to library users. Thus, libraries now use blogs, wikis, instant messaging, and other platforms that appeal to the modern consumer. There is now the question of "in an information economy or knowledge economy, who holds the keys to essential activity?" (Abram, 2008).

The viewpoint of Glazier and Grover (2002: 322) which links "the individual, society, and both discovered and undiscovered knowledge in an articulated open system" shows a

persuasion towards KM concepts in library practice. The paradigm shift from the modern era to the post-modern era would therefore be as defined by Hillenbrand (2005):

- *the modern era* - the age of science; enlightenment; the Newtonian world view characterised by order, predictability, objectivity, rationality, neutrality; with librarians as 'guardians of truth' and libraries as 'temples of knowledge'; 'knowledge is power'; information science.
- *the postmodern era* - the networked hypermedia information age; post-structuralist world view characterised by subjectivity, relativity, chaos, unpredictability; knowledge is socially constructed and context-dependent; 'sharing knowledge is power'; knowledge management

2.9 Paradigm shift in library science

Theories about a discipline tend to vary in focus, and it should be possible to group them according to what they stand for, as research progresses. This way it is possible to group them into paradigms. Glazier and Grover (2002) suggest that as theories develop, paradigms become obvious. Paradigms are less complicated to discuss because they are then seen as world views (Creswell and Plano Clark, 2007: 20; Glazier and Grover, 2002). These world views have a tendency to shift over time for many reasons. The need to investigate a paradigm shift required first considering if there is a viable library science theory, or if there is none, what state the discipline is in, and then the historical development of library service. From the theories discussed above, it appears that library science theory continues to develop. Glazier and Grover (2002) express the idea that the way towards paradigm change is through the process of theory building and theory replication.

In a discipline, “it is important to have a paradigm to guide the design of research” (Fritze, 2004). Library science refers to “the principles and practices of library operation and administration, and their study” (online *Encyclopædia Britannica, 2008*). A library paradigm is a broad set of theoretical views about the library world. The definition of a

paradigm that is used in this research is in agreement with Creswell and Plano Clark (2007: 20) who call it a:

> worldview … because many definitions exist for paradigm. All research needs a foundation for its enquiry, and inquirers need to be aware of the implicit worldviews they bring to their studies.

Theory is more systematic and is open to being tested, reviewed, modified, and adjusted, than a paradigm. This is the reason that it has been important to consider some of the theories that exist in library science, before discussing if there is indeed a paradigm shift.

Librarians define their profession as a science. The term featured for the first time with the publication of a book by Ranganathan (1931) called *The Five Laws of Library Science*. But then, according to Foucault (1997: 25), even:

> 'literature' and 'politics' are recent categories, which can be applied to medieval culture, or even classical culture, only by a retrospective hypothesis, and by an interplay of formal analogies or semantic resemblances.

The use of paradigms is the systematic method of knowledge production used in the sciences, with the scientific paradigm being a set of shared concepts, resulting in a sense of intellectual progress. Intellectual progress is achieved when paradigms or models are proposed, tested, changed, and tested again. In Kuhn's view (1970: 10):

> science, investigative work is organised by paradigms, or intellectual structures, examples being Ptolemaic astronomy (or Copernican astronomy), Aristotelian dynamics (or Newtonian physics), Einsteinian relativity, Darwinian evolution, and so on. Scientists work within such a paradigm applying its rules to specific cases, relying on its structure to devise theoretical explanations, seeking its predictions, and generally doing work that refines or elaborates the paradigm.

Thus, paradigms can be refuted, can change over time, and are determined by the practitioners involved as they try to solve problems (Budd, 2006).

The theories discussed in section 2.5 above all relate to library functions and practice in their suggested applicability, but do not address the library science discipline as a whole. It is evident that library research and practice is moving from a library - centred approach

to an information-centred one, and that is an environment for the eventual development of strong, definite theory or theories. The change in perspective is a paradigm shift. The concept of a paradigm shift has also been mentioned by Chase (1998: 22) in reference to the library now operating as an "intelligent enterprise". It happens when fundamentally significant change takes place in the way things are done, caused and necessitated by change agents such as rapid technological advances, to a different worldview.

Librarians are currently busying themselves with research and practice which helps in re-focusing because of a fast changing information environment. According to Kuhn (1970: 10), "men whose research is based on shared paradigms are committed to the same rules and practice for normal science". Thus, the current trend in library practice deserves to be considered in terms of a paradigm shift, and dimensions of paradigms differ according to the discipline in question. The same view is shared by Floridi (2002) when he refers to a new informational paradigm that has come about due to the IT revolution. Cornelius (1996: 131) suggests that "Kuhnian perspectives may be considered, but because they are primarily concerned with science, they cannot be imported wholesale". In this respect, because the librarianship discipline is defined as a science, use of Kuhn's perspective in the discussion is relevant. Traditional library practice has been inevitably affected by modern technology and changed information consumption habits, and in many instances, librarians are looking into KM research in their efforts to find practices that are relevant.

As library science becomes more technical, there are more instances of experiments, empirical studies to improve library service. In his book, *The Structure of Scientific Revolutions*, Kuhn (1970) discusses paradigms as they relate to scientific discovery and evolution. This is the work which popularised the term 'paradigm shift.' Kuhn questioned the traditional conception of scientific progress as a gradual, cumulative acquisition of knowledge based on rationally chosen experimental frameworks. Instead, he argued that the paradigm determines the kinds of experiments scientists perform, the types of questions they ask, and the problems they consider important. There seems to be a complimentary relationship between the two views.

Change in the orientation of a discipline cannot be put in “rigid classifications but rather organizing frameworks to use in different stances” (Creswell and Plano Clark, 2007: 22). This appears to be the stage the library world has reached. Hillenbrand (2005) refers to a 'Copernican revolution' in information science akin to the paradigm shift from the Ptolemaic model of the earth as centre of the universe to the Copernican revelation of the earth revolving around the sun. Rowley (2003: 437) asserts that “the paradigm shift from librarianship to KM is one of scale and perspective”.

A shift in the paradigm alters the fundamental concepts underlying research and inspires new standards of evidence, new research techniques, and new pathways of theory and experiment that are radically incommensurate with the old ones (*Encyclopædia Britannica,* 2008). According to Creswell and Plano Clark (2007: 21) “researchers tend to categorize the different types of worldviews and to describe characteristics that they will have in common”. Wilson and Halpin (2006) express this paradigm shift in terms of the emergence of new technology which now defines what librarianship is about, as contrasted with the traditionalist view where the focus was on reference desk services only. Hillenbrand (2005) also says “we need to shift our professional focus from the traditional 'guardian of knowledge' to the more modern 'intermediary' to that of the postmodern 'enabler'”.

The fact that the next generation of librarians sees the profession differently diminishes the prevalence of the older schools, which may gradually disappear. The user-centred approach which requires the librarian to put more focus on users, communicating with them, and encouraging discourse makes Foucault’s “Unities of Discourse” (1997: 23) analysis relevant, though not comprehensive enough to stand alone. The unities of discourse refer to the unity or continuity in what we write and/ or say. This disappearance of older schools is caused mainly by the recently qualified librarians’ conversion to the new paradigm. The realization that KM principles need to be considered in library practice because of the competition with alternative sources of information and methods of information dissemination and consumption which academics are now exposed to is a paradigm shift in library science. Rowley (2003: 433) suggests that KM is “in conceptual

terms, a paradigm". If there is indeed a paradigm shift, then it is important to find out what KM refers to in libraries and how its principles have been applied.

2.10 Knowledge management in libraries

This literature review was used to consider works that have discussed KM activities in library situations. The fact that there is often a lack of demarcation between the meanings of information and knowledge is the reason that the terms are defined in section 1.1.2 of Chapter One. According to the empirical study of Jain (2007), whether libraries deal with KM or information management is often unclear, especially as these are concepts that originate from the business perspective. Jashapara (2005: 144) suggests that "much greater philosophical introspection is required to understand the nature of knowledge before it can be managed in organizations".

Barquin (2001) described KM as a process, with phases and components, embedded in time, and there is more than one approach and different structures and architectures to this process, as well as expected outcomes and performance to be measured. This view further sees the importance of interpreting collective intelligence, that is, a community of participants involved and hence the need for identifying ownership and source of the knowledge, as well as for providing mechanisms and incentives to sharing knowledge. The same point is expressed by Singh (2007:172) who is of the view that KM "implies the process of transforming information and intellectual assets into enduring value". This is in line with the behavioural school of KM.

Research papers that deal with KM in libraries mainly try to define it, because of the lack of a standard or stable definition. It appears that the domain of the private sector which uses electronic and records management systems, such as those available in the KM software directory at http://www.capterra.com/knowledge-management-software, have a different, commercial approach from that of academic librarians. The private sector approach is directly linked to efficiency in profit making, while the academic library approach tends to be a way of getting explicit and tacit knowledge organized for the sake

of supporting and enhancing the quality of education services. According to Singh (2007), there are no simple answers to what constitutes KM in libraries because in a diverse and changing environment, its nature is likely to be ever-changing.

Maponya (2004) suggests that KM practices aim to draw out the tacit knowledge people have. Understanding the practices requires a close look at library policies and strategies, leadership, knowledge capturing and acquisition, and knowledge sharing. To be effective, it is important for the librarian to understand the context that the information is required, as well as organizing the information (re-packaging) in a manner most useful to the users, at the same time learning from previous experiences and situations, and as a result be able to anticipate user requirements. This knowledge then needs to be retained so that continuity remains even when the creator leaves the organization. Eventually, a knowledge bank (Branin, 2003), or repository (Bailey, 2005), or portal may be the result.

As a way of helping librarians understand the concept of KM better, some library schools, for example, London Metropolitan University (UK), University of Johannesburg (UJ), and University of Stellenbosch (US) now train graduates to bring skills of organization, classification, evaluation, training and synthesis to transform data repositories into value-added information sources that can constitute knowledge and knowledge services. Hazeri and Martin (2009) as well as Rehman and Chaudhry (2005) suggest that library schools enter into collaborative approaches for KM education with business schools and industry. Library bodies, such as the American Library Association and its various sections, and the 2008 SLA Annual Conference KM-Sponsored Programs, also provide continuous instruction for librarians to equip them with requisite skills to understand what KM stands for. In this study, question five in the questionnaire (see Appendix F) seeks to find out what is understood by the concept of KM at MCNY.

The KM discussion in libraries sometimes revolves around document management, information management, records management and KM and whether and how they are different (Srikantaiah and Koenig, 2000); the role that technology plays in knowledge-sharing and Web 2.0 social networking technology such as blogs, real simple syndication

(RSS), chat (Anderson, 2007b; Bell and Shank, 2004; Carpenter and Steiner, 2005; Coyle, 2007; Dempsey, 2006; Fichter; 2005; Foo and Ng, 2008; Harris and Lessick, 2007; Macgregor and McCulloch, 2006); and whether librarians continue to be relegated to customary/ inherited library services, or their capabilities are not fully utilized in contexts that involve KM. The research of Maponya (2004: 34) refers to academic librarians' need to be involved in KM activities such as "creating, capturing, sharing and utilising knowledge to achieve the library goals". Wen (2005) makes the suggestion that the use of KM practices can help in the processes of capturing, collecting, organizing, and disseminating information.

Mahnke (2007: 2) asserts that KM "is about sharing knowledge with others... a new way of knowledge sharing has emerged: the Web 2.0. It is time for librarians and KM experts to explore this phenomenon and see what it means for the purpose of KM". This view tends towards both the behavioural and the technocentric schools. The place of social networking technologies has brought librarians into thinking where that technology can best be used. Green (2008: 10) suggests the creation of "social libraries" as places where traditional library practices and modern KM technologies operate together for collective social wisdom. This is much like the *Ba* concept of Nonaka and Konno (1998) as well as Nonaka, Toyama and Konno (2000), which refers to the creation of a context for knowledge creation. In other words, librarians have ceased to be "just custodians or gatekeepers of information" (Kim, 1999). Green (2008: 13) says that "the librarian must be at the centre of managing information, and the tools used must be designed to facilitate this requirement". A good understanding of the meaning of KM application to libraries is therefore essential.

It is important for traditional libraries to go through the process of KM instead of rebranding themselves as knowledge practitioners/ centres, as their role sometimes stays the same because it tends to be a name change only. Lack of change explains why a library's future can become bleak if its educational institution continues to shape education and conduct around its traditional domain (Abell, 2000). On its part, the library has to find creative ways of remaining relevant to the twenty first century use (Parker,

Nitse and Flowers, 2005). A similar point is also expressed by Branin (2003:48), from his survey research, which suggests that:

> from an academic research librarian perspective, the simplest way to describe what we are trying to do is say that we are extending the expertise of librarians to manage all types of information, not just the structured, published information we have traditionally been asked to collect, organize, and preserve.

The current fast changing information environment has created a need for library service to be of high quality. It is therefore essential that while placing importance on information services, instructional tasks and interactions with patrons (Lynch and Smith, 2001), move from being service-oriented to being value-oriented (Sarrafzadeh, Martin and Hazeri, 2006). KM is regarded as creating value from knowledge, information and people (Weerasinghe, 2006). In line with the economic school of KM, Jain (2007: 379), Jashapara (2005), and White (2004) point to the need for a knowledge environment which is based on strategic planning, and knowledge needs to be considered a strategic resource. Jain (2007: 382), on value addition, says that the "partnership of librarians and academics will transform librarians' status from service-oriented to value-oriented".

Value-orientation happens when the library streamlines its day-to-day operations to improve visibility and involvement in the larger organization, and assume a leadership role in helping to capture institutional memory (Gandhi, 2004; Patrick and Dotsika, 2007; Rowley, 2003; Sarrafzadeh, Martin and Hazeri, 2006). According to Zhang, Tian and Qi (2006: 227), institutional memory (OM) consists of:

> documentary materials, regulations, procedures, conventions and organizational culture, provides necessary knowledge for the organization. In the process of practice, every organization develops OM, thus guiding present activities.

This also means that the leadership of the organization has to be aware of the importance of KM in the library, and have its essentials incorporated into the organization's strategic plan, and the strategic goal (Stankosky, 2005). That is executive support which results in a KM policy that Jain (2007: 379) refers to as the road map to answer questions such as

"what, why, how, and who" of KM. That approach results in systemic change, not isolated change in the operations of library alone.

In fact, Skyrme (2004) pointed out that:

> Information professionals must consistently connect to corporate "hot buttons" and understand how their output is used to support business objectives and priorities. Simply serving people who make/ request information from you is insufficient. It may even be irrelevant, if there is no clear link to a business outcome. Ignore the strategic thrusts of your organisation and you could find yourself outside it!

Singh (2007: 175) echoes the same sentiments expressed by Skyrme (2004) and notes that:

> …in the information and knowledge-based society, information professionals are expected to be more dynamic and competent to deal with the influx of information and manage organisational information resources and intellectual assets…For this, information professionals need to develop highly dynamic knowledge management skills and strategies. They should have a clear understanding of various knowledge management processes such as knowledge creation, capture, retention transfer and sharing in addition to having the analytical ability to identify and leverage existing knowledge.

Giving incentives to individuals for contributing to KM activities has been proved to be an effective way of encouraging staff to participate in KM activities. This is a topic referred to by Weddell (2008: 152) when she brings out the importance of "incentives to stay and develop within the company". It also comes out in a case study reporting on the success of a Web 2.0 programme by Gross and Leslie (2008: 795) as management introduced "face-to-face discussions in the form of an introductory seminar, a half-way morning tea, and a final celebration with certificates of completion". According to Wen (2005):

> an organizational culture for sharing of knowledge and expertise should be established with appropriate rewards and incentives. Those staff members who

> share their tacit knowledge and experiences through writing, publishing, lecturing, tutoring, or mentoring should be appropriately recognized and rewarded.

To reiterate the same point, Sharma and Chowdhury (2007) discuss "collaboration, team spirit, rewards and recognitions and staff relationship with their superiors, peers and subordinates" as methods of discovering where knowledge gaps exist. These studies confirm the view of Barquin (2001) who also believes in giving incentives to encourage participation in KM activities.

Effective information retrieval and service requires the professional mix of knowledge of information, users, and KM "cannot be efficient without educated customers to speak to. This is where information literacy comes into the focus of KM" (Mahnke, 2007: 4) and information technology. Information literacy is important to KM because of its focus on sharing and learning from information. This way, it facilitates KM practices.

To a large extent, IT is the tool of choice to make KM easier (Abell, 2000; Jain, 2007; Ngulube and Lwoga, 2007; Singh, 2007; Tellis, 1997b) because it is convenient in maintaining explicit knowledge. It is "a key enabler in KM, but is not KM in itself. It is a facilitator to provide faster access to knowledge or to share/transfer it among individuals" (Singh, 2007: 175), and this is in line with the views of the technocentric school of KM. This is the same point discussed by Schwarzwalder (1999: 65):

> the use of person-to-person collaboration as a means of knowledge dissemination illustrates that technology is not always necessary to developing knowledge management systems. Technology is an expediter; people and process are vital.

According to Green (2008: 13), it is librarians who:

> create the environment necessary to publish content and to develop knowledge communities around content. This isn't as simple as buying an Integrated Library System (ILS) and bolting on social tools.

Koenig (2003) credits the flow of formal and informal information up, down and across the enterprise as the source for improvements in operational productivity. This can well apply to an academic library as confirmed by White's (2004) study of KM practice at the

Oxford University Libraries, and a separate study by Maponya (2004) at the University of Natal, Pietmaritzburg Libraries.

Putting the KM research of Stankosky (2005) in the library perspective, one sees that it is focused on technology (which is a concern of a modern library), leadership (library leadership and where it places KM principles), organization (organizational objectives and how the library goals support them), and learning (the library as a learning department/ organization). These core pillars are interrelated, and are at the heart of most activities within KM. Library practice based on KM principles and practice has the potential to allow for the study of library and information variables, their measurement and evaluation, the creation, retention, and dissemination of knowledge. It appears to be more comprehensive than other models that focus only on circulation, or technical services, or reference.

This literature review has pointed to the fact that to become aware of a KM strategy in a library, an assessment of the current situation needs to be carried out by highlighting existing KM activities and experience, outlining the benefits, explaining how these can be built upon, and exposing barriers to further progress (April, 2002). This brings out how current KM practice (or lack of it) affects the ability of all those involved in library service to meet intended goals, and how it affects the effectiveness of individuals and teams, and to what extent professionals' culture, processes and systems currently act as enablers of, or barriers to, good KM practice (McManus and Loughridge, 2002). Jain (2007: 379) suggests "mapping knowledge or knowledge gap exercise. Knowledge mapping can identify organisational knowledge assets as well as knowledge gaps". This exercise helps in the eventual measuring of the effectiveness and success of implementing KM tools and principles.

The view expressed in literature sources consulted, which the researcher is in agreement with, points to the fact that librarians possess skills that are vital in KM, but they need to widen their skills set and think more openly so as to understand the changing information environment. There is no agreement as to the extent to which librarians can be viewed as

KM practitioners, but consensus exists in relation to the importance of integrating KM practices into their work. Literature also indicates that KM implies that librarians have to deal with a broader range of information resources and services than traditionally; they have to encourage a culture and environment for active learning and information sharing (especially as they are a part of larger institutions which affect the way the library operates); and they have to collaborate much more proactively and deeply with other libraries, information technology services, and users. In this study, specific studies and case studies of where KM has been considered are useful too as they indicate that it is a practical mode of operation that some libraries are considering, or have considered using.

2.11 Studies related to knowledge management practices in libraries

A case study of Jantz (2001) at Rutgers University, New Jersey, suggests that it is possible to apply KM principles in a library. A tool for capturing knowledge was developed, with the purpose of "information capture, auditing of information, maintaining and updating the technology platform, marketing, education and training" (Jantz, 2001: 40). Besides the capture and sharing of knowledge, mention is also made of the importance of understanding the KM process and cultural issues in an organization as essential for the organization to benefit from KM. Expressing agreement with the same idea, the Network of Alabama Academic Library's network case study of Graham, Skaggs and Stevens (2005: 344) reminds librarians to "remember the liaison commandment and look to see how you can interest the rest of your college or university community to be involved". This is a point also raised by Skyrme (2004) on the need for information professionals to stay connected to the organizational decision makers.

Hayes (2007: 228), from the University of Edinburg in Scotland experience, suggests the creation of a strategic plan that focuses on KM principles. In her case:

> The first objective relates to the provision of high quality, sharable, relevant and authoritative information for teaching, learning, research and management. The second relates to efficient and effective information and IT infrastructures,

systems and services; and the third to developing a culture that supports collaboration and sharing knowledge as a routine way of working.

This is where executive support as envisioned by Gandhi (2004), Jain (2007), and Stankosky (2005) is seen in practice. The concept of a strategic plan being part of the reason for success is also expressed by White (2004) in a case study at the Oxford University Library Service (OULS).

White (2004), from a study on KM in an academic library at the OULS, supports the idea that KM practices can enhance the quality of library service. The study was intended to show the need to include KM in library strategy to retain expertise for the benefit of staff and users, to "provide an additional tool in assessing staff's perception of change, knowledge creation and sharing at OULS" (White, 2004: 3). The difference from MCNY is that the OULS is made up of 30 libraries, while MCNY is a single one. However, the categories of staff included - librarians, administrators, IT personnel, front line and staff workers - in the study provided a working guideline of what categories of people to include in studying the MCNY case. The research was also done during a particular semester, as was in this case. The much smaller size of MCNY makes it important to get information from more individuals that do not work in the library but whose presence at MCNY impacts library operations.

In addition to the concept of librarians operating as team members, Robertson and Sullivan (2000) suggest digital libraries as vehicles of systemic educational change. This is because technology in digital libraries is an enabler in the modern information supply chain (Abell, 2000; Jain, 2007; Singh, 2007), and librarians must thus be skilled at the technical aspects of the job. Studies carried out at the Eskind Biomedical Library in Nashville, Tennessee (Williams *et al.,* 2004), as well as at the Perseus Digital Library at Tufts University (Rydberg-Cox *et al.,* 2000) show examples of instances where KM practice is addressed in digital library set-ups because library practice is having a tendency towards an increased transformation into digital libraries.

Hamid and Nayan (2007) performed a preliminary study of KM in a public library, and subsequently, Hamid *et al*., (2007) did a KM adoption and implementation readiness case study of the National Library of Malaysia (NLM). The study investigated the status of KM in NLM with the objective of discovering how the organization went about creating, disseminating and applying knowledge internally. It also tried to assess whether the working environment in the NLM supported the adoption and implementation of KM. The study revealed that a clear organizational strategy and the right understanding of KM potentials and challenges could be described as the basic formula for success. It also revealed the importance of capturing tacit knowledge that resides in employees' heads. The recommendations that resulted from the study included the need to define and document the organization's policy for KM, documenting best practices and expertise required for KM practice, and a system that allows for the easy location of specific knowledge and expertise.

The examples used give the impression that KM happens only in digital libraries. However, libraries that are not equipped with sophisticated technology can also use KM practice in limited ways. Ruggles (1997: 3) points out that paper and pen can be used to generate, codify and transfer knowledge too. Consensus from literature and case studies is that technology is an expediter, therefore it makes sense to, for long term survival, think of investing in digital technology. This is because the technology enables faster information and knowledge processing as well as more interactivity.

Having discussed the foundations of KM as a theoretical framework on which to ground this study, and looked at instances where it has been used in libraries in order to study its relevance or applicability to the MCNY library, it has become clearer that its practices are effective if implemented in the modern information environment. While Hazlett, McAdam and Gallagher (2005: 40) are of the view that:

> the current state of KM is akin to the Kuhnian pre-science, and … future progress of the field may be explicated by Kuhn's model of scientific development… and there is a growing disquiet with faddish elements of KM and a need for more in-depth theoretical approaches,

Lloria (2008: 83) is of the impression that "what began as three divergent approaches to knowledge management are coming together in this new era of synthesis to form a universal foundation". Because KM was introduced as part of trying to find ways of enhancing library science practice, it is important to evaluate and synthesize library science research theories to give insight into the validity and viability of introducing KM principles.

2.12 Management styles and knowledge management

Management styles are important because they determine the success of KM practice in an organization, in this case, an academic library. Different organizational cultures have a tendency towards different management styles. Besides those cultures, individual managers project management styles differently. These styles may be autocratic, consultative, or authoritarian. The nature of the product the organization stands for is also critical to how management encourages KM processes. The key cultural drivers include maintaining open communication, encouraging deep reflection and learning, creative discourse and belief justification. Boisot (1998: 182) refers to the process of organizational learning that is initiated from management to include the whole organization. According to Srivastava and Bhatnagar (2008: 258), to enhance KM practice in an organization, what is important is "individual employee involvement and commitment, satisfaction, organisational citizenship behaviour"

Nonaka and Takeuchi (1995: 199) suggest that Japanese organizations and Western organizations create and manage knowledge differently. The different perspectives are the Japanese group-based focus, versus the Western individual-based style, as illustrated in Table 2. The view is based in a business environment, but serves to bring out important facts about the nature of management and its meaning for it in different types of organizations.

Table 2: Japanese versus Western Organizational Culture

Japanese organization	**Western organization**
Group-based	Individual-based
Tacit-knowledge –oriented	Explicit knowledge-based
Strong on socialisation and internalisation	Strong on externalisation and combination
Emphasis on experience	Emphasis on analysis
Dangers of "group think" and "overadaptation to the past success"	Danger of "paralysis by analysis"
Ambiguous organizational intention	Clear organizational intention
Group autonomy	Individual autonomy
Creative chaos through overlapping tasks	Creative chaos through individual differences
Frequent fluctuation from top management	Less fluctuation from top management
Redundancy of information	Less redundancy of information
Requisite variety through cross-functional teams	Requisite variety through individual differences

Nonaka and Takeuchi (1995: 199).

KM schools of thought or models exist within the context of a variety of management styles, and difference cultural and organizational circumstances. According to Al-hawari (2007), "style is a personal attribute and so knowledge management style varies from one manager to another, and may be influenced by the culture of their organisations". Ngulube and Lwoga (2007: 120) also point out that it is important to:

> think globally and act locally. European and Asian firms are different, but they have used similar knowledge management (KM) models with reasonable success. The knowledge creation and conversion model of Nonaka, Toyama and Konno (2000) is based on Japanese experiences but it is widely accepted in the West as a meaningful model for managing knowledge.

The tendency to place KM into distinct Western and Japanese styles seems inflexible. The assumption is that the Western way of thinking is very clear, distinct and consistently logical. Gueldenberg and Helting (2007) point out that Nonaka and Takeuchi (1995)'s views are based on the Cartesian explanation of human behaviour which is explained

mathematically. It postulates that "mathematical criteria of clarity, distinctness, and logical consistency are the ultimate test of meaningfulness and truth" (*Encyclopædia Britannica*, 2008). However, in the real world, every cultural orientation has its strengths and weaknesses, and the best fit is determined by how effectively the goals of the organization are communicated - Western, Japanese, European, or from any other part of the world. Spender and Scherer (2007: 8) also ask: "is anything left standing if Nonaka and Takeuchi's East-West contrast collapses?"

2.13 Knowledge management tools and techniques

KM tools that have been mentioned in Chapter One, which include Google books, Google mail, Google notebook, Google docs, Lotus Notes, Microsoft Exchange, and Business Objects, twitter, Facebook, MySpace, delicious.com all encourage the gathering and retrieval of information, allow storage of information, and its retrieval. Srikantaiah and Koenig (2000: 68) list information management tools as benchmarking and best practices, information or knowledge audits, intranets, notes and other groupware. Rao (2004: 2) agrees with this but is more elaborate and includes abstraction agents, authoring systems, blogging, clustering, content management, collaboration, collaborative filtering, creativity tools, data mining, document management, e-learning, groupware, intellectual property inventory, knowledge blogs, knowledge discovery, knowledge mapping, knowledge mobilisation, knowledge portals, metadata, online communities of practice, Skandia navigator, skill inventory, topic maps, and many more.

According to Ruggles (1997: 8) KM tools are "technologies, broadly defined, which enhance and enable knowledge generation, codification (know how), and transfer". Using them is intended to ease the burden of work and to allow resources to be utilised efficiently to accomplish the tasks for which they are most appropriate. Ngulube and Lwoga (2007: 121) confirm that KM tools "provide strategies that may be used to manage and integrate both tacit and explicit knowledge". The difference with information management tools is that information management tools are a subset of KM tools. This is

in agreement with the definition given above by Srikantaiah and Koenig (2000) when they include information audits in their definition.

Most of the operations that happen in the library, that is, generation, access, storage, and analysis of data, usually in the form of facts and figures are handled by information management tools. However, while information management tools include tools that also handle data and information, Ruggles (1997: 3) points out that:

> KM tools (for example, data warehouses, data search engines, data modelling tools) and information management (for example, automated search and retrieval agents and document management tools) are different because the latter do not capture the complexity of context and the richness of knowledge and are not robust enough to truly facilitate KM.

Knowledge management techniques are those activities associated with the use of KM tools. They encompass documenting both explicit and tacit knowledge, building knowledge repositories, organizing internal conferences and symposia, using social software for knowledge sharing and transfer, using e-mail, shared file systems and documentation storage, mentoring, and training programmes. Formally created methodologies or policies for using these techniques help make practice both systematic and systemic.

2.14 Synthesis and evaluation of theory

Most of the thoughts about KM which have been discussed in this chapter have roots in the commercial sector. Theory as it applies to library situations is still developing. However, it is still important to synthesize and evaluate the existing theory to understand it further, as well as create inroads into the development of that which is relevant to libraries.

There are characteristics to look out for in evaluating theory. These include the outline of the theory, who its proponents are, where and how it can be applied, whether or not it promises prediction, how global it is, whether or not the concepts used in it are

understood with ease in the context of the discipline, how easy it is to apply, and its applicability to one's research. These theories give an insight into what work has been happening in library science. They are important to the study of library science and the place of KM in a modern library.

Lloria (2008) summarizes the state of KM as being in four stages. Firstly:

> KM is related both to business practice and to research. As far as research is concerned, the authors who have studied this concept come from varying disciplines such as psychology, sociology, economy, engineering, computing or business management, among others. Each of these fields provides important insights into one aspect or another of knowledge management, although, on their own, none provides an integrating framework (Lloria, 2008: 79).

According to Nonaka and Teece (2001: 330), what is required is transdisciplinary research that goes beyond mere interdisciplinary research activity. What this says for KM in libraries is that librarians need to collaborate with other scholars for more transdisciplinary research. Library science scholars also need to develop academically and professionally while doing research to establish their own position and enhance the recognition of their profession as a science. This view is further emphasized by Hazeri and Martin (2009) who see a need for collaboration in KM education in the library and information sector with the business sector.

Secondly, Lloria (2008: 79) points out that:

> KM goes further than technology management or information management. Human intervention, learning and tacit knowledge, among others, are indispensable for getting the most out of knowledge.

In other words, the technocentric school, the economic school, and the behavioural school, are all a part of KM and are related. Emphasis on which one an organization assumes, to a large extent, depends on the type of organization, its goals and management style. The case study of Hayes (2007), for example, illustrates the involvement of people from different departments in the same university library towards KM practice, featuring

the human element, readiness to use technology, and interrelations in that organization. Aharony (2009: 29) suggests that, besides the users of the library:

> whether librarians use Web 2.0 is affected by personality characteristics (resistance to change, cognitive appraisal, empowerment, and extroversion) and computer expertise, motivation, importance, and inclination toward studying and integrating different applications of Web 2.0 in the future.

The human factor is implied in the critical realism theory, the fuzzy set theory, and the probability theory as they apply to user information seeking and use. It is an instance where an aspect of KM resonates with library science theory, but the theories do not address the librarian as a participant in the information seeking process, and that makes KM broader in spectrum. In the current study, the status of technology use in the organization, human involvement, the impact of social networking are all investigated by the questionnaire, observation, and a study of institutional documents.

Thirdly, Lloria (2008: 79) suggests that:

> KM is a broad concept, and is made up of different activities, all of which are related to the asset of knowledge. From among the related activities, we can underline identification, creation, development, sharing, transformation, retention, renovation, diffusion and application of knowledge use.

While the grand unified theory puts together all the functions of the library – publishing, selection and acquisitions, storage and preservation, and also includes the structure of knowledge and classification - it concentrates on the collection and circulation as central. It is based on the development of theories that relate to the different functions of the library, accounting for one activity in terms of others. This theory does not, however, address issues like the psychology of the users and librarians, organizational behaviour, interaction with other disciplines, and attitudinal studies (McGrath, 2002b). These are all concepts that are addressed in KM principles and theory.

Fourthly, (Lloria, 2008: 79) adds that:

> Knowledge is principally found in people and is developed through learning. Effective KM implies that such knowledge goes from being a human asset to

> being a business asset. In this process, we underline the importance of a definite commitment on the part of all members of the organization, a correct diffusion of knowledge in the firm and especially the successful incorporation of processes and systems, products and services so that knowledge becomes institutionalized in the firm and remains with its members.

The result of this approach is an enhanced value of knowledge. The library science theories that have been discussed are all service rather than value oriented. Value addition/ enhancement is a concept that the theories do not address. The questionnaire used in this study obtains the perceptions of the MCNY community about KM, as well as to understand to what extent it is a part of the culture of the College, for purposes of assessing the value of knowledge in the context of this case.

Lastly, Lloria, (2008: 79) says that:

> The objectives or strategic aims of knowledge management can be varied although, in general, they follow similar lines. Knowledge can be managed with the aim of developing new opportunities, creating value for the customer, obtaining competitive advantages or improving performance.

In other words, the suggestion here is that KM can be adapted to suit varying circumstances, such as the type of organization, the culture of the organization, and management styles used. The grounded theory is comparable to what KM does if considered from the point of investigating human information actions. The problem is that it is more a research method for deriving theory out of qualitative data than a real theory. It can actually be used as a tool in KM practice if theory formulated from data gathered translates into decision making in the library environment.

Having summarised KM with library science theories in context, the state of library science theory and practice can be summed up as evolving. This has become a necessity because of an environment of unprecedented technological and communication changes that requires librarians to re-focus and re-tool. Table 3 synthesizes and evaluates the library and KM theories that have been looked at in this chapter, juxtaposed with a view to consider KM principles for appropriateness to a library situation.

Table 3: Synthesis and evaluation of library science theory

Characteristics of theory	**Grounded Theory**	**Probability Theory**	**Fuzzy Theory**	**Grand Unified Theory**	**Critical Realism**	**KM**
Outline	Systematic generation of theory from data	Probability theory applied in the management of a library collection	Mathematical origins. Membership of a set is not discreet, but fuzzy	Every function of library practice varies and is dependent on another, and work should be towards their integration	Socio-cultural characteristics determine information seeking	Management origins with knowledge viewed as an asset that puts a company at operational advantage
Proponents	Glaser & Strauss (1967)	Urquhart (1956); Bensman (2007)	Zadeh (1965)	McGrath (1995; 2002)	Wikgren (2005)	Baskerville & Dulipovici (2006); Branin (2003); Daud, Rahim & Alimun (2008); Davenport & Prusak (1998); Jain (2007); Jashapara (2005); Lloria (2008; McAdam & McCreedy (1999); McManus & Loughridge (2002); Nonaka & Takeuchi (1995); Nonaka, Toyama & Konno (2000); Rowley (2003); Singh (2007);

						Spender & Scherer (2007); Stankosky (2005); Takeuchi (2001); Weerasinghe (2006); Wen (2005).
Applications	User-oriented studies Online learning	Interlibrary lending	Information retrieval Management of periodicals	Interrelationship of acquisitions, classification, storage & retrieval, classification, circulation, collections	Human information actions	Technical services, User oriented studies, Information capture, retention, retrieval and dissemination
Does it promise prediction and/ or control?	Yes	No	No	No	No	Yes
Is it global?	Yes	No	No	No	No	Yes
Are the concepts used n the theory well-understood in library science?	Yes	Yes	Not always	Yes	Yes	Yes
Does it promote prediction?	Yes	Not clear	Not clear	No	No	Yes
Is it easy to identify its variables?	Not easy	Yes	Not clear	Yes	No	Yes
Is it easy to see its applicability?	Yes	Yes	Yes	No	Yes	Yes
Is it practical for my research?	No	No	No	No	No	Yes

2.15 Chapter summary

In this chapter, a map of research literature was created for purposes of organizing the resources in a meaningful manner. The map was followed stage by stage as a guide to bring out the meaning of KM and its relevance to a library situation. Some studies that have been done previously were also looked at to find out if any of the findings are applicable to the current study. There was also an investigation into different schools of KM thought, as well as the relevance of different management styles to the way KM is practiced.

A look at library science theories was made with a view to understand how and where their frameworks are applicable in an environment that recognizes KM as a significant way of enhancing value and quality of service, and yet operating in a non-commercial organization. Web 2.0 social networking was also included in the discussion because it affects the way KM practices can be put into use in a library. The review of literature gave an opportunity to study what others have done in areas that are similar, though not necessarily identical to, one's area. While the aim of literature review was to support one's argument, it also summarized and synthesized the ideas that other researchers and scholars have already put forward.

The literature review also helped in finding out what methodologies and sampling procedures have been used before, giving insight into how it is possible to come up with a research strategy, and be able to justify its appropriateness for the specific research project. Case studies were identified for their research procedures and results value. The literature review also gave direction on the need to cite as well as direction in the proper referencing style in a discipline.

The view expressed in current literature sources points to the fact that librarians possess skills that are vital in KM and to the need for them to widen their skills set and think more so as to understand the changing information environment. There is no consensus as to the extent to which librarians can be viewed as KM practitioners, but it exists in relation to the importance of integrating KM practices into their work since they revolve around the totality of operations of the library.

CHAPTER THREE: RESEARCH METHODOLOGY

> *Do not hover always on the surface of things, nor take up suddenly, with mere appearances; but penetrate into the depth of matters, as far as your time and circumstances allow, especially in those things which relate to your profession.*
>
> Isaac Watts (1743)

3.0 Introduction

Understanding KM concepts and their place in library practice was an important feature of Chapter Two. In that chapter, it was established from literature that KM is applied to the private sector much more than to academic organizations, and even less to academic libraries. The literature review was intended as "a means to an end" (Yin, 1984: 20), the end being an understanding of KM in academic libraries. The examples quoted as making strides in the use of KM principles and tools originate mainly from big academic libraries which are well funded. All the same, the literature also shows that KM is a subject much talked about.

With that background, this chapter focuses on the mixed methods research methodology that was used to investigate whether KM practice was a feature at MCNY and specifically in the library. It examined library practice at MCNY in understanding the issues involved with implementing a KM framework in a library environment. So the study was intended to "penetrate into the depth of matters…especially those things that relate to (*my*) profession" (Watts, 1743), as indicated in the quotation above, using mixed methods research.

3.1 Justifying the research paradigm and methodology

Research is the process of undertaking or carrying out original investigation in all its forms: analysis, innovation, experiment, observation, intellectual enquiry, survey, scholarship, creativity, measurement, development, hypothesis, modelling and evaluating with a view to

generating new knowledge or novel comprehension (Bushaway, 2003: 161). It may be identified as applied or basic. According to Powell and Connaway (2004: 53):

> Basic research tends to be theoretical in nature and concerns itself primarily with theory construction, hypothesis testing, and producing new, generalizable knowledge. Applied research tends to be more pragmatic and emphasizes providing information that is immediately useable in the resolution of actual problems, which may or may not have application beyond the immediate study.

These authors suggest that the two approaches to research are not mutually exclusive, and may be viewed as existing in a continuum. The same opinion is expressed by Leedy and Ormrod (2005: 43) who see the line between basic and applied research as "blurry". Sharing similar views, Argyris (1993) suggests that the distinction between basic and applied research be reformulated by showing how the latter can contribute to the former. This study is a mix of both pure and applied research. While it sought to generate new knowledge on library practice as basic research does, it also intended to provide a practical solution, (as applied research is used for), to problems that the library was facing. The type of data used were both qualitative and quantitative.

3.2 Qualitative versus quantitative distinction

According to Leedy and Ormrod (2005: 94), qualitative research is "typically used to answer questions about the complex nature of phenomena, often with the purpose of describing and understanding the phenomena from the participants' point of view". They go on to describe quantitative research as "used to answer questions about relationships among measured variables with the purpose of explaining, predicting, and controlling phenomenon" (Leedy and Ormrod, 2005: 94). Newman and Benz (1998) are of the opinion that the dichotomy does not exist, but rather there is an interactive continuum between the two approaches. As a summary, Creswell and Plano Clark (2007: 29) provide a table that shows the similarities and differences between the two, "on a continuum" and that is illustrated in Table 4.

Table 4: Elements of qualitative and quantitative research in the research process

Elements of qualitative research tend toward…	Stage of research	Elements of quantitative research tend toward…
• To understand meaning that individuals give to a phenomenon inductively	**Intent of research**	• To test a theory deductively to support or refute it
• Has minor role • Justifies problem	**How literature is used**	• Has major role • Justifies problem • Identifies questions and hypotheses
• Ask open-ended questions • Understand the complexity of a single idea (phenomenon)	**How to focus on the intention of the investigation**	• Ask closed-ended questions • Test specific variables that form hypotheses or questions
• With the use of words and images • From participants at a few research sites • Study participants at their location	**How data are collected**	• With the use of numbers • From many participants at many research sites • Sending or administering instruments to participants
• Text or image analysis • Themes • Larger patterns or generalizations	**How data are analysed**	• Numerical statistical analysis • Rejecting hypotheses or determining effect sizes
• Identifies personal stance • Reports bias	**Role of the researcher**	• Remains in the background • Takes steps to remove bias
• Using validity procedures that rely on the participants, the researcher, or the reader	**How data are validated**	• Using validity procedures based on external standards, such as judges, past research, statistics

Creswell and Plano Clark (2007: 29)

Having a continuum means that the characteristics of each type of research go through a gradual transition from one to the other, without any abrupt changes. Johnson and Onwuegbuzie (2007:

123) refer to this as the "qualitative-quantitative continuum". Additionally, Creswell and Plano Clark (2007: 28), who agree with Leedy and Ormrod (2005), say that "no single study perfectly fits all of the elements of either a qualitative or quantitative study". Johnson and Onwuegbuzie (2004: 14) see it as a third research paradigm and assert that:

> if one prefers to think categorically, mixed methods research sits in a new third chair, with qualitative research sitting on the left side and quantitative research sitting on the right side.

Johnson, Onwuegbuzie and Turner (2007), besides reiterating the same point, also bring out the importance of a mixed methods approach being appropriate to use for answering one's research questions. This was the approach used for this study.

3.3 Research procedures

Traditional research designs/ procedures are based around experiments, surveys, or case studies. In all three instances - experiments, surveys, and case studies - the questions to be answered differ. The choice of any research design is influenced by "three conditions: the type of research question posed, the extent of control the investigator has over actual behavioral events and the focus on contemporary as opposed to historical events" (Yin, 2003: 1). Yin (2003) summarizes the choices of strategies or designs, accompanied by the relevant questions as shown in Table 5.

An experiment is where an experimental variable is manipulated, and alternative influences on the dependent variable are controlled (Powell and Connaway, 2004). According to Powell (1997), this is done to test a causal relationship. "Simply stated, causality suggests that a single event (the "cause") always leads to another single event (the "effect")" (Powell, 1997: 123). In the current study, the focus was not on causal relationships that are influenced by the manipulation of variables. Fidel (1984: 273) says that in a case study, "no basic laws exist to determine which factors and relationships are important, and when the factors and relationships can be observed directly". Rather, this was a detailed study on current library practice in a specific case, and how to remain relevant in a changing information environment, without manipulating any variables.

Table 5: Relevant situations for different research strategies

Strategy	**Form of research question**	**Requires control of behavioural events?**	**Focuses on contemporary events?**
Experiment	How, why	Yes	Yes
Survey	Who, what, where, how much/ many?	No	Yes
Archival analysis	Who, what, where, how much/ many?	No	Yes/ no
History	How, why	No	No
Case study	How, why	No	Yes

Source: Yin (2003: 5)

A survey is defined by Powell and Connaway (2004) as a research strategy that encompasses any measurement procedures that involve asking questions of respondents. Direct or indirect contact is made with the units of the study (for example, individuals, organizations, communities) by using systematic methods of measurement such as questionnaires and interviews. The questions that form the research agenda include "who, what, where, how much, how many" (Yin, 2003: 5). It is suitable for studying a large number of cases, even when they are geographically dispersed (Powell, 1997). The difference from a case study is that while a case study examines one or more case(s) in detail (Powell, 1997) and follows it through for some period of time, a survey can include several different individual things or people, not studied in as much detail or during as much time. Thus, for this research, a survey questionnaire was used in a case study as the method was perceived to be suitable to use.

This study was done in the context of a single case study, the MCNY library, both as a unit of analysis, and as a research method. While Creswell (2007: 73) and Tellis (1997a) see a case study as a research methodology, Stake (2005: 438) views it as "a choice of what is to be studied". Onwuegbuzie and Leech (2006) and Powell (1997) define it as a qualitative research method. VanWynsberghe and Khan (2007: 9) redefine the case study as:

> not a method, methodology, or research design… case study could be considered a transparadigmatic and transdisciplinary heuristic that involves the careful delineation of the phenomena for which evidence is being collected (event, concept, program, process, etc.)… case study is not exclusively about the case revealing itself as it is about the unit of analysis being discovered or constructed.

Grünbaum (2007: 79) gives the distinction between a case study as a "unit of analysis and the case", since many researchers leave it unclear. The case as a unit of study was described in section 1.7 of Chapter One, but the details of case study research method follow.

3.3.1 Case study research method

According to Merriam (1988: 9), a case study is "an examination of a specific phenomenon, such as a program, an event, a process, an institution, or a social group". In the current study, it was an examination of an academic library. Additionally, it is, as defined by Leedy and Ormrod (2005: 108):

> a type of qualitative research in which in-depth data are gathered relative to a single individual, program, or event, for the purpose of learning more about an unknown or poorly understood situation.

The approach is determined by four factors:

> the nature of the research questions; the amount of control the researcher has over the variables under investigation; the desired end product; and the identification of a bounded system as the focus of investigation (Merriam, 1988: 8).

It is also used for investigative purposes where a researcher is utilising more in-depth methods to answer exploratory questions and to provide interpretive outcomes (Leedy and Ormrod, 2005; Powell, 1997). As a result, it provides the potential for a richer, more in-depth understanding of the issue being studied (Powell and Connaway, 2004). A case study can be used for such purposes as testing theory, theory development, and organizational problem solving. This fulfils the important criteria which were applicable to the research in this study. Besides the fact that it can provide direction for further areas of investigation, Leedy and Ormrod (2005) suggest that the case research is also good for generating hypotheses.

The case study method was suitable for this research because the focus was unique and sought to understand the complexity of issues relating to implementing a KM framework in an academic library environment. According to Merriam (1988: 12), a case study "often builds upon tacit knowledge and provides a thick description of the case under investigation". The concept of KM at the MCNY library was in an exploratory stage at the time of this study. Benbasat, Goldstein and Mead (1987), Powell (1997), Powell and Connaway (2004), and Rowley (2002) echo the same view about a case study being suitable at the exploratory stage of knowledge building. O'Sullivan, Rassel and Berner (2008:42) agree that "the exploratory case study serves as the basis for establishing new research questions, new hypotheses, and a continuing research agenda". The same view is expressed by Leedy and Ormrod (2005: 135): "a case study may also be useful for investigating how an individual or program changes over time, perhaps as the result of certain circumstances or intervention".

Some major advocates of case research, Yin (2003; 1994; 1984) and Benbasat, Goldstein, and Mead (1987), argue that the case approach can contain some degree of validity as with more positivist approaches. It employs a number of different approaches concurrently to investigating and answering questions, with the intention of enhancing objectivity. Sharing the same view, O'Sullivan, Rassel and Berner (2008: 40) indicate that "one of the hallmarks of a case study is the combination of several different sources of information…". Merriam (1988: 8) also points to "the case study's unique ability to deal with a full variety of evidence, including documents, artefacts, interviews, and observations". O'Sullivan, Rassel and Berner (2008: 40) suggest that the sources of information used in a "case study include documents, archival information, interviews, direct observation, participant observation, and physical artifacts". The same conclusion is arrived at by Benbasat, Goldstein and Mead (1987), Creswell (2003), Creswell and Plano Clark (2007), Grünbaum, (2007), Leedy and Ormrod (2005), Rowley (2002), and Yin (1984).

Zuber-Skerritt and Fletcher (2007), in agreement with previous research by Rowley (2002) and Benbasat, Goldstein and Mead (1987), highlight the importance of the experiences of the subjects and the context within which they operate in a case study. To Leedy and Ormrod (2005: 135):

> the researcher also records details about the context surrounding the case, including information about the physical environment and any historical, economic, and social factors that have a bearing on the situation.

The significance of this detail is in the fact that the current study was done by measuring certain concepts, propositions, and characteristics of a library operating in a fast changing information environment, wanting to find out why it was that the way it operated worked, or did not work, without manipulating any factors, and the implications of any suggestion to operate in a KM framework.

This is similar to grounded theory research where context is very important. The difference from a case study is that in the former, "the perspectives and voices of the people being studied" (Leedy and Ormrod, 2005: 135) must be included. In reference to using the grounded theory, Gubrium and Holstein (2001: 137) mention that "the essences of life stories told seriously and consciously, in the voices of the persons telling them, are timeless…". A case study, on the other hand, can draw conclusions without necessarily including the actual voices. If a case study is used to study an under - researched area, and theory is subsequently created, that is not grounded research. It is not primarily about theory creation or generation - though any theories that may arise would enhance the information science profession. Grounded theory research "is a type of qualitative research aimed at deriving theory through the use of multiple stages of data collection and interpretation" (Leedy and Ormrod, 2005: 108). Meanwhile, case study research is aimed at understanding and finding solutions to the shortcomings in a situation.

The limited time scale for the research makes the case study approach appropriate since it allows for the investigation of a particular phenomenon to some depth in a short time. "Case studies are a form of inquiry that does not depend solely on ethnographic or participant - observer data" (Yin, 1994: 22). Use of the ethnographic study takes prolonged periods of time before completion. Indeed Merriam (1988: 27) asserts that "if the phenomenon …is not bounded, it is not a case", a characteristic that is also highlighted by VanWynsberghe and Khan (2007) in their emphasis on time and place boundaries of a case study. According to Leedy and Ormrod (2005: 135), "a particular individual, program, or event is studied in depth for a defined period of time". Thus, the study of KM practice in the MCNY library and its effectiveness (or absence of it) had

to be done within a specified period of time, not indefinitely. It was in this context that KM practices were investigated.

The case study approach answers to the questions of "why" and "how" (Benbasat, Goldstein and Mead, 1987; Kyburz-Graber, 2004; Rowley, 2002; Yin, 2003) in the subject of study. Thus, the relevance of the case study is more important than its ability to be generalized, because it deals primarily with a specific case. If the published results can subsequently be applied to answer the same questions in different circumstances, that enhances its validity. The characteristics of the case study correspond to the area under investigation: the perceptions of participants (MCNY employees) about KM practice in a specific context (MCNY library). Benbasat, Goldstein and Mead (1987) list eleven characteristics of case studies which are shown in Table 6 which demonstrate the suitability of the approach to this investigation.

Table 6: Key characteristics of case study and application to this research

Key characteristics of case studies	**Application to this research study**
1. Phenomenon is examined in a natural setting	Observation and interviews with staff in the MCNY college
2. Data are collected by multiple means	Data collected by interviews, questionnaires, documents and observation
3. One or few entities (person, group or organization) are examined	Research concerned itself with the perceptions held by staff and faculty at MCNY
4. The complexity of the unit is studied intensively	The focus was on library service and KM practice
5. Case studies more suitable for exploration, classification and hypothesis development stages of the knowledge building process	No definitive hypothesis was tested because the approach was more exploratory. Outcomes can be used as a building process for further research to be conducted
6. No experimental controls or manipulation are involved	No experimental controls or manipulations were involved
7. The investigator may not specify the set of independent and dependent variables in advance	Independent or dependent variables were not identified in advance
8. The results derived depend heavily on the integrative powers of the investigator	The results from the study were drawn from the questionnaire, observations, documents, and interviews. Great care was taken in the construction and planning of interviews and observation techniques, and the questionnaire with regard to reliability and validity
9. Changes in site selection and data collection methods could take place as the investigator develops new hypotheses	Site selection and appropriateness of the environment did not change during the planning stages as the aim of study was clarified and expanded
10. Case research is useful in the study of "why?" and "how?" questions because these deal with operational links	The type of data collected was "how?" and "why?" questions
11. The focus is on contemporary events	The use of KM practices is a contemporary and current concern, and expected to grow rapidly

Adapted from Benbasat, Goldstein and Mead (1987: 371)

In other words, a case study is a type of field study (Fidel, 1984; Grünbaum, 2007) characterized by several research procedures. These include the identification of a case entity as a single individual, organization, issue, activity, event in its real life context, or program of interest that is bounded by certain time and space delimitations; an intensive description and analysis of the case entity reflecting its context and multiple data sources; and the ability to acquire more insight on the uniqueness of a particular case, or to refine a theoretical explanation of an issue or event, and where there are multiple cases, to gain insight on the phenomenon represented across the several cases (Yin, 1984).

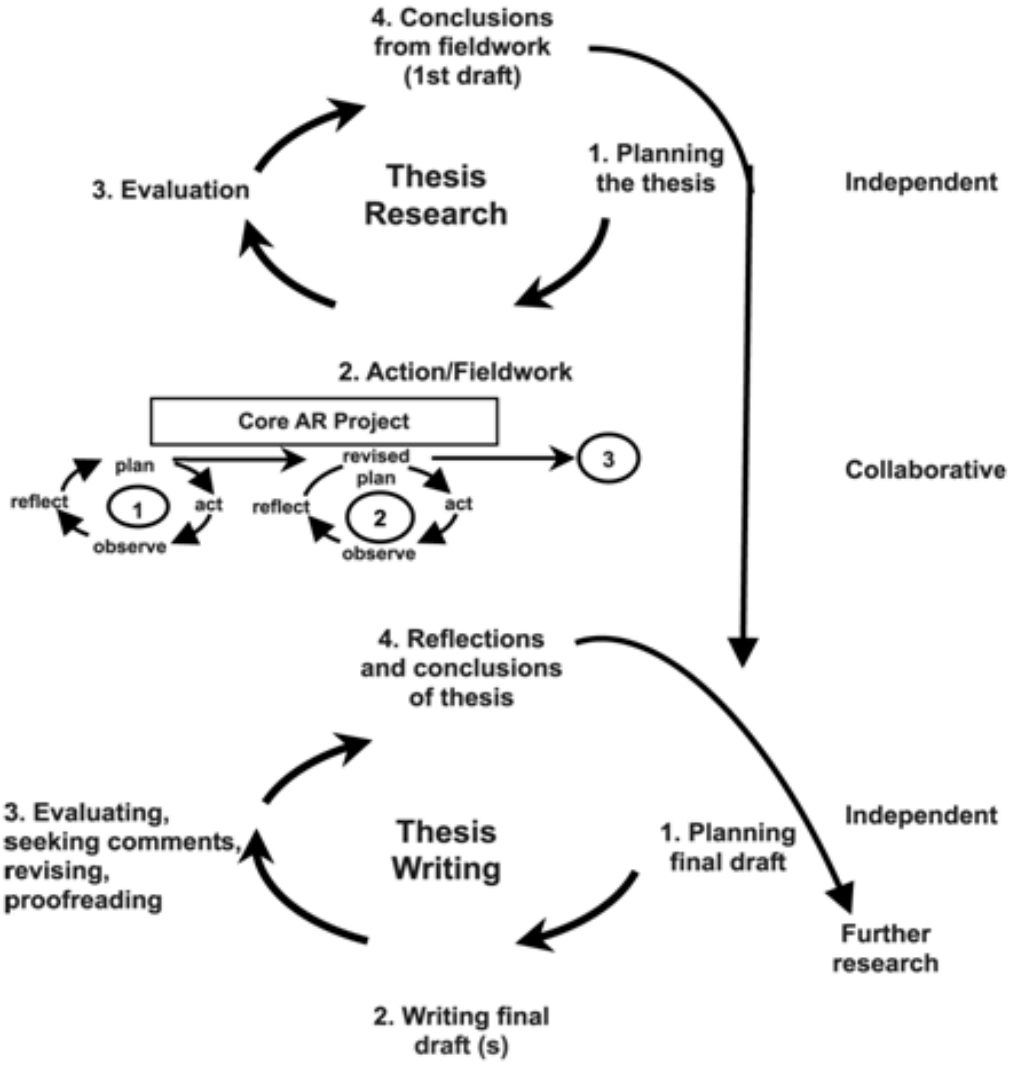
This case study was in an action research context. According to Gray (2004), the main research medium for action research is the case study. In addition to doing research in an action research context, the researcher was a participant, and stood to benefit from the possible realization of prescriptive solutions which were interventionist. The question to focus on in action research is "how to". Argyris (1998) views action research as a process of problem diagnosis, action intervention, and reflective learning. However, the demarcation is sometimes not clear cut, especially when research is done in one's place of work and issues concerning observation without participating are involved, as in this case. The knowledge that this was a continuing research agenda and using a case study to understand KM concepts in an action research process was to enable or pave the way for interventions even after the completion of this particular research. This is why Figure 4 ends with an arrow pointing towards "further research".

3.3.2 Action research process

Action research, according to a description by Leedy and Ormrod (2005: 108), is "a type of applied research that focuses on finding a solution to a local problem in a local setting". By applied research, they mean a "project which can inform human decision making about practical problems" (Leedy and Ormrod 2005: 43). It was important to examine library service as it was offered at the time of the study, and determine the elements that involved KM in the investigation, in an effort to investigate the chances of an enhanced value service. Action research design was perceived as best suited for this

type of investigation where the researcher worked in the place of research, aimed at improving or changing and understanding work processes (McClure, 1989; Zuber-Skerritt and Fletcher, 2007). According to Gray (2004: 26), "action research involves close collaboration between researcher and practitioners and places an emphasis on promoting change in an organization". Zuber-Skerritt and Perry (2002) have done some studies on the concept of action research and come up with the model that is represented in Figure 4.

Figure 4: **Conceptual model of an action research thesis**



Source: Zuber-Skerritt and Perry (2002: 177)

It shows that the study is a part of a process that goes in cycles, with the aim of continuously reviewing and improving, because in this case the research was intended to improve the way the library operated. It sought to understand the KM process as a possible method of improving library service value and quality. Action research is also intended for the development of new knowledge and understanding of certain phenomena, which was the intention of this study. Additionally, one of the goals of action research is to bridge the gap between theory and practice within an organization (Argyris, 1993; McClure, 1989).

Knowledge gained from doing this KM case study can be used to plan for future directions in the way the library operates, and at the same time increase the visibility of the library's place in the College. According to Checkland and Holwell (1998: 17), "…ending a piece of research is ultimately an arbitrary act. The flux of events and ideas which constitute the research situation will continue to evolve through time". In reference to the cycles of action research, Zuber-Skerritt and Perry (2002: 176) point out that:

> although these two or three cycles do not have to involve the same workgroup, the understanding gained by one workgroup in the reflection phase of the first cycle should be transferred to the next workgroup for their planning phase, that is, for the second cycle in the spiral.

While Benbasat, Goldstein and Mead (1987) position action research as a subset of case study research, Gray (2004) views case study research as a medium by which action research can be pursued. The delineation between the action cycle and the research cycle in action research, as explained by Blichfeldt and Anderson (2006), helped in this study because the emphasis was more on the research cycle than on the action one. The intention was to have a gradual synthesis of research results from the case study, and planned action which may come to fruition even after the current exercise. In two case studies done in the higher education field in Ireland, Tormey *et al*., (2008) confirm the validity of case studies as valuable in the action research process. This study therefore contends that the differences between the two make them complimentary and compatible.

The differences between action research and case studies are highlighted below in Table 7.

Table 7: Differences between case studies and action research

Case Studies	**Action Research**
Researcher is an observer	Researcher is an active participant
Exploratory, explanatory or descriptive	Prescriptive, intervening
Focus on "How?" and "Why?"	Additional focus on "How to?"
May be positivist or interpretivist	Usually interpretivist

Adapted from: Blichfeldt and Andersen (2006)

The fact that action research is not explorative makes the case study approach relevant as it, in turn, answers exploratory issues. Thus, findings from studying and discussing KM theory, library theory and library practice as relevant to the modern library and information environment can be put into practice as a result of this study.

3.3.3 Validity and reliability in a case study

The extent to which research findings are believable or credible is its validity. In other words, the validity of a study refers to the strength of the inferences or conclusions that are made from the research, that is, the degree of accuracy to which a study reflects the concept(s) that the research is measuring. Leedy and Ormrod (2005: 97) ask two questions:

> Does the study have sufficient controls to ensure that the conclusions we have drawn are truly warranted by the data? …can we use what we have observed in the research situation to make generalizations about the world beyond that specific situation?

According to Ngulube (2005: 132), the question to consider is: "has the research measured the phenomenon of interest in a manner that accurately reflects its characteristics?".

Researchers classify validity as internal or external (Yin, 1994; 2003). In the design of a study, the care taken to conduct measurements and decisions concerning what was and was not measured is its internal validity. Internal validity becomes especially relevant at the data analysis phase in a case study because that is where explanations and rival explanations are examined. The reason is that it determines the degree to which conclusions about causes of relations are likely to be true, in view of the operational measures used, the research setting, and the whole research design. According to Rowley (2002: 20) internal validity is relevant for "explanatory or causal studies only, and not for descriptive or exploratory studies". She proposes that it refers to the process of "establishing a causal relationship whereby certain conditions are shown to lead to other conditions, as distinguished from spurious relationships" (Rowley, 2002: 20).

The correct operational measure for the concepts being studied is the construct validity (Yin, 1984), and that is a type of internal validity. Rowley (2002: 20) suggests that construct validity refers to "linking data collection questions and measures to research questions and propositions". While doing the research, the researcher has to be sure that the research instrument (s) in use is functioning as intended. In other words, the extent to which the research instrument measures the propositions in question, also known as construct validity, has to be clear. Hernon and Schwartz (2009a: 73) point out that construct validity refers to the stage where an "instrument measures what it is intended (the construct)". Yin (2003: 34) proposed three remedies to establish this: using multiple sources of evidence, establishing a chain of evidence, and having a draft case study report reviewed by key informants. In a case study, construct validity is particularly important at the data collection phase.

Another type of validity is external validity, that is, the possibility of applying the findings to other settings. It is the extent to which inferences about causal relationships can be made or generalized (Yin, 1984). In other words, it is the interaction of causal relationships. Its importance is due to the fact that the same study should produce the same results if re-done, or if another individual uses the same method, even in a different college. Analytically generalizing the results needs to be possible (Rowley, 2002; Tellis,

1997a; Yin, 2003; 1994). An appropriate research design results in viable external validity of a study. According to Yin (2003) the use of theory in a case study is a useful tactic for achieving external validity.

Tellis (1997a: 3) points out that criticism directed at external validity is towards the statistical and not the analytical generalization. Analytical generalization, which is the making of inferences from a particular set of results to some broader theory (Yin, 1994), is the basis of case studies. Hernon and Schwartz (2009a: 73) refer to criterion validity whose purpose is "to determine the extent to which the instrument treats a criterion". They also include content validity as an important attribute of a research design. By this they mean "how well the content of the instrument represents the universe of content that might be measured" (Hernon and Schwartz, 2009a: 73). Yin (2003: 34) tabulates the case study tactics, matching them with the phase of research each is relevant to, in order to highlight the different types of validity that are essential in Table 8.

Table 8: Case study tactics

Tests	**Case study tactic**	**Phase of research in which tactic occurs**
Construct validity	• Use multiple sources if information • Establish chain of evidence • Have key informants review draft case study report	Data collection Data collection Composition
Internal validity	• Do pattern matching • Do explanation building • Address rival explanations • Use logic model	Data analysis Data analysis Data analysis Data analysis
External validity	• Use theory in single case study • Use replication logic in multiple case studies	Research design Research design
Reliability	• Use case study protocol • Develop case study database	Data collection Data collection

Yin (2003: 34)

When the research procedure consistently gives the same results on repeated trials, it means it is reliable. In other words, the repeatability of the measurement is what determines its reliability. According to Yin (1984), when the operations of a study can be repeated, such as the data collection procedures, producing the same result, that shows that it is reliable. Tellis (1997a) discusses the importance of reliability which, in a case study, is achieved through the development of the "case study protocol". As ways to estimate reliability, Hernon and Schwartz (2009) suggest internal consistency (a measure of the precision of the measuring instrument), pre-test (the use of individuals who are not part of the actual sample to test questions to ensure that their meanings are understood), test and retest (whether similar results are obtained when the same participants respond to the same test a second time).

One of the tactics, mentioned in Table 8, and in the case study protocol in Appendix A, is the logic model. In a logic model, the current work situation that is the target of change is analysed, expected outputs or results are projected, the functions of the individuals involved in the process are examined, and the intended goal of the exercise is clarified. It can be used as a planning tool that allows precise communication with all involved about the purposes of the effort, and the sequence of activities and accomplishments. In essence, this is what this KM case study in an action research context looks like. The results from the case study are a part of the action research cycle. This helps verify the validity of the research findings and in the process minimize the problem that "there appears to be general agreement that there is a crisis of representation in qualitative research" (Onwuegbuzie and Leech, 2007: 298).

3.3.4 Validity and reliability in action research

When considering validity in quantitative terms in action research, it is a test of whether the data we collect accurately helps us achieve what we are trying to measure. In other words, the data should be able to withstand the scrutiny of other researchers (Checkland and Holwell, 1998). In qualitative terms, validity refers more to the trustworthiness of the research. Given the fact that action research gains knowledge that is in the context of a

specific environment, validity and reliability depend on whether the discoveries made from the research and the planned intervention solve the problem identified (Checkland and Holwell, 1998; Watkins, 1991), and also through the triangulation of data (Singh, 2006).

Writing accurately also enhances the validity of the study. In addition, the relevance of the research findings to the researcher and/or the audience the research is intended for is what is most important in action research, rather than the capacity to generalize the results. This characteristic has also been noted by Tellis (1997a) and Yin (1984; 1994; 2003) as important in case study research. Reliability of the research is also dependent on the validity of the research instrument used (Ngulube, 2005). In this study, the research instruments used included a questionnaire, an observation protocol, and an interview protocol.

3.4 Justification for mixed methods research methodology

Use of institutional records alone, or the MCNY archive alone, gives only bits of information, but not the whole story of the College library. When "one approach to address the research problem would be deficient" (Creswell and Plano Clark 2007:33), such as the case that was being investigated, or "when more detailed views of select participants can help to explain the quantitative results" (Creswell and Plano Clark, 2007: 34) or "when qualitative research can provide an adequate exploration of a problem, but such an exploration is not enough" (Creswell and Plano Clark, 2007: 34), then the use of mixed methods research becomes appropriate.

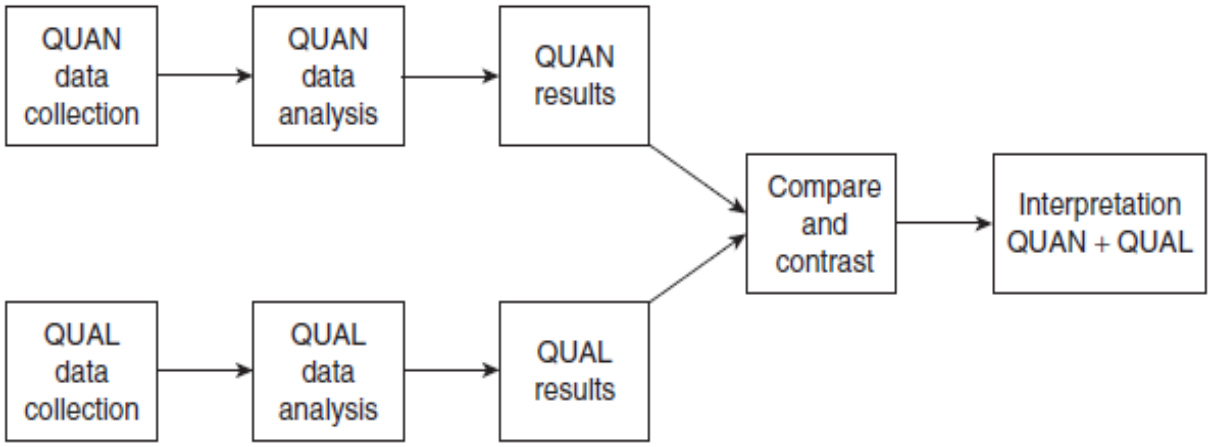
A mix of both qualitative and quantitative research methodologies was used in understanding the case of MCNY and its library's practice in a changing information environment. Data that were collected quantitatively were analysed quantitatively, resulting in quantitative results. The same was done with the qualitative dimension of it. The result was a comparison and contrasting of the qualitative and the quantitative

outcomes, and ultimately an interpretation of all the results. This type of parallel relationship in qualitative and quantitative methodologies is illustrated in Figure 5.

A parallel relationship is defined by Onwuegbuzie and Collins (2007: 292) as denoting that "the samples for the qualitative and quantitative components are different but are drawn from the same underlying population". This means that those who received questionnaires were not necessarily the same individuals interviewed. Fidel (2008: 265) points out that:

> the motivation to mix methods in research is the belief that the quality of a study can be improved when the biases, limitations, and weaknesses of a method following one approach are counterbalanced, or compensated for , by mixing with a method belonging to another approach.

Figure 5: Triangulation design model for converging quantitative data and qualitative data in mixed methods design



Legend: QUANT= quantitative
QUAL = qualitative

Source: Creswell and Plano Clark (2007: 63, Figure 4.1b)

In using the mixed methods research methodology, it is important to keep in mind discussions that have taken place concerning at what stage the mixing happens. Fidel (2008: 266) mentions:

> methods triangulation: checking the consistency of findings generated by different data collection methods; triangulation sources: checking the consistency of different data sources within the same method; analyst triangulation: using multiple analysts to review findings; theory/ perspective triangulation: using multiple perspectives or theories to interpret data.

Creswell and Plano Clark (2007), and Denzin (1978) also refer to the same concepts in writing about data triangulation, or theory triangulation or methodological triangulation as varying approaches to triangulation. However, Fidel (2008: 265) comments that:

> while scholars often agreed that an MMR project included a mixture of both quantitative and qualitative components, they disagreed on how these components should relate to one another and what level of integration was required.

Despite the discussions, the use of a mixed methods methodology in this study was based on the fact that firstly, it allowed for the collection of different types of data concurrently and sequentially. Secondly, it was possible to write conclusions of results from both qualitative and quantitative methods in a manner that enabled flexibility and clarity. However, research into the use of mixed methods research methods in library science revealed that "the approach has not yet established itself as a concept in LIS research" (Fidel, 2008: 271).

Fidel (2008) raised concerns about the fact that scholars who use qualitative and quantitative research have different interpretations of concepts like validity, or sampling. Another concern is about the order of combination of the qualitative and quantitative elements. The next concern is the fact that with a single researcher there tends to be bias towards one or the other method because not many researchers are equally comfortable with both methods. There is also a concern about "what standards should be used to judge the quality and credibility of a MMR project?" (Fidel, 2008: 267). All the concerns are valid but did not disqualify it as a suitable approach to utilize. They only made it more

challenging to discover how best to make the approach more meaningful. In the view of Johnson, Onwuegbuzie and Turner (2007: 129), mixed methods research:

> recognizes the importance of traditional quantitative and qualitative research but also offers a powerful third paradigm choice that often will provide the most informative, complete, balanced, and useful research results

3.4.1 Validity in mixed methods research methodology

In the practice of mixed methods research, "data collection also involves both numeric information (for example, on instruments) as well as text information (for example, on interviews) so that the final database represents both qualitative and quantitative information" (Creswell, 2003: 20). According to Gray (2004: 26), in mixed methods research:

> while emphasis is on seeking information on the attitudes and perspectives in the field, the way in which data are collected may involve both quantitative and qualitative methods.

Creswell and Plano Clark (2007), Zuber-Skerritt and Fletcher (2007) and Rowley (2002) discuss the applicability of the mixed methods approach. "It generally involves the concurrent, but separate, collection and analysis of quantitative and qualitative data so that the researcher may best understand the research problem" (Creswell and Plano Clark, 2007: 64). Corroboration of results from the different methods validates the approach, and makes the results complementary to each other.

It appears that there is no clearly defined way of assessing validity in mixed methods research. Onwuegbuzie and Johnson (2006) are not convinced about using the terms "validity" as used by quantitative researchers, or "trustworthiness, credibility, plausibility, and dependability" as used by qualitative researchers. According to them, legitimation is a better term for a different research procedure – mixed methods research. Instead of validity, Tashakkori and Teddlie (2008: 27) coin a term "inference quality" to mean mixed research validity. Inference quality refers to design quality and interpretive

rigour of the research. They see this as the extent to which a study adheres to best practice, and interpretive rigour. Onwuegbuzie and Johnson (2006: 55) suggest that:

> design quality refers to the standards used for the evaluation of the methodological rigor of the mixed research study, whereas interpretive rigor pertains to the standards for evaluating the validity of conclusions.

Instead of generalizability of findings, Tashakkori and Teddlie (2008: 28) use inference transferability to mean "the degree to which the conclusion from an MM study may be applied to other settings…" According to Dellinger and Leech (2007: 315), "the concept of validity has yet to be delineated for mixed methods research". The suggestions by Tashakkori and Teddlie (2008), and Johnson and Onwuegbuzie (2004) seem to be variations in the naming of concepts. However, the enhancement of validity, in addition to the careful weighing of the evidence obtained, is determined by the appropriateness, thoroughness and effectiveness that a research method used.

3.5 Sampling procedures

Sampling procedures involve the definition of the sampling techniques, the population, the instrumentation, and the procedures used to obtain the data (Powell and Connaway, 2004). According to Kumar (1999), and Leedy and Ormrod (2005), sampling is done to create a small group from a population that is as similar to the larger population as possible. It should be a little group that is like the big group, so the degree of resemblance and representativeness is very important (Teddlie and Yu, 2007). According to Ngulube (2005: 132), "by studying the sample it is possible to draw valid conclusions about the larger group".

The technique used in this study for quantitative data collection was random sampling. It gave equal chances to everyone in the population to be selected as part of the sample that was ultimately used. On the other hand, purposive sampling was used for qualitative data collection. This was a sample based on the researcher's knowledge of the population and objectives of the research, as suggested by Powell (1997).

When sampling, it is important to keep in mind the fact that errors can arise on account of the sampling process, or the measurement using the sample, or even non-sampling. On the other hand is the problem of precision, that is, the range within which the population parameter will lie in accordance with the reliability specified in the confidence level (Powell and Connaway, 2004). The confidence level tells one the "level of certainty that the characteristics of the sample represented the target population" (Ngulube, 2005: 135). In other words, sample size is determined by how large of a sampling error an investigator is willing to accept, and the variability within the population from which the sample is drawn (O'Sullivan, Rassel and Berner, 2008). This is affected by the percentage of the population that the sample represents. In this study, the use of both purposive sampling and random sampling enabled the generalizing of findings back to the population especially after the corroboration of findings.

Although Collins, Onwuegbuzie and Jiao (2006) point out that literature does not seem to reveal any specifically appropriate sampling designs for mixed-methods research, they suggest that "in mixed methods investigations, researchers must make sampling decisions for both the qualitative and quantitative elements of the study" (Collins, Onwuegbuzie and Jiao, 2006: 85). Teddlie and Yu (2007: 77) suggest that "probability sampling techniques are primarily used in quantitatively oriented studies…". On the other hand:

> purposive sampling techniques are primarily used in qualitative (QUAL) studies and may be defined as selecting units (e.g. individuals, groups of individuals, institutions) based on specific purposes associated with answering a research study's questions (Teddlie and Yu, 2007: 77).

Non-probability sampling techniques include purposive sampling which, according to Kumar (2005: 179), is determined by "the judgement of the researcher as to who can provide the best information to achieve the objectives of the study". This definition is corroborated by Leedy and Ormrod (2005; 2010) as well as by O'Sullivan, Rassel and Berner (2008) who all express the view that this method depends on the researcher's judgement of who to include in a sample. Mixed methods sampling therefore includes the

use of elements from both probability and non-probability sampling techniques. In fact, Teddlie and Yu (2007: 84) suggest that:

> the dichotomy between probability and purposive becomes a continuum when MM sampling is added as a third type of sampling technique…with purposive sampling on one end, MM sampling strategies in the middle, and probability sampling techniques on the other end.

Given the scenario that the research used both qualitative and quantitative data, the question to consider was whether the sample(s) used to collect qualitative data would be the same one used to collect quantitative data. According to Creswell and Plano Clark (2007: 119), there is no consensus about this, but:

> a common practice among mixed methods researchers is to select the same individuals for both the quantitative and qualitative data collection, so the data can be more easily converged or compared.

The approach that uses the already selected random sample to get the purposive sample data was adopted in this study.

3.5.1 Population

The population of this research was the same as the sample frame, and that was the MCNY employee community that included administrators, non-administrative staff, full-time and part-time faculty and librarians. It was the total group of people about whom conclusions were drawn. Selecting a group of people, from the larger population for measurement required that this group be representative of the population to ensure that the findings can be generalized to the population as a whole (Ngulube, 2005). It therefore required a proper definition of the sample.

3.5.1.1 Sample selection

From the sample frame, (the listing of the accessible population from which the sample was drawn), the qualitative and the quantitative samples were extracted. To determine

who actually participated in the quantitative study, a frame originating from the list of personnel in the MCNY Microsoft Access database was available. Following the suggestion of Powell and Connaway (2004: 100) that "in selecting a stratified random sample, one must first divide all of the population elements into groups or categories and then draw independent random samples", selection of participants was from each of the different categories of MCNY employees. Using those categories, the names of everyone who was in the database were copied and pasted onto a Microsoft Excel spreadsheet. In the column next to where each name appeared, it was necessary to insert the function =rand(), which is Excel's method of putting a random number between 0 and 1 in the cells.

Selecting both the list of names and the random numbers and clicking the SORT command in the DATA tab resulted in the re-arrangement of the list to a random order from the lowest to the highest number. This decision was based on the fact that after allowing a random allocation of numbers to people's names, the chances of any of the individuals being included in the study were as good for any one name as for the next name (Leedy and Ormrod, 2005). This process enabled the researcher "to select elements in the population which would be considered representative" (Slater, 1990: 40).

3.5.1.2 Sample size

The size of the sample used in the study was dependent on the total number of people that should be represented by the data collected. Onwuegbuzie and Collins (2007) suggest that the sample size should be informed by the research objective, research question, and research design. According to Kumar (1999; 2005), the sample size is determined by three factors: the level of confidence the researcher wants to test the results; the degree of accuracy the researcher requires to estimate the population parameters; and the estimated level of variation with respect to the main variable being studied. Creswell and Plano Clark (2007: 113) suggest that:

> If the quantitative research design is an experiment, investigators turn to power analysis formulas; if the study is a survey, sampling error formulas can help identify the appropriate size for the sample.

In this study, the use of a questionnaire required survey type sample size calculation, meaning that a sample error formula was used, rather than power analysis formulae.

Usually social science researchers assume that if the population is large, the sample also has to be large, but that is not necessarily accurate (Ngulube, 2005; O'Sullivan, Rassel and Berner, 2008). While researchers such as Ormrod and Leedy (2005) propose a sample size of 50% of the population, Grinnell (1997) suggests 10%. Thus, perspectives on the exact sample size vary. O'Sullivan, Rassel and Berner (2008: 155) point out that:

> one misconception about sample size is that a sample must include some minimum proportion of the population. This implies that if the size of the population is larger, the sample size must be increased by a corresponding amount. This is not the case.

In fact the main factors that determine the sample size are the desired degree of accuracy and the confidence level. Accordingly:

> A common rule of thumb is a 95% confidence level so that the results are accurate to within ±3%. A sampling error of 3% and a 95% confidence level means that we can be 95% confident that the population would resemble the sample, ±3% sampling error (Ngulube, 2005: 135).

However, when there is a defined sample size, to increase accuracy without increasing the sample size, one has to settle for a lower confidence level; conversely, to increase confidence level and keep the same sample size, some accuracy must be sacrificed (O'Sullivan, Rassel and Berner, 2008).

The use of multiple methods research and triangulation was intended to enhance accuracy. In determining the sample size, confidence level was the priority, rather than the sampling error/ alpha level. It is the suggestion of Bartlett, Kotrlik and Higgins (2001) that in most research, 5% sampling error is acceptable. But then:

> an alpha level of .10 or lower is acceptable if the researcher is more interested in identifying marginal relationships, differences or other statistical phenomena as precursor to further studies (Bartlett, Kotrlik and Higgins, 2001: 45).

The decision in selecting the random sample for quantitative data collection was therefore to have a confidence level of 95% and a 10% (.10) sampling error, because the statistical phenomena that came out of the research were not an end in themselves, but a part of results to be compared with those from other data collection methods. The result was a sample of 79 individuals calculated with the use of the Sample Size Calculator.

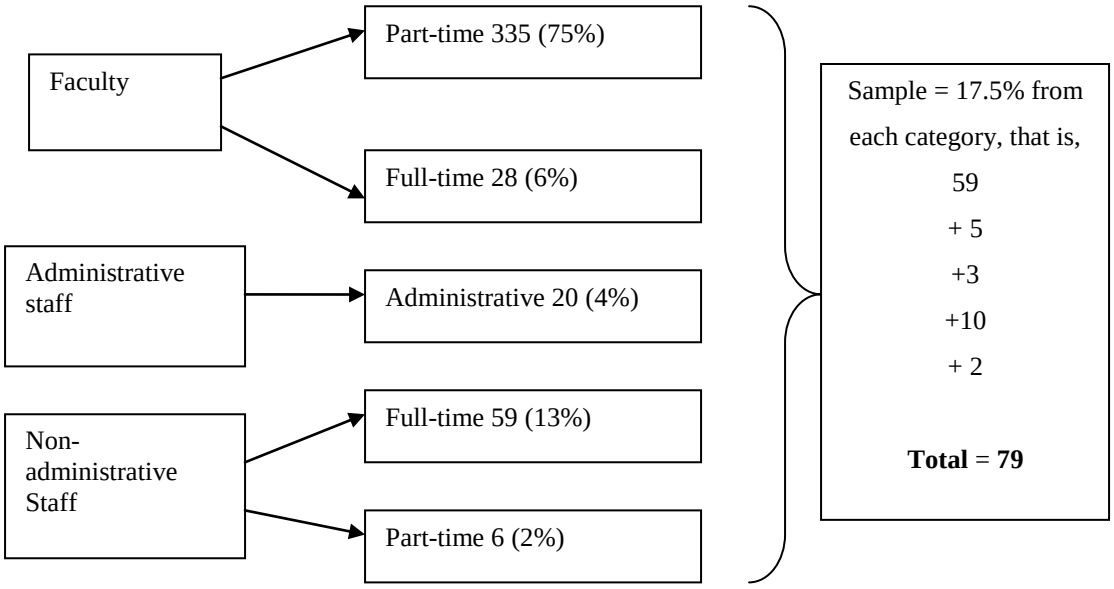
The specific type of probability sampling method used in selecting questionnaire participants was stratified random sampling, and that meant having representative sample proportions that would reflect the employee categories in the MCNY community. The reason for using this type was that there was a much larger group of part-time faculty than full-time, thus concurring with the suggestion put across by Onwuegbuzie, Jiao and Bostick (2004: 107) that this type of sampling "is to select a sample in such a way that identified subgroups on the population are represented in the same proportion that they exist in the population".

The 79 individuals constituted 17.5% of the total employee population of MCNY. To have representative samples to understand the characteristics and responses from the different groups, the same percentage was used to apply to all population groups in the sample frame. This means that with 17.5% of 335 part-time faculty members, 17.5% of 28 full-time faculty members, 17.5% of 20 administrative staff, 17.5% of 59 non-administrative full-time staff, and 17.5% of 6 non-administrative part-time staff, the 17.5% representation of 79 is arrived at as illustrated in Figure 6. It is supported by the suggestion of Ngulube (2005: 134): "nowadays, one does not have to be a statistician with some knowledge of sampling theory to estimate sample sizes for survey populations". This statement is based on the availability of computer software packages that facilitate this, for example, the above quoted Sample Size Calculator, or those listed on http://statpages.org/javasta2.html compiled by Pezzullo (2010) or on

http://www.freestatistics.info/stat.php compiled by Corsini (2010) that include SPSS, ANOVA, WinDAMS, and many more.

While "statistical representativeness is not an important consideration in qualitative research, especially when the researcher chooses to research the setting she or he is in" (Ngulube, 2005: 130), it is an important element in quantitative research because of "the standardized nature of the quantitative process and the visibility of the procedures used…" (Ngulube, 2005: 132).

Figure 6: Stratified random sample size calculation



To collect qualitative data from interviews, purposive sampling was used. The literature reviewed varied when it came to defining a particular size of sample for use in purposive sampling. Tashakkori and Teddlie (2008) suggest anything between 6 - 24 for case studies, and 6 – 8 participants per group in focus groups. Onwuegbuzie and Collins (2007) suggest 3-5 participants for case studies, 12 participants for interviewing, and a range of 6 – 12 (quoting from different sources) for focus groups. In this study, the researcher contends that 5 participants as interview candidates can give insightful information. These were selected from the already delineated sample and perceived by

the researcher to be key individuals who would give invaluable insight and more detailed answers to the research questions.

In this research, the biggest group was the part-time faculty members, followed by full time faculty and full-time staff. The employees included administrative and non-administrative categories. The differences in the size of samples used in collecting qualitative and quantitative data for the mixed methods research were based on the suggestion made by Creswell and Plano Clark (2007: 119) that " the size of the quantitative sample (preferably randomly selected) will not be the same size as the smaller (preferably purposefully selected) qualitative sample".

3.6 Sources of evidence

Data collection techniques determine the success of an investigation. Powell (1997: 49) suggests the use of "questionnaires, interviews, observation and the analysis of documents" for data collection for a case study. Benbasat, Goldstein and Mead (1987), Creswell (2003), Creswell and Plano Clark (2007), O'Sullivan, Rassel and Berner (2008), Rowley (2002), Yin (1984) and Merriam (1988) list the same sources too.

Evidence was obtained from using both the quantitative and the qualitative component. The quantitative data were collected with the use of a web-based online questionnaire, and structured observation, while the qualitative results were from the use of institutional documents, and structured open-ended interviews. In addition, e-mail requests directed to the reference librarian and database usage patterns were observed for an insight into what the problems library users faced were. In other words, the sources of data were:

(i) Librarians for their personal knowledge, organizational procedures, (for example, training, collections, Internet, databases, library profiles, the College's profile), and personal advice from colleagues, academics, and experts;
(ii) Library Users (staff, academics) also for their personal knowledge, organizational procedures, and perceptions on the quality of library service because these gave

an indication of the viability of a KM approach. This was similar to the KM study by Hayes (2007) at the University of Edinburgh library that included administrative and non-administrative employees, including librarians, in the study; and

(iii)Task Artefacts, that is, face-to-face communication, e-mail, website, reference desk, College infrastructures (for example, e-mail, fax, telephone). Obtaining data from documents, archival records, interviews, direct observation, participant-observation, physical artefacts echoes case study research findings of both Yin (1994; 2003) and Stake (1995).

3.6.1 Questionnaires

In a content analysis of librarianship research, Koufogiannakis, Slater and Crumley (2004) found that questionnaires/ surveys are one of the most commonly used methods of data gathering in library studies. Studies that have been quoted in Chapter Two, such as the KM related case studies of Ajiferuke (2003), Hamid and Nayan (2007), Jain (2007), Maponya (2004), White (2004), used questionnaires, interviews and observations to collect data.

Questionnaires and surveys are sometimes perceived to mean the same. According to Powell and Connaway (2004: 83), a "survey is a group of research methods commonly used to determine the present status of a given phenomenon". On the other hand, a questionnaire is a data collection tool (Powell and Connaway, 2004). In other words, while a survey closely considers something in a general or very broad way, or is a statistical study of a sample population by asking questions about age, income, opinions, and other aspects of people's lives, a questionnaire is a set of questions used to gather information in a survey. In this study, there was use of a questionnaire.

Leedy and Ormrod (2005:191) summarize the guidelines for questionnaire construction as:

> Keep it short; use simple, clear, unambiguous language; check for unwarranted assumptions implicit in your questions; word your questions in ways that do not give clues about preferred or more desirable results; check for consistency; determine in advance how you will code the responses; keep the respondents' task simple; provide clear instruction; give a rationale for any items whose purpose may be unclear; make the questionnaire attractive and professional looking; conduct a pilot test; scrutinize the almost-final product carefully to make sure it addresses your needs.

There are advantages and disadvantages to using questionnaires. These questionnaires may be online or postal. Fowler (2002), Hewitt (1991), Powell (1997), Powell and Connaway (2004), and Slater (1990) document advantages and disadvantages of questionnaire use. Powell and Connaway (2004) suggest that the administration of online questionnaires facilitates the gathering of data. The reason is that data would be relatively easy to collect and analyse in a short space of time. Fowler (2002), Powell (1997), and Powell and Connaway (2004) mention that this type of questionnaire is inexpensive to administer. Powell (1997) suggests that the fixed format of the questionnaire eliminates variation in the questioning process, even when respondents may interpret the same questions differently.

Powell and Connaway (2004) also mention such disadvantages as the absence of explanations to ambiguous questions, as well as a certain degree of non-responsiveness of respondents. Slater (1990) is concerned with questionnaire design as a possible hindrance to questionnaire effectiveness. This would be due to complicated questions, or questions that are excessively long. Hewitt (1991: 167) says that sometimes "some are so poorly conceived and executed that participation not only wastes the time of the respondent, but contributes to the production of inaccurate and misleading research".

To enhance the response rate of questionnaires, the Total Design Method (TDM) (Dillman, 1978) was consulted. In this method, questions are simple and clear, the questionnaire is pre-tested to make sure questions are well understood by the

respondents; the layout is clear, including use of a font that is easy to read; easy and interesting questions are at the beginning; questions build upon each other; there is a cover letter and a stamped response envelope accompanying the questionnaire. A higher response rate enhances the reliability and validity of the results. Creswell (1994) and Fowler (2002) also highlight that response bias caused by low response rates is an issue that a researcher needs to be on the lookout for.

3.6.1.1 Questionnaire structure

The order of the questions can have an impact on the accuracy of responses. Slater (1990) and Powell and Connaway (2004) suggest that questionnaires should start with more general questions which have the effect of putting the respondent at ease, followed by the more specific ones. The format of the questions used is determined by the information desired (Powell, 1997). These can be open-ended or closed ended (Powell, 1997; Powell and Connaway, 2004; Slater, 1990).

There was use of a closed-ended questionnaire (see Appendix F) where respondents were selecting responses from a list of choices. However, for determining which questions were useful and appropriate, there was a need to use an open-ended questionnaire (see Appendix E) first. O'Sullivan, Rassel and Berner (2008: 222) suggest that "open-ended questions are important in the first stages of questionnaire design". Data were also gathered by using open-ended interviews. This allowed for an understanding of where questions were vague, irrelevant, useless, inappropriate, and unclear, before a final research instrument was created. Powell (1997) views the information needs and the characteristics of participants as essential to the effectiveness of a questionnaire. This determines whether the questions seek to get data about facts, or opinions and attitudes, or self-perception of the interviewees. Slater (1990: 56) points out that "if the completed survey report will result in useful feedback to the contributors then there is good reason for spending time and effort on completing the questionnaire". Therefore the purpose of a questionnaire had to be made clear to the respondents.

3.6.1.1.1 Open-ended questionnaire

The open-ended-questionnaire (see Appendix E) requires the respondent to use his or her own words in giving responses. Powell and Connaway (2004: 128) explain that these "are designed to permit free responses from participants rather than ones limited to specific alternatives". This type of questionnaire, according to O'Sullivan, Rassel and Berner (2008), helps avoid biases that a list of responses can introduce; yields rich, detailed comments, helps a researcher identify a range of possible responses; and gives a respondent the chance to elaborate on responses. In a questionnaire that measured KM at MCNY, for example, one had to clearly define "KM" as well as the correspondence between the questions and this definition, thereby establishing its truth value. Vinten (1995: 29) provides the following ideas on what to keep in mind when creating questions for an open-ended questionnaire:

- open questions should be the means of achieving the advanced knowledge that is a prerequisite for formulating a closed question;
- when one is dealing with a group of people whose level of knowledge is unknown or is highly variable, then the open question is preferable;
- for sensitive or threatening questions the open question is recommended; and
- the open format will be suitable if one is discussing organizational change, reorganization of staff or working procedures, and increasing effectiveness among other applications.

It was therefore important to construct a closed-ended questionnaire with the use of information from an open-ended one. This is corroborated by Powell and Connaway (2004) who see an open-ended questionnaire as useful for exploratory studies.

3.6.1.1.2 Closed-ended questionnaire

A closed-ended questionnaire uses fixed responses or structured questions. They can be single choice, multiple choice, or rating scales (Powell, 1997; Slater, 1990). These easily accommodate pre-coding since the responses are stated, and that facilitates the analysis of data gathered (Powell and Connaway, 2004). The first type that is constructed for single

choice responses requires either a "yes" or a "no" as a response. The second type is where multiple responses can be selected as required. Slater (1990) puts emphasis on the fact that the researcher must have a clear definition of the objectives of the research before being able to ask the appropriate questions. This begs for clarity and precision in the questions that are used in the questionnaire.

The third type "utilizes scales of one type or another in order to obtain responses" (Powell, 1997). Examples of such scales include the Thurston-type scale used for measuring social attitudes, the Guttman scale used for measuring social distance when examining data obtained, and the Likert scale (Powell and Connaway, 2004). These are discussed in the questionnaire design section, and were the choice for this study. O'Sullivan, Rassel and Berner (2008) are of the view that the content of the questionnaire, the type and number of questions help ensure its reliability and operational validity as a research instrument. According to Vinten (1995: 28) in a closed-ended questionnaire:

- the closed question suffices where all that is required is to classify the respondent according to agreement or disagreement with some stated point of view;
- if the respondent has a clear-out attitude on a topic, having acquired sufficient background information and given the topic adequate thought, then the closed question may work;
- the closed question requires less effort. There is therefore less chance of non-response or a "don't know" answer; and
- ask a series of questions, beginning with open ones, then going over to closed ones as the subject matter becomes more clearly structured, enabling more specific questions to be asked.

According to O'Sullivan, Rassel and Berner (2008), the advantage of this type of questionnaire is that questions can be compiled and analysed quickly. The disadvantage is that sometimes the responses provided by the researcher may not match exactly what the respondent understands from the question, hence an inaccurate response results. Powell and Connaway (2004) also suggest that the omission of possible responses can

introduce bias. They suggest the inclusion of both structured and unstructured questions sparingly to get as much useful data as possible. In this study, the use of an open-ended interview as a component of data accumulation cancelled out the need to put that suggestion into use.

3.6.1.2 Length of questionnaires

There does not seem to be an agreed definite length of a questionnaire. However, Powell (1997: 106) states that "the general rule is that the questionnaire should be as short as possible to encourage complete responses". This assertion is supported by a study in the cabinet making industry by Smith *et al.*, (2003), and by Galesik and Bosnjak (2009: 349) who found that "the longer the stated length, the fewer respondents started and completed the questionnaire". According to Adams and Cox (2008: 19), "people's attention spans mean that long questionnaires completed less accurately as people rush to finish them". Additionally, they go on to explain that long questions make respondents avoid reading the questions thoroughly, and as a result the tendency to give inaccurate responses is high. In making the questions for the questionnaire items in this study, there was a deliberate avoidance to make questions that would be unnecessarily long, and the questionnaire itself was short.

3.6.1.3 Design of questionnaire

O'Sullivan, Rassel and Berner (2008: 235) point out that:

> the physical layout of the questionnaire affects its utility…the design of the pages may also affect the response rate and the quality and quantity of information obtained…a well-designed questionnaire may communicate to the respondent the seriousness of the research effort and favourably affect her inclination to respond.

According to Vinten (1995), when questions are arranged from the general to the specific, then responding also tends to be gradual and willing. This is done to make sure that the questions used are useful for the success of the research.

The questionnaire used in this study was based on the online diagnostic tool for knowledge audits created by Sharma and Chowdhury (2007), with modifications to suit the needs of the researcher. In terms of the actual questions, a checklist of what KM means in academic libraries was made with the use of the studies of Branin (2003) at the Ohio State University libraries, and the public library case study of Hamid and Nayan (2007) at the National Library of Malaysia. Experiences in what librarians perceive as the use of KM principles in libraries were referred to, for example, Ajiferuke (2003) in a case study of libraries in Canada; Rydberg-Cox *et al.,* (2000) in their Perseus Digital Library; Williams *et al.,* (2004) in the Eskind Biomedical Library at Vanderbilt University Medical Centre; Hayes (2007) at the library of the University of Edinburgh; and Hamid *et al.,* (2007) at the National Library of Malaysia. All these gave insight into what kind of content to include as questionnaire items that resonate with the research questions.

When using a questionnaire, one needs to consider how the responses will be organized. One way of doing so is through assigning codes to the various responses to particular questions in the questionnaire (Kumar, 1999; Maxwell, 1996; O'Sullivan, Rassel and Berner, 2008). In the questionnaire used in this study, data coding was done by giving item codes that were the numerical values of each response, and that included a code for unavailable data too. To enhance the chances of getting balanced responses, an equal number of positive and negative statements were used. The choices, which were translated into numerical values, were representative of the importance of each item or attitude as suggested by O'Sullivan, Rassel and Berner (2008). The resultant data were reflective of KM principles and practices that were perceived by the researcher to be in place or not in place at MCNY.

The use of the closed-ended questionnaire was to obtain quantitative-based results. Because people's opinions were sought for, the type of scale used needed to be an affective one, such as the Likert scale (Leedy and Ormrod, 2005). Affective scales include the Guttman scale, the Likert scale, and the Thurston scale, among others. The Guttman scale is made from data collected, rather than made for facilitating the process of data collection. For that reason it was viewed as not appropriate for this study. The

Thurston scales, on the other hand, involves a complicated system of weighting the questionnaire items, therefore highly time consuming. For that reason it was not used as an option in this study. Both the Guttman scale and the Thurston scale are not widely used in current research because of the expense involved in creating them.

The design of the questionnaire was based on a Likert scale type of frame, which is useful for measuring attitudes (Powell and Connaway, 2004). Its purpose was to develop "strategies for improvement of a service or intervention, or to formulate policy, eliciting attitudes on various aspects of the issue under study…" (Kumar, 2005: 144). The values were on a 5-point scale which rates attitudes for example from "strongly agree", "agree", "neutral", "disagree", "strongly disagree". All the variables were given similar values, and the weights of the choices were equal. According to O'Sullivan, Rassel and Berner (2008: 308), when creating a Likert type scale:

> five categories are commonly used: strongly agree, agree, neutral or no opinion, disagree, and strongly agree. Some forms omit the neutral category, and some add even more categories to permit finer distinctions.

This type of questionnaire required a respondent to make a choice from a list of responses.

3.6.1.4 Pretesting questionnaires

It is necessary to pre-test a questionnaire after it has been informally evaluated in order to refine the questions (Powell and Connaway, 2004). The same authors also point to the fact that ideally the pre-test sample should be as scientifically selected in the same way and as thoroughly as the sample for the final study. This approach was useful for a study at MCNY especially because there was a linguistically and culturally diverse population, therefore a clear, unambiguous understanding of the meaning of questions was critical. The literature surveyed in this research points to an absence of recommendations about the appropriate number of individuals required for pretesting a questionnaire, although there is consensus about the importance of pretesting. However, Bradburn, Sudman and Wansink (2004: 317) suggest that it is important to "at least pre-test your questionnaire

with ten to twelve colleagues (or better yet) with representatives from the population you will be surveying". This number is confirmed by Simmonds and Andaleeb (2001) as well as Powell, Baker and Mika (2002) who all suggest the number of 10. On the other hand, Mark (1996) suggests a "sufficient" pre-test sample. What this says is that the exact size depends on the aims of the researcher planning a pre-test. For this research, the decision was to pre-test the questionnaire on 5 individuals, one from each of the different groups of MCNY employees, and none of whom were part of the actual study sample.

From the pre-tested questionnaire, it became less complicated creating a final instrument for the actual investigation. The order of the questions was viewed as important to the way the responses would be obtained. DeMoranville, Bienstock and Judson (2008: 255) suggest that researchers should "order questionnaire items differently depending on how the results will be used and which type of measure, specific or global service quality, is the focus of a questionnaire".

3.6.1.5 Administering the questionnaires

Questionnaires can be distributed by conventional mail using the postal system, or electronically using e-mail. This depends on the available infrastructure surrounding the respondents. Powell (1997) as well as Powell and Connaway (2004) are very clear about the need to include a self-addressed stamped return envelope when distributing a questionnaire by conventional postal methods. This is done to increase the response rate. Slater (1990: 53) says that the "response rate is very important for the success of any survey and a questionnaire that people will not answer can produce a worthless survey result".

Powell and Connaway (2004) point out factors that help improve the response rate of postal questionnaires as: having a cover letter that explains the purpose of the questionnaire as well as emphasizing the importance of the respondent's responses to accompany the questionnaire; it is useful to have a letter head to lend some authority to the study; a second letter signed by a person influential to the study; guaranteeing

confidentiality of responses and anonymity to respondents. Fowler (2002: 42) also points out that "people who have an interest in the subject matter or the research itself are more likely to return mail questionnaires than those who are less interested".

While the use of electronic questionnaire differs from the use of postal mail method in the mode of distribution, the attributes that relate to question layout, validity and reliability, response rate, and so on, are the same. According to Powell and Connaway (2004), sources of error for electronic questionnaires include those encountered in postal questionnaires. These include researcher bias, that is, "the researcher's unconsciously developing the questionnaire in a manner that will increase the likelihood of obtaining the desired results" (Powell and Connaway, 2004: 138); a lack of clarity about the purpose of the questionnaire; differing respondent interpretations; rate of responses may be low, resulting in less than representative data; and the mood of the respondents as they answer the questions.

There are many online data collection tools available that can be used in the survey process. Among them are LibQUAL+, SurveyMonkey (2009) and Zoomerang, to name the few that have been widely used in library environments (Hernon and Schwartz, 2005), and LimeSurvey (an open source web surveying platform). Each of them offers essentially similar functions, but different fee structures. The common features include survey design, data collection, and have verification and data analysis tools. Confirming the spirit of the current study, Hernon and Schwartz (2005) suggest that while automated data collection tools can be very useful, they should be used to complement and support the research process rather than be used as a way of avoiding the actual research experience.

Examples of studies that have used e-mail or the web to distribute web-based questionnaires include the use of Zoomerang to survey information seeking behaviours of library users in a digital library by Makani and WooShue (2006); or the survey on academic librarians' involvement with new technologies in libraries to keep up-to date with professional literature by Hardesty and Sugarman (2007). SurveyMonkey was used

by the University of North Carolina at Chapel Hill (2009) in investigating the planning and tracking of LIS professionals in the United States. It was also used by the Association of College and Research Libraries in evaluating its summer 2009 webcasts. The use of LibQUAL+ has been mostly by members of library consortia in undertaking large-scale surveys on perceptions of library service quality. In the literature surveyed, LimeSurvey was not widely used and therefore in this study it was not considered for use. All of them found the web-based surveys to be easy to distribute and convenient in the presentation and analysis of results.

The experiences of other library science studies in using web-based surveys as explained above were perceived as useful in determining which tool to settle for in data gathering in this study. Web based distribution of the questionnaire using the SurveyMonkey tool was the choice of this study because every respondent had access to an e-mail address. This enabled them to complete the questionnaire at times that were convenient to them within the time period that the researcher specified.

3.6.2 Document reviews

The use of institutional documents as part of qualitative information gathering was important because they gave insight into the thinking within MCNY. These included the library handbook, library reports and documents on the origins of MCNY which are in the MCNY archive. Creswell (2003: 186) suggests that this is "an unobtrusive source of information, represents data that participants have given attention to compiling". Yin (1984: 80) points out that "the most important use of documents is to corroborate and augment evidence from other sources". Library database usage survey was also a part of the process of getting insight into information retrieval habits of the MCNY community.

3.6.3 Interviews

Interviews are an important part of any research project as they provide the opportunity for the researcher to investigate further, to solve problems and to gather data which could

not have been obtained in other ways (Cunningham, 1993: 93). The interview is essentially a qualitative data gathering technique that finds the interviewer directing the interaction and inquiry in a very structured or unstructured manner, depending on the interview's purpose (Denzin and Lincoln, 1994: 365). Merton, Fiske and Kendall (1990: 135) suggest that the focused interview with a group of people "...will yield a more diversified array of responses and afford a more extended basis both for designing systematic research on the situation in hand..."

According to Creswell (1994; 2007), a protocol for an interview is important, and its components include a heading; instructions to the interviewer; the key research questions; probes to follow key questions; transition messages for the interviewer; space for recording the interviewer's comments; and space for recording reflective notes. The structured interview protocol (see Appendix G) with open-ended questions was used in this study. The questions closely resembled those used in the structured questionnaire, but responses were not provided, allowing interviewees to elaborate on their open responses.

Interview questions are a way of translating research questions. Maxwell (1996: 74) points out that in an interview questionnaire "questions will generally be far more specific and diverse than the broad, general research questions that define what you seek to understand in conducting the study". Interviews are in several forms. Yin (1984: 83) mentions three types: "open-ended", "focused" and "structured" as "an essential source of case study evidence".

The problems highlighted, include bias, poor or inaccurate articulation, and poor recall. However, in controlling researcher bias, face-to-face interviews help because they allow the researcher to get responses to specific questions, rather than trying to speculate on the possible explanations for certain phenomena. The researcher "hears their explanations of their behavior" (O'Sullivan, Rassel and Berner 2008: 40). The face-to-face interviews formed a part of the qualitative data collection element of this research. Each interview session lasted for a maximum of 40 minutes, a time limit based on having pilot-tested the interview questions on two different individuals.

3.6.4 Observation

According to Powell and Connaway (2004: 157):

> observation means to watch attentively in a scientific manner. …is one of the oldest forms of data collection, but, in order to qualify as a scientific observation, it should … be systematic, objective, and free from bias; quantitative whenever possible; and strong in usability, reliability, and validity.

The same description is given by Leedy and Ormrod (2005) in their explanation that observational studies are a type of qualitative research in which a particular aspect of behaviour is observed systematically and as objectively as possible. Baker (2006: 173) points out that the:

> role depends on the problem to be studied, on the insiders' willingness to be studied, and on the researcher's prior knowledge of or involvement in the insiders' world. Going into a new environment may require the researcher to adopt the role of complete observer, whereas studying a group in which she/he is already a member allows the researcher to adopt the complete participant role.

Powell and Connaway (2004) list the advantages of observational research to include the possibility to record behaviour as it occurs; it allows a comparison between what people say they did against what they actually did; the possibility to observe behaviour or actions that people may not see as relevant or important; the possibility to study subjects who are not able to give verbal reports. However, they also list disadvantages that include the fact that an observer is not always able to anticipate events; some activities or events are too private in nature to be observed; quantifying data obtained from observation is not easy.

Creswell (1994), and Onwuegbuzie, Jiao and Bostick (2004) point to the importance of an observation protocol, or form to note observations in the field. Appendix H is the observation protocol used in this study. Its components include basically descriptive notes from the sessions observed, and reflective notes arranged chronologically, followed by a summary and conclusions about activities (Creswell, 2007). Observation can be in two forms, structured or unstructured.

Structured observation is formal and has a focus on designated behaviour aspects (Powell and Connaway, 2004). In other words, the researcher has advance knowledge of the criteria to apply to observed behaviour; it is systematic and has a predetermined structure. Leedy and Ormrod (2010: 147) suggest that observations used for gathering qualitative data are "intentionally structured". Creswell (2007) points out that this process requires one to have permission; to identify what it is that is to be observed; to design an observation protocol to record notes in the field. Powell and Connaway (2004) add that the structured observation technique uses rating scales for recording the degree to which characteristics or behaviours are present, or the frequency of certain actions. Because it reveals how often things happen rather than why they happen (Powell and Connaway: 2004), structured observation forms only a part of data collection.

According to Powell and Connaway (2004), unstructured observation is the same as participant observation. Slater (1990) notes that observation can be done unobtrusively and with minimal participation, but an actual survey may be needed to correctly understand the reason for certain events taking place. Baker (2006: 172) suggests that:

> despite the level of involvement with the study group, the researcher must always remember her/his primary role as a researcher and remain detached enough to collect and analyze data relevant to the problem under investigation.

Participant observation is a type of qualitative research that includes the researcher in the activities in a setting that is "natural" (Kumar, 2005: 121) to the participants. This way "the investigator learns how people behave" (O'Sullivan, Rassel and Berner 2008: 40). In addition, "the investigator may take a variety of roles within a case study situation and may actually participate in the events being studied" (Yin, 1984: 86). Creswell (2003: 186) notes the advantages of observations as that:

> the researcher has firsthand experience with participants, the researcher can record information as it is revealed, unusual aspects can be noticed during observation, and it is useful for exploring topics that may be uncomfortable for participants to discuss.

In this study, a structured observation protocol (see Appendix H) adapted from Creswell (2007: 137) was used. Additionally, the observation of knowledge use events and objects that have relevance to KM was based on a paper by De Long (1997), research by Daud, Rahim and Alimun (2008) and by Stankosky (2005), both referred to in Chapter Two, and on the research questions used in the questionnaire (see Appendix F). Peripheral to these observations were the kinds of materials kept in the library and databases, the library website, communication between librarians and faculty, the technology available in the library, and the library building. The staffing situation in the library was perceived to have a bearing on staff efficiency and effectiveness, as well as on the way they attend to user needs. The way librarians communicated with faculty was also observed because, to an extent, it could reflect a presence or absence of the collaborative spirit.

Each observation session lasted for 60 minutes, as suggested in a study of United States classrooms by Waxman and Padrón (2004). The observations were done over the same period as data were also being collected using the web-based questionnaire. There were 22 sessions (that is a total of 22 hours) at the rate of one hour per day that the library was open in November 2009. The sessions were distributed in such a way that seven took place before lunch, another seven after lunch, and the last eight were in the early evening. This allowed for observation at different times of a normal day in the operations of the MCNY library.

The problem was that there could have been researcher bias, potentially resulting in the same observations yielding different interpretations if performed by different observers. Use of the observation protocol was to enhance reliability of the results from the questionnaire and interviews.

3.7 Data analysis and presentation

Data analysis relates to what is done with the information collected from the research process in order to make sense of it. When dealing with a case study, Yin (1994) suggests that a researcher needs to determine how to analyse evidence before beginning the data

collection process. He proposes strategies for data analysis. The first strategy relies on theoretical propositions. It involves the use of literature review and research questions to determine the objectives and design of the case study. Additionally, the data collection methods and data analysis are also determined by the theoretical propositions. The second strategy, used in the absence of theoretical propositions, is a descriptive framework for a case study. This is useful where the researcher has found gaps in the current literature, and used that to formulate the research questions, so that the data collection methods and research strategies are derived from the research questions and objectives.

Yin (1994) suggests four dominant modes of data analysis in a case study. They are pattern-matching, explanation-building, time series analysis, and programme logic models. Pattern-matching means a comparison of "an empirically based pattern with a predicted one" (Yin, 1994: 106). Research whose results comply closely with the pattern-matching comparison strengthen the internal validity of the research. Explanation-building is a type of pattern-matching which tries to provide an explanation for a case. Its goal is "to analyze the case study data by building an explanation about the case" (Yin, 1994: 107). The third mode is time series analysis which is a collection of observations of clearly-defined data items obtained through repeated measurements over time. Lastly, programme logic models are a mixture of pattern-matching and time-series analysis. The focus, from these suggestions by Yin (1994), is on internal and external validity. Creswell (1994: 156) acknowledges the propositions for data analysis by Yin (1994) when he also mentions "patterns predicted from theory or the literature, explanation-building, and time-series".

Leedy and Ormrod (2005) suggest steps for data analysis. They are the logical arrangement of the details of the case being studied, categorization of data, the examination of bits of data for their relevance towards the case, analysing the data for underlying themes and patterns, and lastly the synthesis of results and generalizations arising thereafter. According to Leedy and Ormrod (2005: 136), "ultimately, the

researcher must look for convergence (triangulation) of the data: many separate pieces of information must all point to the same conclusion".

Triangulation suggests that there is an analysis of data from different sources, by combining qualitative and quantitative results. According to Creswell (2009: 218), "data analysis in mixed methods research relates to the type of research strategy chosen for the procedure". In this case, the concurrent procedure was in place, that is, where qualitative and quantitative approaches were used to "confirm, cross-validate, or corroborate findings within a single study" (Creswell, 2003: 217).

Woolley (2009: 8) says that the "quantitative and qualitative approaches are used to address different aspects of the research problem, in order that a fuller picture might be developed and can be regarded as complementary". In other words, quantitative data were collected and analysed to produce one set of results; and qualitative data were collected and analysed for another set of results. The two sets of results were compared and contrasted to produce a single interpretation. Johnson and Onwuegbuzie (2007: 22) suggest a mixed methods process model for data analysis with the following stages: data reduction, data display, data transformation, data correlation, data consolidation, data comparison, and data integration. This is illustrated in Table 9.

Table 9: Stages of the mixed methods data analyses process

Stage	**Definition**
1. Data reduction	Reducing quantitative data (e.g. descriptive statistics, exploratory factor analysis) and qualitative data (e.g. exploratory thematic analysis, memoing)
2. Data display	Reducing quantitative data (e.g. tables, graphs) and qualitative data (e.g. matrices, charts, graphs, networks, lists, rubrics, Venn diagrams)
3. Data transformation	Qualitizing and/ or quantitizing data (e.g. possible use of effect sizes, exploratory factor analysis)
4. Data correlation	Correlating quantitative data with qualitized data
5. Data consolidation	Combining both data types to create new or consolidated variables or data sets
6. Data comparison	Combining data from different data sources

7. Data integration	Integrating all data into a coherent whole or two separate sets (i.e. quantitative and qualitative) of coherent wholes

Source: Onwuegbuzie and Teddlie (2002: 357)

Presentation of results was through written descriptions, numerical summarisations, and figures. According to Creswell (2009: 218), "this involves creating codes and themes qualitatively, and then counting the number of times they occur in the text data". This enabled a comparison between quantitative and qualitative data, a stage similar to what Yin (1994) refers to as pattern-matching comparison. The two data sets were then compared to each other to correlate possible similarities or differences in the data, and then interpretations and conclusions made.

3.8 Evaluation of the research methodology

This is an evaluation of a mixed methods research methodology used in this study. The sources of data included documents, archival information, interviews, a questionnaire, direct structured observation, and physical artefacts. The rationale for using this methodology was that information from any single source would not provide sufficient data or explanations. According to Ngulube, Mokwatlo and Ndwandwe (2009: 105), "using MMR provides researchers with the possibility of addressing issues from a large number of perspectives. That in turn may enrich and enhance the research findings". This is a view shared by Bryman (2006) and Creswell *et al.*, (2003) who suggest that a mixed methods approach can allow for the limitations of each approach to be minimized while strengths are built upon, thereby providing stronger and more accurate inferences. This means that data collection and data analysis techniques were in the context of a mixed methods approach.

The triangulation design type was preferred in this case due to its ability to accommodate both types of research running concurrently. Triangulation was used for corroborating and testing the consistency of the findings obtained from both qualitative and quantitative

methods. It was useful in controlling the tendency to make false conclusions. In addition to the suggestion made by Woolley (2009: 8) that "quantitative and qualitative methods provide differing perspectives on a subject and this is why the use of both may be viewed as complementary rather than validatory", mixed methods also enables corroborating and confirming facts. This coincides with the suggestions of Ngulube, Mokwatlo and Ndwandwe (2009) and Greene, Caracelli and Graham (1989) that triangulation, completeness and complementarity are some of the purposes of using mixed methods research.

According to Ngulube, Mokwatlo and Ndwandwe (2009), a shortcoming in using the mixed methods research methodology can be that there is not always a perfect balance between the qualitative and the quantitative elements. This view concurs with that of Johnson and Onwuegbuzie (2004) who suggest that it may be difficult for one researcher to carry out a mixed methods study if the qualitative and quantitative phases are to be taken concurrently. This may be a case for the requirement to have a team of researchers who complement each other. Additionally, the mixed methods methodology has been employed under different names, with the potential to limit the availability of readily available examples to use or refer to. Another weakness is that researchers may sometimes have a low appreciation of reporting problems or challenges encountered while using mixed methods research therefore do not report them (Ngulube, Mokwatlo and Ndwandwe, 2009). This compounds the lack of information on mixed methods research.

A case study was suitable for this research because the focus was unique and sought to understand the particulars of MCNY and its library in its own complexity. The limited time scale for the research made the case study approach appropriate since it allowed for the investigation of a particular phenomenon to some depth in a short time. The action research context where the observer was a participant could result in prescriptive solutions which would be interventionist. The final question to focus on was "how to". The knowledge that this was a continuing research agenda, and putting the case study into the context of action research was to enable interventions and repeating the process

even after the time allocated for this research elapsed. This is because action research can lead to action learning, or conversely, action learning may be regarded as an application of action research (Argyris, 1993).

A limitation in the database usage statistics was that the data did not indicate the identity of users by category. This was due to the use of a single generic login identity by all users of MCNY library databases. It would have been useful to tally the responses of faculty with their actual use of databases. Additionally, the fact that KM is a process means that some issues covered in this study may develop over time and may be handled and understood in more detail over a longer period of time as in the case of longitudinal studies.

3.9 Chapter summary

The chapter focussed on research methods and the methodology in place. This case study was used in an action research process, using mixed methods research methodology. It was established that an analysis of quantitative data uses quantitative methods and qualitative data uses qualitative methods to have mixed methods results. Triangulation was revealed to be a multifaceted concept that can be explained from different stages in the research process. Literature that supports or refutes use of the processes was analysed.

Observation and a web-administered questionnaire using the SurveyMonkey tool were used. Additionally, data were obtained from some institutional documents, and face-to-face interviews. There was need to use a random sample to obtain quantitative data as well as purposive sampling for qualitative data, so as to corroborate results.

It was also important to consider the scope and limitations of the study as an acknowledgement that it is open to comment, and/ or improvements. It was established that the concept of validity in mixed methods research was still under examination by some researchers.

CHAPTER FOUR: FINDINGS AND PRESENTATION OF RESULTS

Let knowledge grow from more to more,
But more of reverence in us dwell;
That mind and soul, accordingly well,
May make one music as before.
Tennyson (1971: 120)

4.0 Introduction

The findings presented from the research in this study originated from both the qualitative and quantitative methodologies. The descriptive part reflects the qualitative element, while the statistical part reflects the quantitative one. The presentation of findings was guided by themes from the research questions that were specified as:

- What do librarians, faculty, and administrators understand KM to mean?
- What are the knowledge needs of the MCNY community?
- What knowledge retention policies, practices and gaps are in existence at MCNY?
- What modern technologies are in use at MCNY that enhance the environment for KM practice?
- What are the tools, methods and techniques used for knowledge retention--knowledge assessment, knowledge acquisition and knowledge transfer at the MCNY library?
- What are the recommendations on implementing KM practices that enhance the value of library service at MCNY?

The presentation of results was in the form of data reduction, data display, and data transformation, in a manner that simplified it. According to Wilkinson (2000: 78):

> Before analysing data, it must be classified or coded in some way. In doing this we are preparing the data for analysis. Some people refer to this as cleaning or organising data. For example, data could be organised by entering it into a

computer or grouping it into batches relating to the date it was received. Another method of coding would be to convert the responses in a questionnaire into, for example, numeric form.

In other words, it is an "organized, compressed assembly of information that permits conclusion drawing and/or action taking" (Miles and Huberman 1994: 429). Using the suggestions from mixed methods research, data display refers to the ways that the reduced data are displayed in diagrammatic, pictorial or visual forms in order to show what those data imply. According to Onwuegbuzie and Teddlie (2002), analysis refers to reducing quantitative data (for example, tables and graphs) and qualitative data (for example, matrices, charts, graphs, rubrics, Venn diagrams).

4.1 Quantitative findings

Distribution of the web-based questionnaire (see Appendix F) was done with the use of the web-based SurveyMonkey tool. Another set of quantitative results was obtained from the structured observation (see Appendix H) findings. The first part of this section was focused on presenting the questionnaire results. The second part of it was the structured observation findings.

The presentation of the results did not necessarily follow the actual sequence of the questions in the questionnaire, or those of the issues addressed by the structured observation. Instead, results from the research questions were organized into categories that could appropriately address the research objectives that were expressed in the research questions. The data were presented in figures and tables, besides the descriptive parts.

4.2 Questionnaire

A total of 40 questionnaires out of 79 were completed. This was 50.63% of the total sample. The response rate was consistent with the findings of Greenlaw and Brown-

Welty (2009) who found that a response rate of 51.58% from a web-based survey tool was higher than many response rates of that type of survey as reported in literature. It was also consistent with the findings of Leysen and Boydston (2009) whose web survey attracted a response rate of 51.7% in a study of cataloguer librarians. Kittleson and Brown (2005: 11) point out that "a 40-50% response rate may indeed be outstanding when one considers the amount of information overload to which many users are exposed", and they also suggest that the response rates from web based surveys continue to decrease. However, one of the weaknesses of a low response rate is that it is difficult to confirm the validity of the conclusions beyond the current study (Leysen and Boydston, 2009).

Reminder messages were sent out on the 14th and the 15th day into the data collection period, after 20 responses had been received. The message was identical to the first mailing with the addition of a statement indicating that the researcher had not received a response to an earlier request. The survey link was also included with the reminder. All participants were sent reminders, with an apology to those who had already responded and thanking those that had already completed, and requesting those who had not done so to complete the survey. This practice was consistent with the suggestions of the Association of Research Libraries (Green and Kyrillidou, 2010). After 31 days of data collection, the questionnaire link was closed. That resulted in any potential respondents receiving the message that the questionnaire was no longer available if they clicked on the link after the deadline.

All usable responses were analysed using SurveyMonkey and Microsoft Excel. Although SurveyMonkey could create tables successfully, the researcher migrated some of the data into Microsoft 2007 Excel spreadsheets. The reason was that the tables and figures created by SurveyMonkey did not always depict the intended picture. Microsoft Excel was found to have more templates for data manipulation. On the other hand, SurveyMonkey had a cross tabulation function that the researcher found useful in making associations between and across questions.

Most of the levels of measurement in the questionnaire were ordinal. O'Sullivan, Rassel and Berner (2008: 106) explain that "ordinal scales measure characteristics by determining that one case has more or less of the characteristic than does another case". The measurements in this study included a Likert type rating scale to indicate the strength of responses to the questions (see Appendix F). The scale was created in such a way that 1 = strongly agree, 2 = agree, 3 = neutral, 4 = disagree, and 5 = strongly disagree. Rating averages (or the weighted average) were calculated in SurveyMonkey to indicate tendencies towards "agree", "neutral" or "disagree". That meant that if there were more "agree/ strongly agree" responses, the rating average was small, while the "disagree/ strongly disagree" responses attracted the larger rating average of 5. If 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree, then for more "agree/ strongly agree" responses, the rating average was large and almost reaching 5, while the "disagree/ strongly disagree" responses would attract a small rating average within the range of 1. The results were then presented descriptively and in figures that indicated the "agree", "neutral" and "disagree" categories, with explanations that included the values of the rating averages. In the figures, percentages were rounded to two decimal places whenever applicable.

4.2.1 Characteristics of respondents

All respondents were employees of MCNY in 2009 and each had a College e-mail address. They all had computer and internet access at the time of this study. On examining responses, 22 (54%) were from part-time faculty. The total number of incomplete responses from the questionnaires received was 20 (25%) of the whole sample. According to SurveyMonkey, the largest number, 18 (90%) of incomplete responses was from part-time faculty.

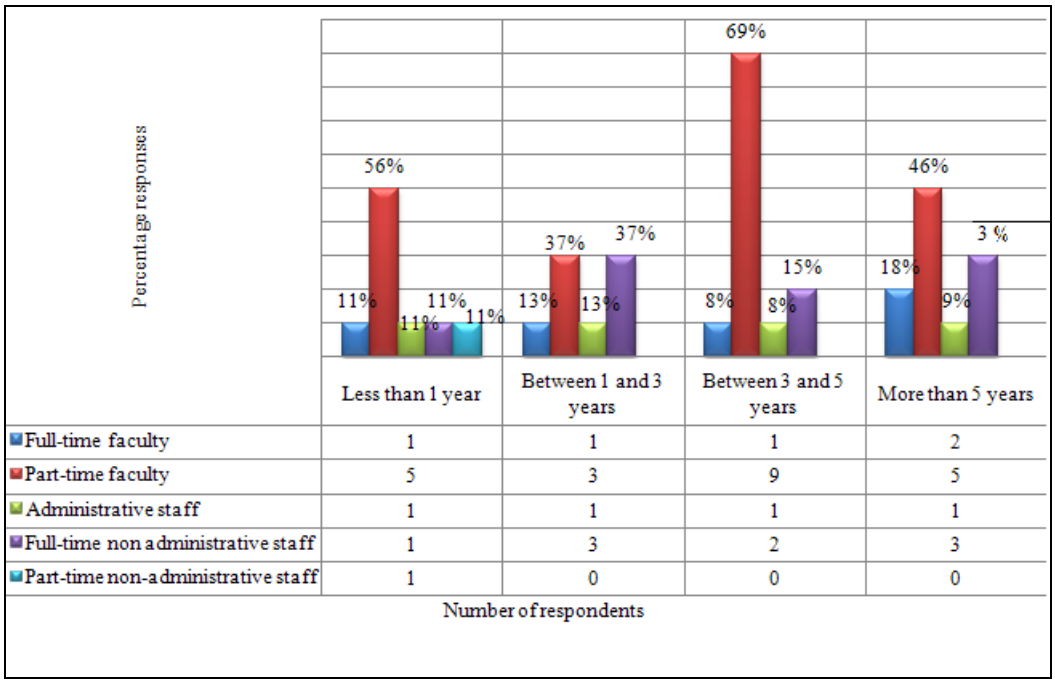
From a sample of 4 of the 20 administrators, 4 responses were expected, and all (100%) responded. From a total of 28 full-time faculty, a sample of 5 was selected, and all 5 (100%) responded to the questionnaire. Also received were 9 respondents (22%) of the whole sample of 79 from non-administrative full-time staff. From a sample of 11 that was

selected from this group, the 9 responses made for 82% of the responses from their category. In regard to the total of 6 non-administrative part-time employees, 2 questionnaires were deployed and 1 (50%) was received completed. That made 2.4% of the whole sample population. Only 1 individual out of the whole sample did not give consent to participate. In that case, SurveyMonkey closed the questionnaire to avoid bothering the individual.

Questionnaire respondents' years of working experience at MCNY varied from under one year which accounted for 9 (22%) to 11 (27%) who had worked for more than five years. Thus, the data reflects a wide range of experience at MCNY. In the "more than 5 years" category were some who had been at MCNY for more than 15 years, therefore were assumed to have a thorough knowledge of the way MCNY and its library functioned.

In the "less than one year category", 5(56%) responses were from part-time faculty, while 1 (11%) was from the full-time category, the administrative category, the full-time non-administrative category, and from the part-time non-administrative category. In the "one to three years" category, there was 1 (13%) each from the full-time faculty and from the administrative categories, while 3 (37%) each was from the full-time faculty and from the full-time non-administrative categories. There were 9 (69%) from the part-time faculty, 1(8%) each from the full-time faculty and the administrative categories, and 2 (15%) from the full-time non-administrative category in the three to five years category. There were also 2 (18%) from the full-time faculty category, 5 (46%) from the part-time faculty category, 1 (9%) from the administrative category, and 3 (27%) from the full-time non-administrative category in the "more than 5 years" category. Figure 7 reflects all the respondents and their years of MCNY working experience.

Figure 7: Percentage responses by years of MCNY service and employee category



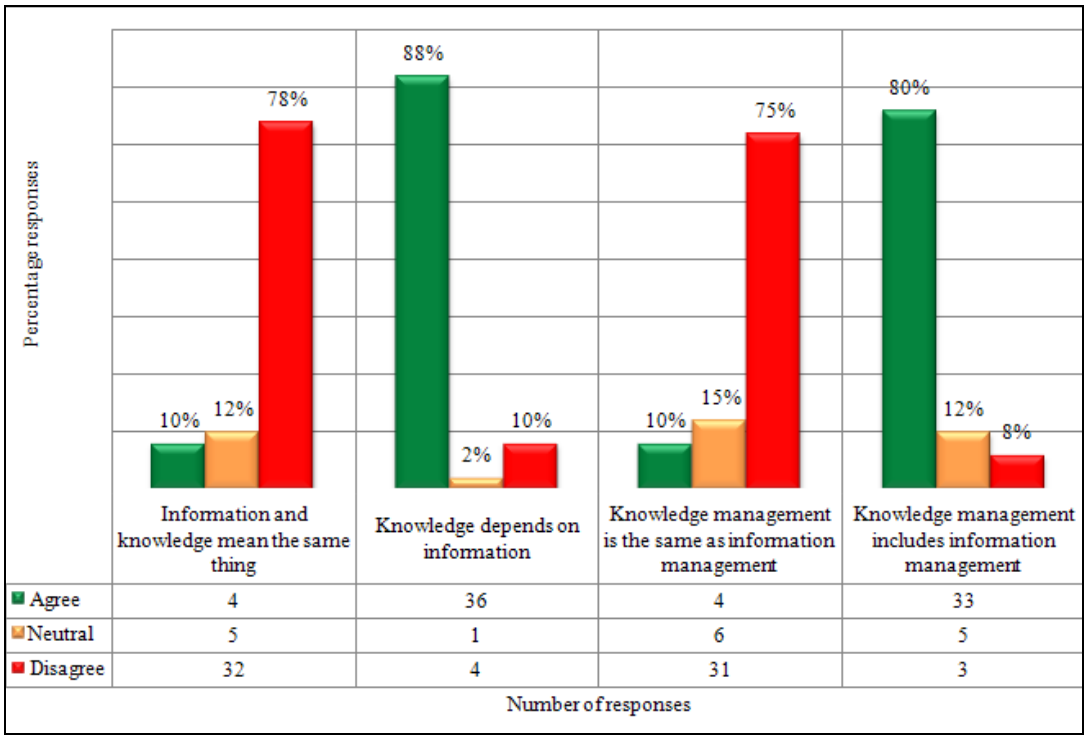
	Less than 1 year	Between 1 and 3 years	Between 3 and 5 years	More than 5 years
Full-time faculty	1	1	1	2
Part-time faculty	5	3	9	5
Administrative staff	1	1	1	1
Full-time non administrative staff	1	3	2	3
Part-time non-administrative staff	1	0	0	0

Number of respondents

4.2.2 MCNY understanding of knowledge management

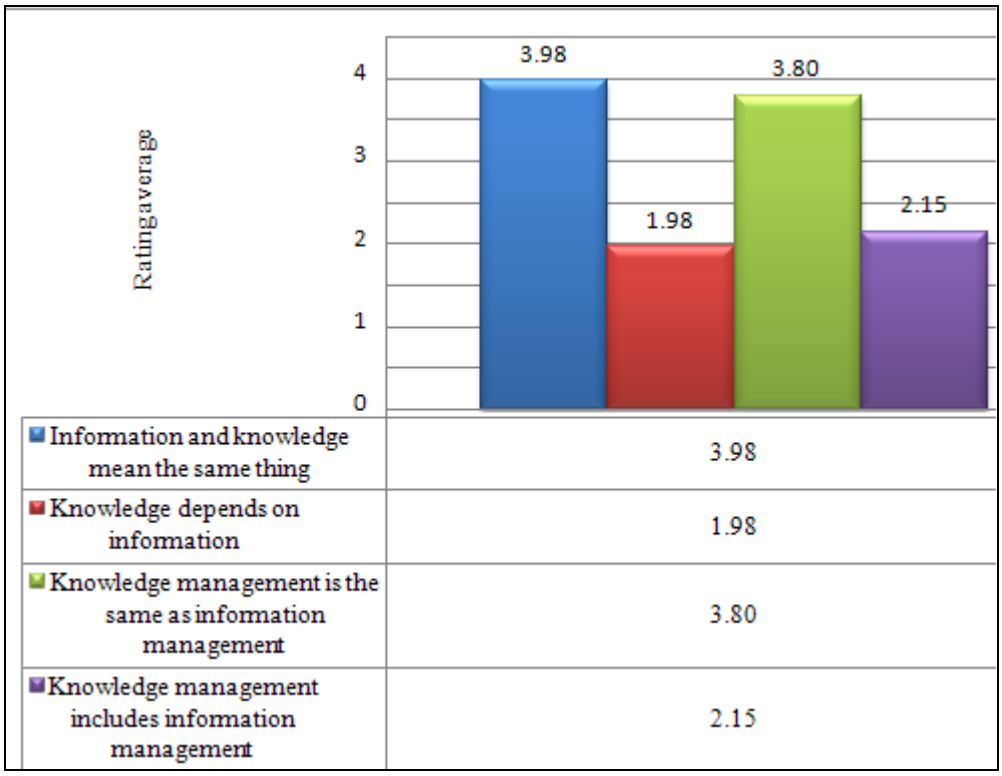
To find out what MCNY employees understood KM to mean, questions involving the relationship between knowledge and information were posed. Of all the questionnaire respondents, 32 (78%) disagreed that they mean the same thing, while 5 (12%) opted not to give an opinion, and 4 (10%) agreed. Another 36 (88%) respondents agreed that knowledge depends on information, while 1 (2%) was ambivalent, and 4 (10%) disagreed. The question of KM including information management had 33(80%) respondents agreeing, 5 (12%) not giving an opinion, and 3 (8%) disagreeing with it. Concerning whether KM is the same as information management, 31 (75%) disagreed, 6 (15%) gave a non-committal response, and 4 (10%) agreed. These perceptions are reflected in Figure 8.

Figure 8: Understanding of knowledge management at MCNY



A rating average of 3.98 in the perception that knowledge and information mean the same thing indicates that most responses were suggestive of disagreeing than strongly disagreeing. In the case of knowledge depending on information, a rating average of 1.98 indicates that the number of respondents who agreed was larger than those who strongly agreed. With regard to knowledge management being the same as information management, a rating average of 3.80 indicates that more respondents disagreed than those who strongly disagreed with that perception. There was a large number of respondents agreeing than strongly agreeing to the perception that KM includes information management as reflected by a rating average of 2.15. These rating averages are depicted in Figure 9.

Figure 9: Understanding of knowledge management at MCNY (rating averages)



All 4 (100%) administrative staff and 5 (100%) full-time faculty respondents were aware that knowledge and information do not have the same meaning. That is why the neutral and agree columns under their categories do not appear in Figure 10. Additionally, 15 (68%) part-time faculty were aware that knowledge and information have different meanings. A single respondent from the non-administrative full-time staff category and 3 (14%) part-time faculty viewed them as the same. There were non-committal responses from 4 (18%) part-time faculty and 1 (11%) from the non-administrative full-time staff category. This is demonstrated in Figure 10.

Figure 10: Knowledge and information mean the same thing

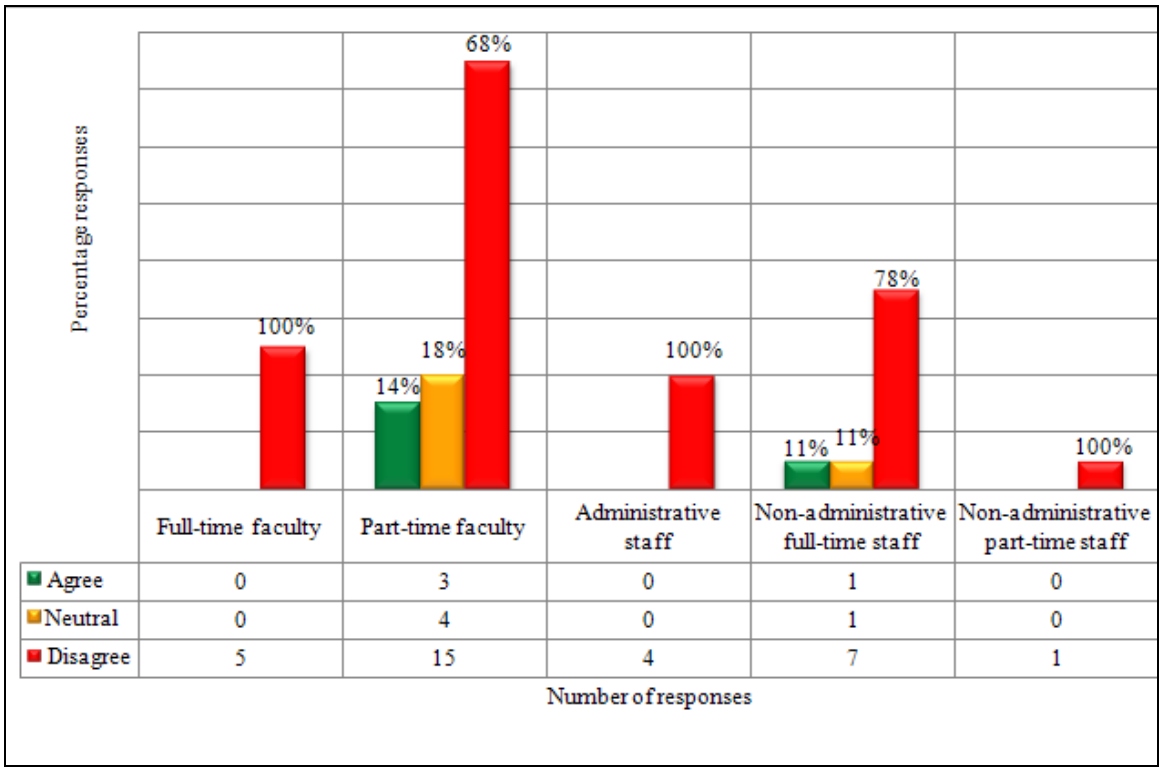
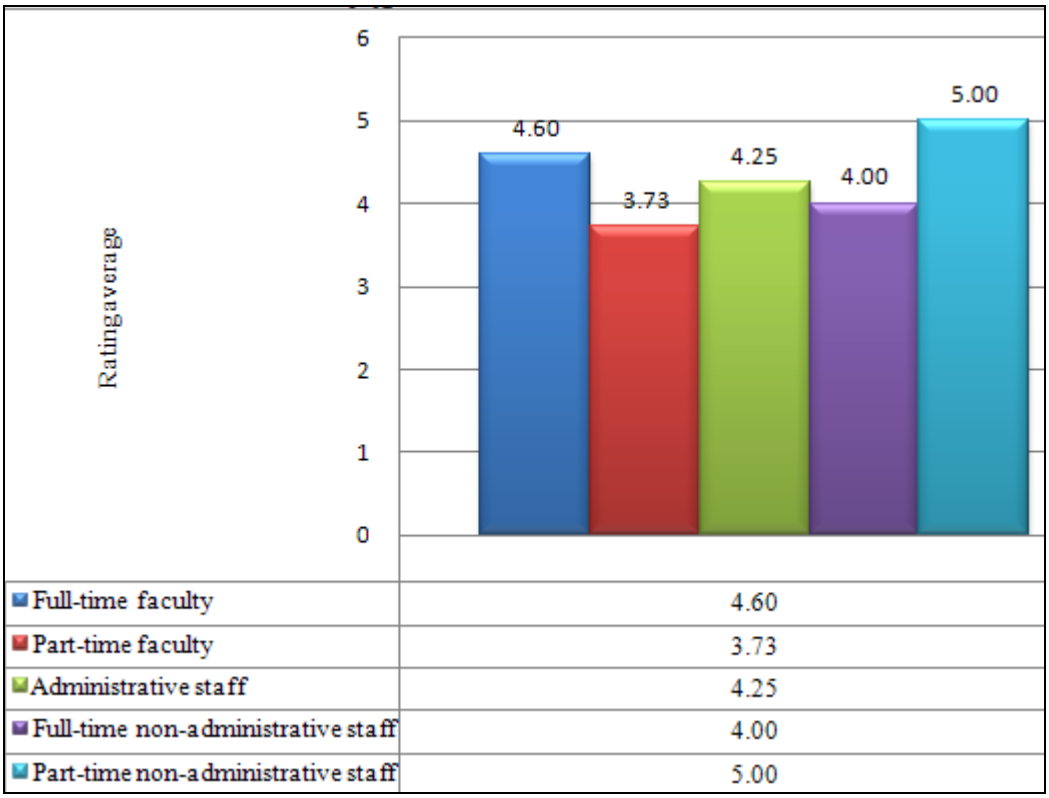


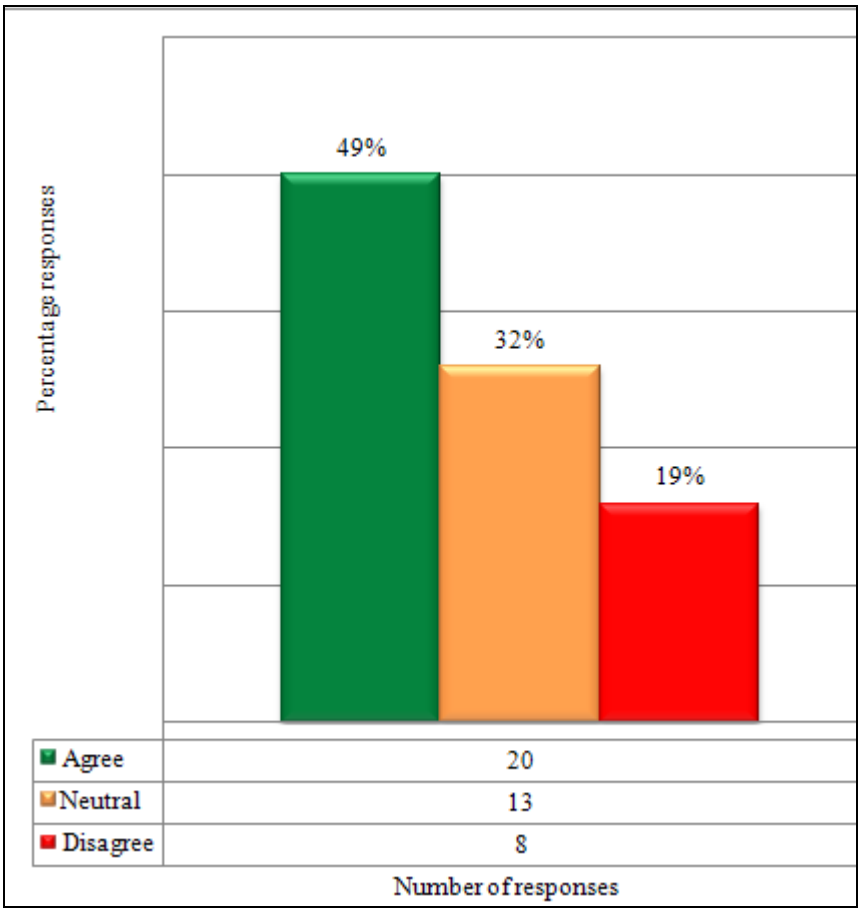
Figure 11 demonstrates the rating averages by category of MCNY employee. It reflects that full-time faculty, with a rating average of 4.60, strongly disagreed with the notion that information and knowledge have the same meaning. With a rating average of 3.73, there were more responses indicating disagreement than strong disagreement to the question of information and knowledge having the same meaning among part-time faculty respondents. Administrative staff also indicated a majority of them strongly disagreeing, with a rating average of 4.25. A rating average of 4.00 among full-time non-administrative staff indicates that their responses contained a majority of respondents only disagreeing rather than strongly disagreeing. The respondent from the part-time non-administrative category strongly disagreed, hence the rating average of 5.00.

Figure 11: Knowledge and information mean the same thing (rating averages)



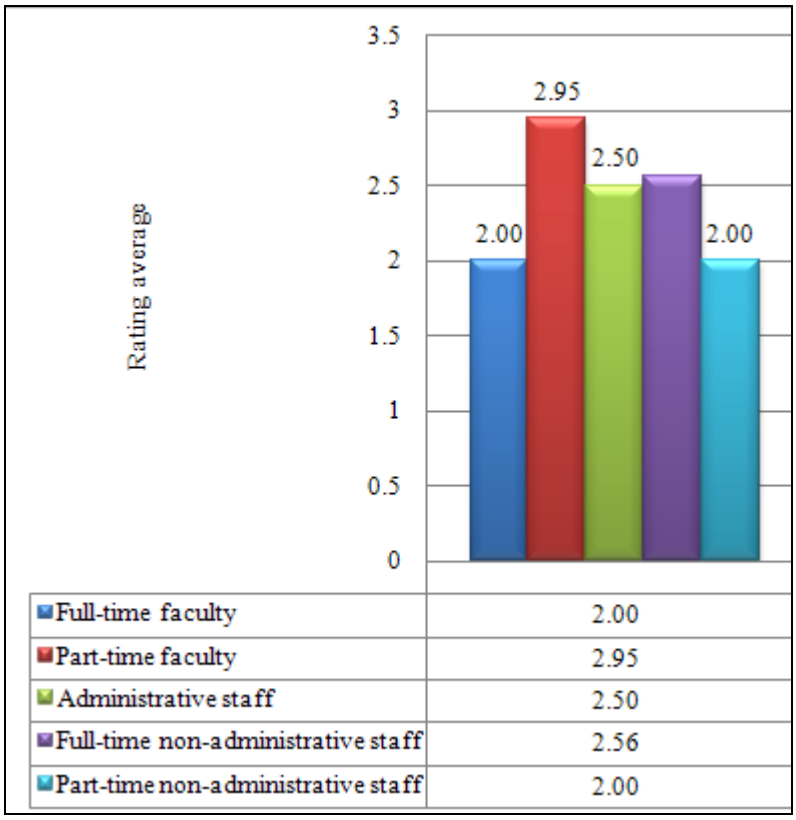
Admittedly, the concept of knowledge was viewed by 20 (49%) of all respondents as difficult to clearly articulate, and 13 (32%) were ambivalent about making a choice concerning this subject, while 8 (19%) disagreed. The perceptions are expressed in Figure 12.

Figure 12: Difficulty in articulating the concept of knowledge



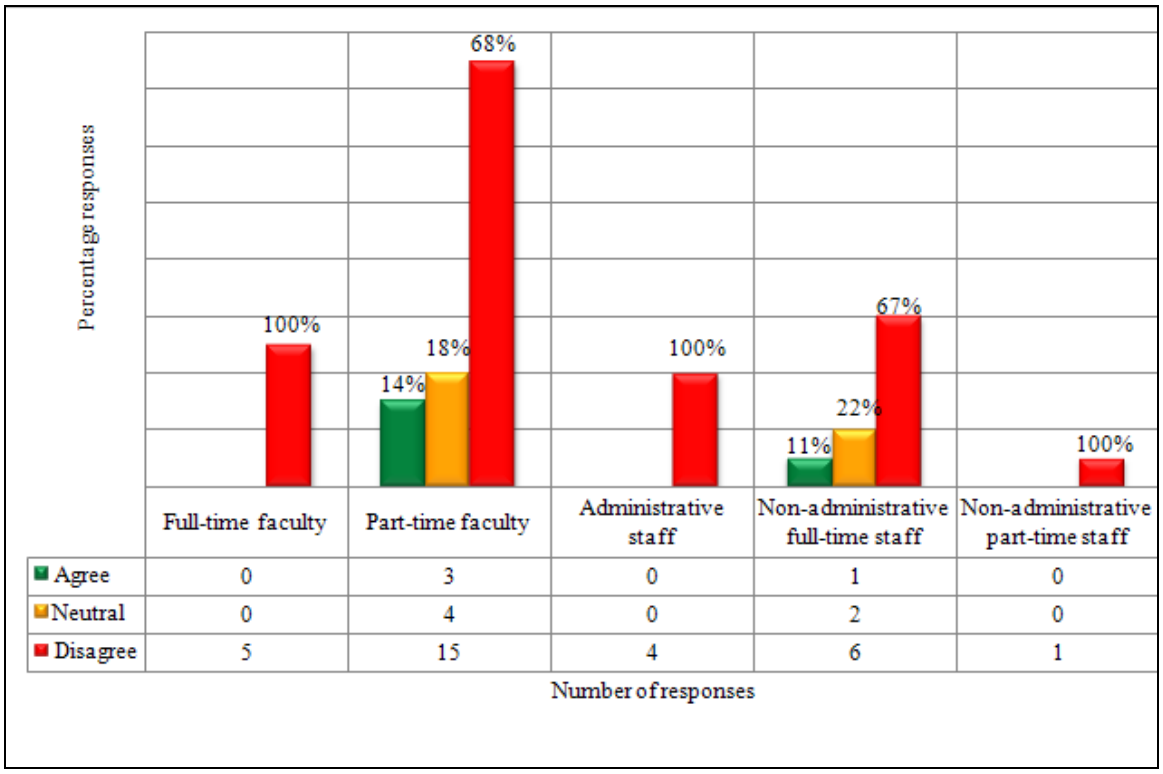
The rating average of 2.00 indicates that in terms of perceptions about articulating the concept of knowledge among full-time faculty, there was a larger number who agreed than strongly agreed. The largest number of respondents among part-time faculty did not give an opinion, hence the rating average of 2.95, that is, almost in the middle of the 1.00-5.00 range. A rating average of 2.50 from the administrative sample reflects an equal distribution between those who agreed and those who gave no opinion. From the full-time non-administrative group, the rating average of 2.56 is indicative of their responses being mostly in the affirmative category. So too is the rating average of 2.00 for the single part-time non-administrative respondent. These rating averages are demonstrated in Figure 13.

Figure 13: Difficulty in articulating the concept of knowledge (rating averages)



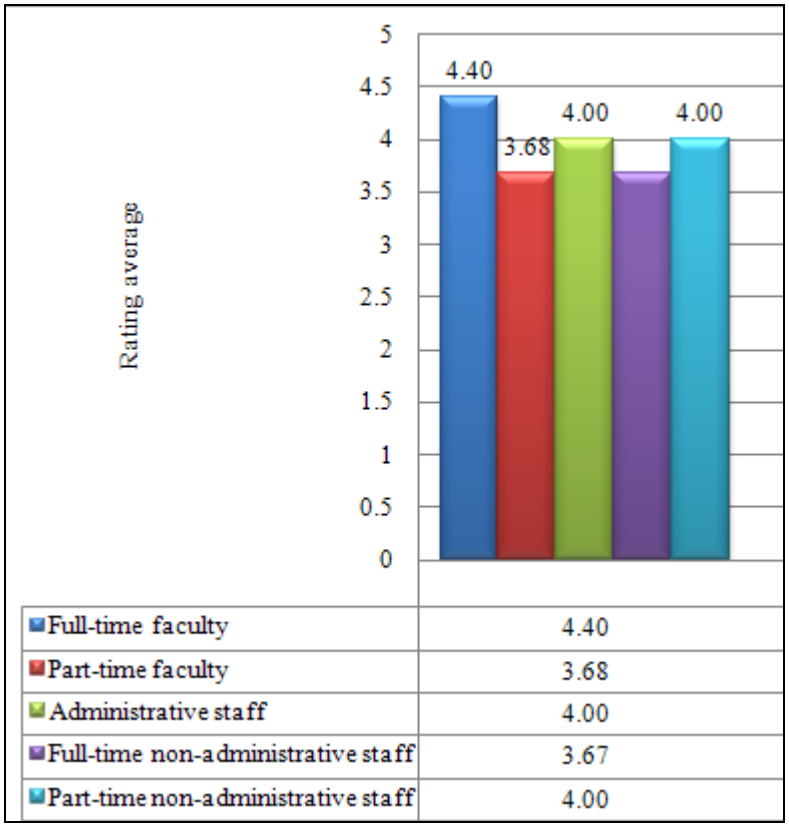
From all the respondents, 31(76%) disagreed with the notion that knowledge management is the same as information management. Only 4 (10%) agreed that they are the same, while 6 (14%) gave an ambivalent response. By using the data to depict the responses by category of staff, there was the indication that all 4 (100%) administrative and 5 (100%) full-time faculty were positive that KM and information management are not the same. Among all the respondents, 15 (68%) part-time faculty disagreed that they mean the same thing, while 4 (18%) did not commit to an opinion, and 3 (14%) agreed with that perception. Among the non-administrative full-time staff, 6 (67%) perceived KM and information management as different, while 2 (22%) were not sure, and 1 (11%) perceived them to be the same. This is demonstrated in Figure 14.

Figure 14: Knowledge management is the same as information management



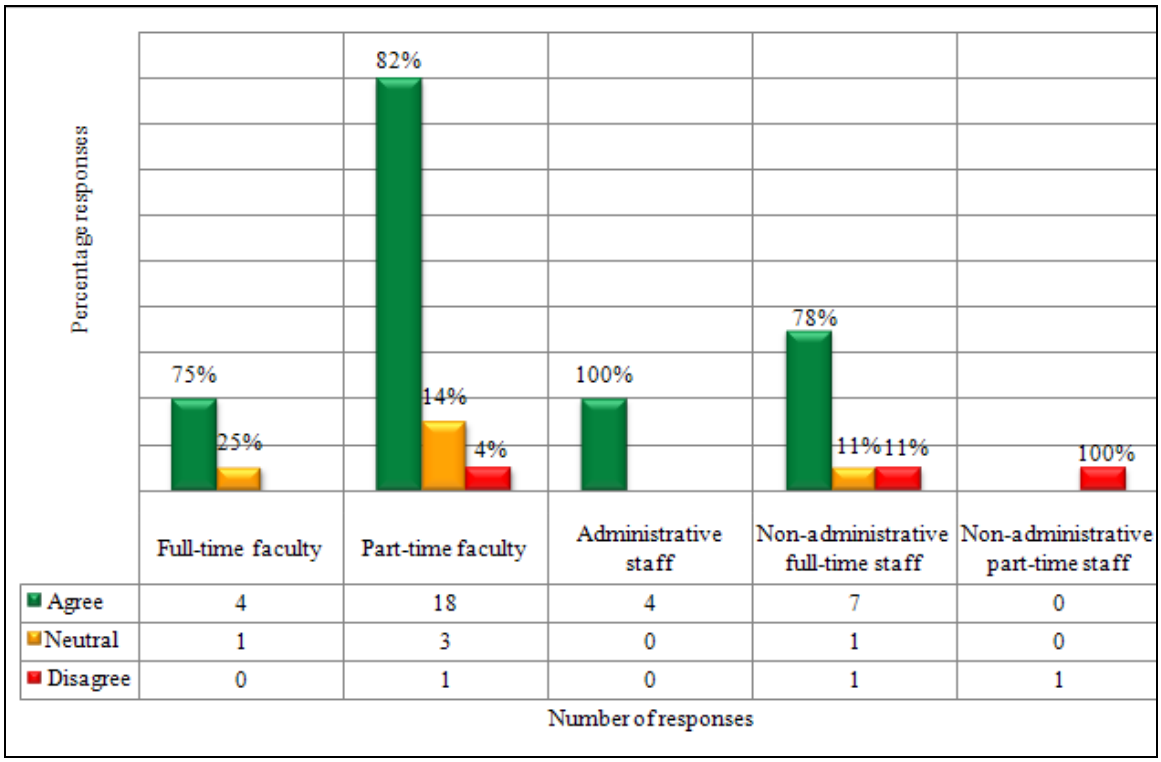
Among the respondents, full-time faculty revealed a rating average of 4.40, indicating that some disagreed, but with others strongly disagreeing. The part-time faculty rating average of 3.68 indicates that there was a substantial number of respondents who were not sure about agreeing or disagreeing with the perception that KM and information management mean the same thing, hence the neutral position even when their majority strongly disagreed. A 4.00 rating average position for administrative staff indicates that all of them opted for the same position of disagreeing with the perception. A rating average position of 3.67 from full-time non-administrative staff indicates that there was a majority who disagreed that KM and information management have the same meaning; and a rating average of 4.00 for part-time non-administrative staff signifies that this category disagreed. This is demonstrated in Figure 15.

Figure 15: Knowledge management is the same as information management (rating averages)



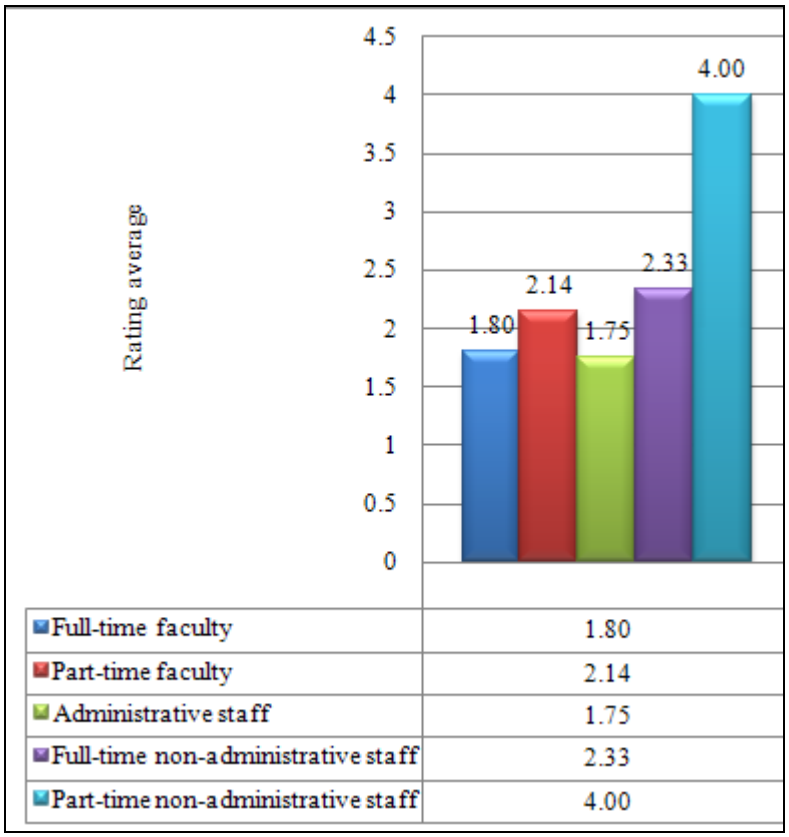
Among the questionnaire respondents, all 4 (100%) administrative staff agreed that KM includes information management, while non-administrative part-time staff disagreed. Among the respondents, 1 (25%) full-time faculty respondent did not give an opinion, while 4 (75%) from the same category agreed. Among the part-time faculty, 3 (14%) respondents were ambivalent about KM including information management while 1 (11%) disagreed, and 18 (82%) agreed with that perception. Among non-administrative full-time staff, 7 (78%) agreed with that perception while 1(11%) each disagreed or opted to use the non-committal choice. These perceptions are demonstrated in Figure 16.

Figure 16: Knowledge management includes information management



A rating average of 1.80 that was reflected by full-time faculty responses suggests that the respondents were either agreeing or strongly agreeing. In the case of part-time faculty, a rating average of 2.14 suggests that their majority chose to agree. In the administrative category, a rating average of 1.75 indicates that the majority in their group strongly agreed that KM includes information management. Getting a rating average of 2.33 from full-time non-administrative category reflects that most individuals in their group also agreed with that perception. The part-time non-administrative category showed a rating average of 4.00, indicating that the choice in this case was to disagree. These positions are reflected in Figure 17.

Figure 17: Knowledge management includes information management (rating averages)



In all instances, the large percentage of part-time faculty that appeared in each case was due to their larger proportional representation in comparison to the rest of the staff categories.

4.2.3 Knowledge retention

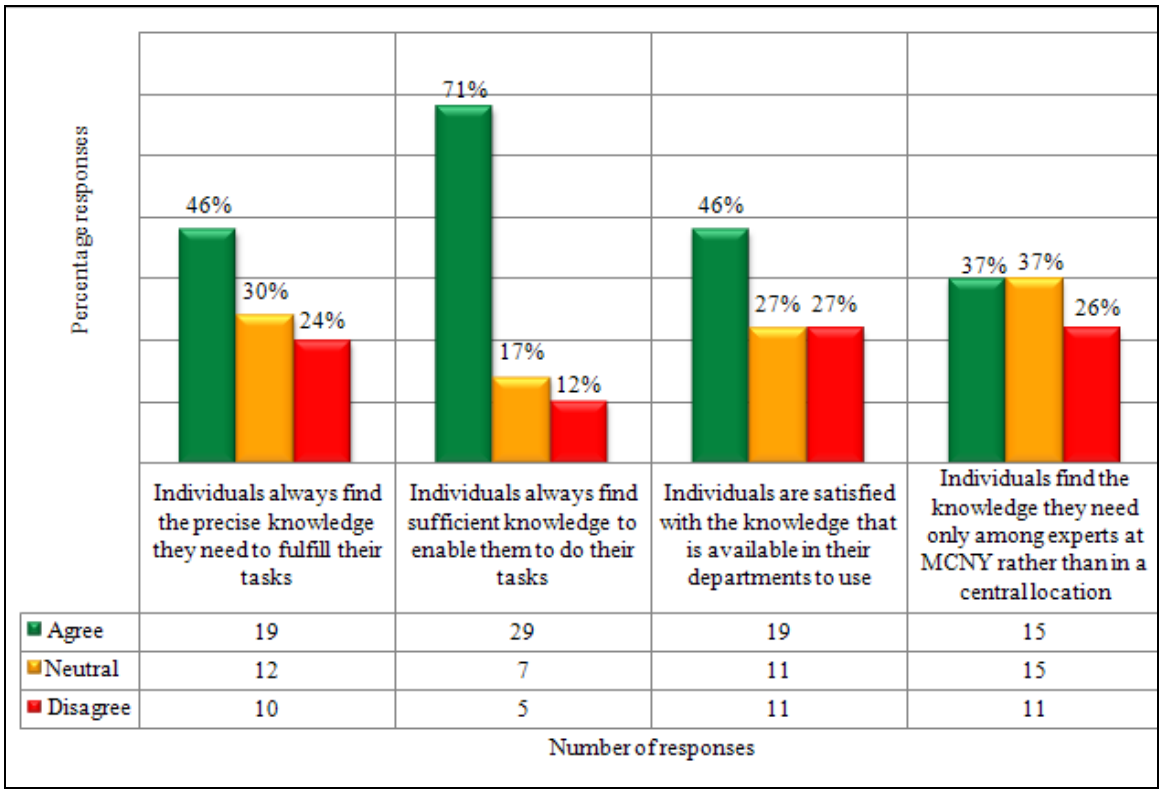
Knowledge retention practices at MCNY were deemed to be dependent on the existence of an environment for sharing knowledge. This point was in line with the suggestions of Lee (2005) and Lloria (2008) that sharing facilitates KM practice. It was based on the fact that a need to share knowledge and a realization of existing knowledge gaps was likely to drive policies for knowledge retention. The question of capturing knowledge before it left

the College would therefore be a priority. In that case practices that were supportive of that perspective would have to be in place.

4.2.3.1 Knowledge retention practices at MCNY

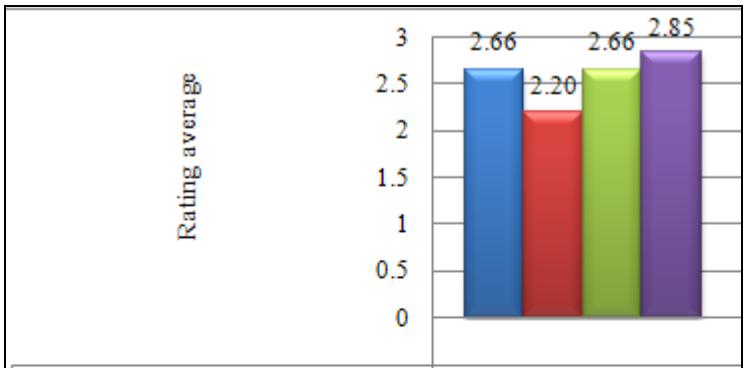
Policy that is aimed at creating an inventory of organizational intellectual assets, and avoiding their loss can be a part of best practices in an organization. These assets include both tacit and explicit knowledge (McAdam and McCreedy, 1999; Nonaka and Takeuchi, 1995; Nonaka and Teece, 2001; Nonaka, Toyama and Konno, 2000; Takeuchi, 2001). At MCNY, such knowledge existed in procedures manuals and job descriptions. This was supported by 29 (71%) respondents who felt that they always found sufficient knowledge to enable them to do their tasks, while 7 (17%) respondents opted not to give an opinion, and 5 (12%) disagreed. At the same time, 19 (46%) found the precise knowledge they needed to fulfil their tasks, while 12 (30%) did not have an opinion, and 10 (24%) disagreed. Another 19 (46%) were satisfied with the knowledge that was available in their departments for their use while 11 (27%) disagreed and 11 (27%) remained ambivalent. Some individuals felt that the knowledge they needed was found only among experts at MCNY rather than in a central location as evidenced by 15 (37%) who agreed, while 15 (37%) chose not to give an opinion, and 11 (26%) disagreed. These results are demonstrated in Figure 18.

Figure 18: Sources of knowledge for individuals at MCNY



While rating averages of 2.66, 2.20, and 2.66 signify that most respondents agreed with the perceptions they were presented with, 2.85 signifies that most of the respondents, to the perception on individuals finding the knowledge they needed only among experts rather than in a centralized location, agreed, but also with a large percentage of them opting not to give an opinion. This is reflected in Figure 19.

Figure 19: Sources of knowledge for individuals at MCNY (rating averages)



Individuals always find the precise knowledge they need to fulfill their tasks	2.66
Individuals always find sufficient knowledge to enable them to do their tasks	2.20
Individuals are satisfied with the knowledge that is available in their departments to use	2.66
Individuals find the knowledge they need only among experts at MCNY rather than in a centralized location	2.85

With knowledge retention, there is need for a best practices database that acts like a central place from where each individual gets required knowledge (Sarrafzadeh, Martin and Hazeri, 2010: 199).

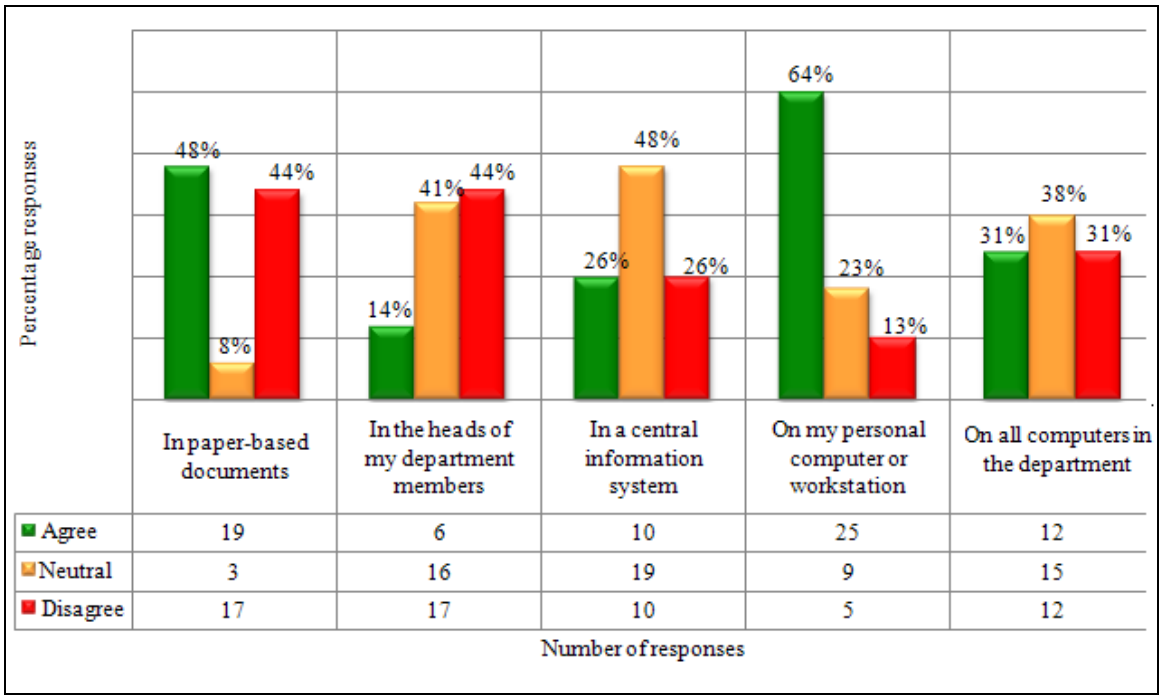
4.2.3.2 Best practices database for knowledge retention

At MCNY, there appeared to be several places that one could access knowledge from, but not necessarily in a central place. This ranged from paper based sources, the heads of individuals in the departments, a central information system, individual personal computers, and departmental computers. While 19 (48%) agreed that knowledge was found in paper-based documents, 3 (8%) did not commit to an opinion, and 17 (44%) did not agree. Among the respondents, 17 (44%) disagreed that knowledge was in the heads of departmental members, while 16 (41%) were ambivalent about that perception, and 6 (14%) agreed with it. However, 25 (64%) were of the perception that the knowledge they

needed to perform their job functions was on their personal computers or workstations while 9 (23%) opted not to give an opinion and 5 (13%) disagreed.

A significant number of 19 (48%) did not give an opinion about knowledge being kept in a central storage space although 10 (26%) agreed and another 10 (26%) disagreed with that perception. At the same time, 12 (31%) agreed, while 12 (31%) disagreed that knowledge storage was done on all computers in the departments they worked in, and 15 (38%) gave no opinion. A non-committal response seemed the most popular concerning the availability of knowledge in a central information system as indicated by 19 (48%) not committing themselves to an opinion, while 10 (26%) agreed and 10 (26%) disagreed. The results are demonstrated in Figure 20.

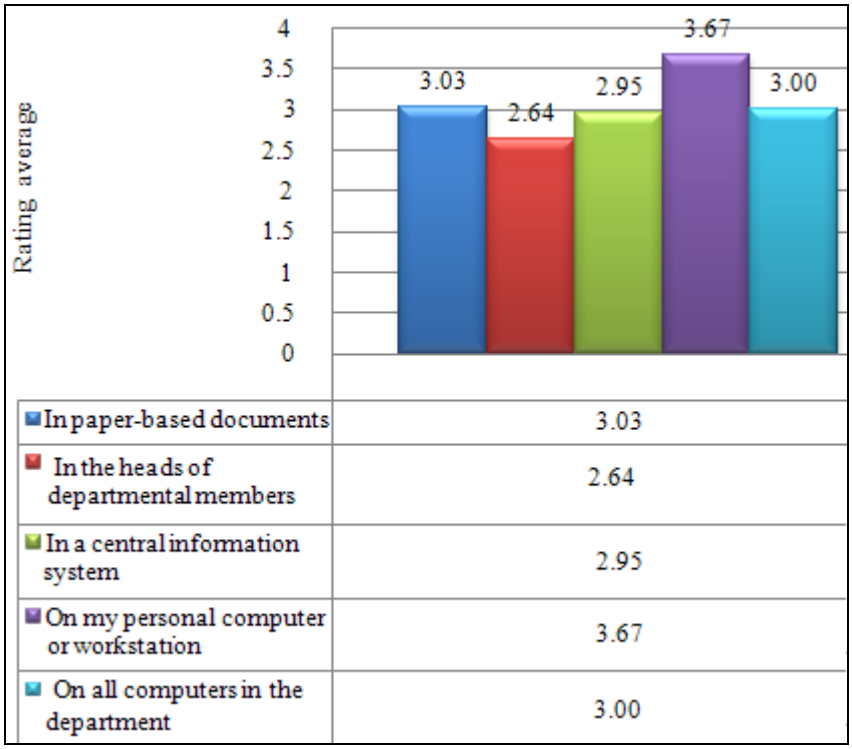
Figure 20: Places where knowledge was stored



The rating average of 3.03 to knowledge being stored in paper-based documents signifies that a large number of respondents agreed with that perception, although there was also a substantial number disagreeing. A rating average of 2.64 signifies that comparable

numbers either chose to disagree or remain non-committal to the suggestion that knowledge was in the heads of colleagues. With a rating average of 2.95, a large number of respondents chose a non-committal response and about the existence of a central information system although there were some respondents who either agreed or disagreed. A rating average of 3.67 signifies that a large number of respondents agreed with the suggestion that knowledge was on personal computers; while a rating average of 3.00 signifies that the majority of the respondents gave no opinion concerning the suggestion that knowledge existed on all computers in the department. This is demonstrated in Figure 21.

Figure 21: Places where knowledge was stored (rating averages)

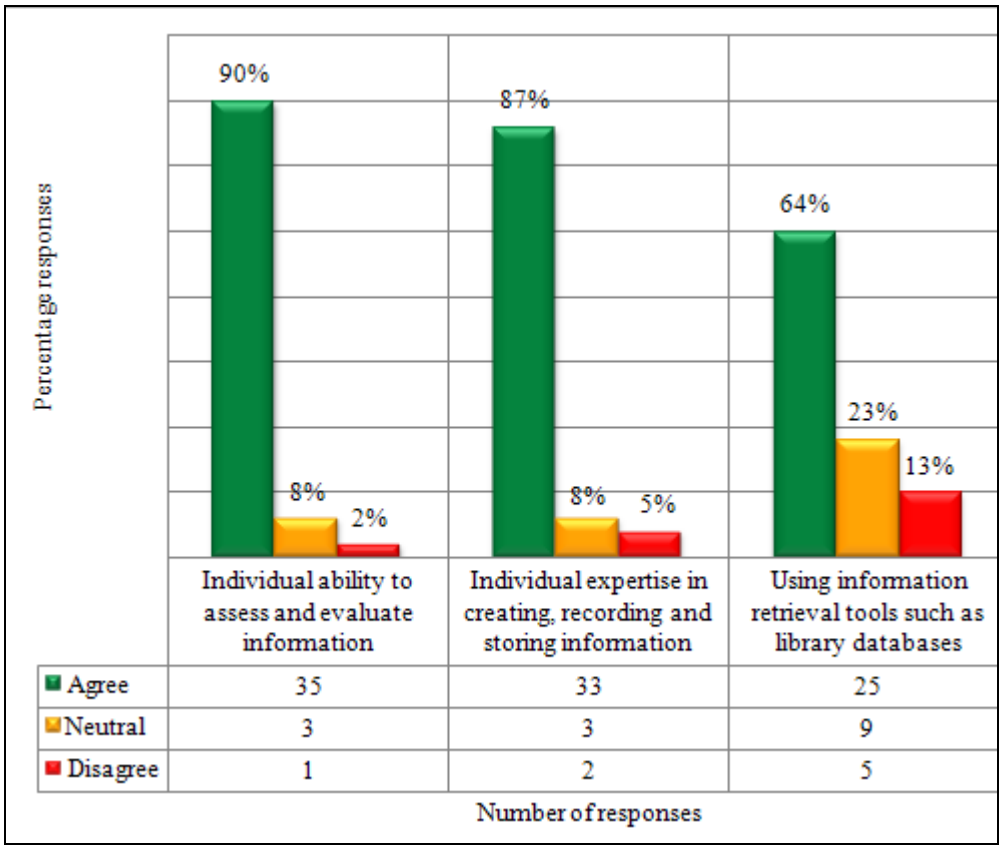


Knowledge needs were mainly for supporting the education and teaching goals at MCNY and they varied with the different roles of individuals in the College. The main knowledge needs were realized from the experiences that people went through, as well as the results from the current and past semesters, along with specific knowledge that was

dependent on research information availability and retrieval methods. In other words, this was the use of organizational memory (OM) because "in the process of practice, every organization develops OM, thus guiding present activities" (Zhang, Tian and Qi, 2006: 227). But then, OM falls under the wider discipline of KM where the latter is involved with the capture, cataloguing, preservation, and dissemination of the expertise and knowledge that are part of the memory of an organization (Zhang, Tian and Qi, 2006).

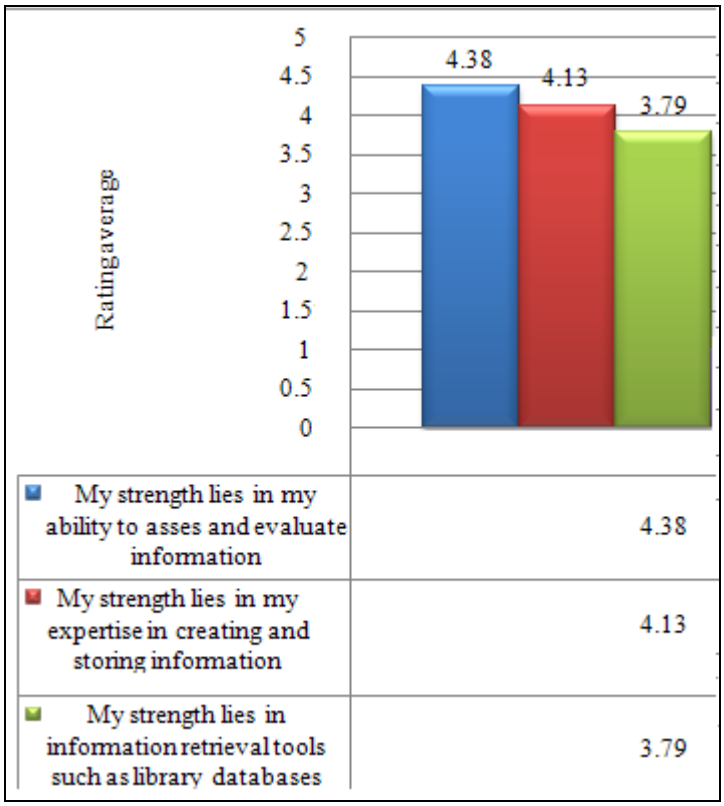
Technology that includes an online environment and personnel to manage it was suggested in literature as an enabler in KM practice (Abell, 2000; Jain, 2007; Lloria, 2008; Singh, 2007). This meant that a certain degree of knowledge handling expertise was required in order to be competent in this environment. Figure 22 shows that 35 (90%) of the questionnaire respondents were confident that they were able to assess and evaluate information, while 3 (8%) gave no opinion, and 1 (2%) disagreed with that perception. Another 33 (87%) respondents were confident that they were capable of creating, recording and storing information, while 3 (8%) were ambivalent, and 2(5%) disagreed. They also indicated that they were able to use information retrieval tools such as library databases as evidenced by 25 (64%) who agreed that they could, while 9 (23%) gave no opinion, and 5 (13%) disagreed.

Figure 22: Knowledge handling expertise useful in a knowledge management environment



In the instance where a rating average of five represents strong agreement, a rating average of 4.38 to individual strength being found in respondents' ability to assess and evaluate information indicates that respondents strongly agreed with that perception. A similar pattern of strongly agreeing, with a rating average of 4.13, was reflected in the responses to individual strength being in their expertise in creating, recording and storing information. A rating average of 3.79 reflects that more respondents agreed with the suggestion that individual strength was in their ability to use information retrieval tools such as library databases, than those who strongly agreed. This is demonstrated in Figure 23.

Figure 23: Knowledge handling expertise useful in a knowledge management environment (rating averages)



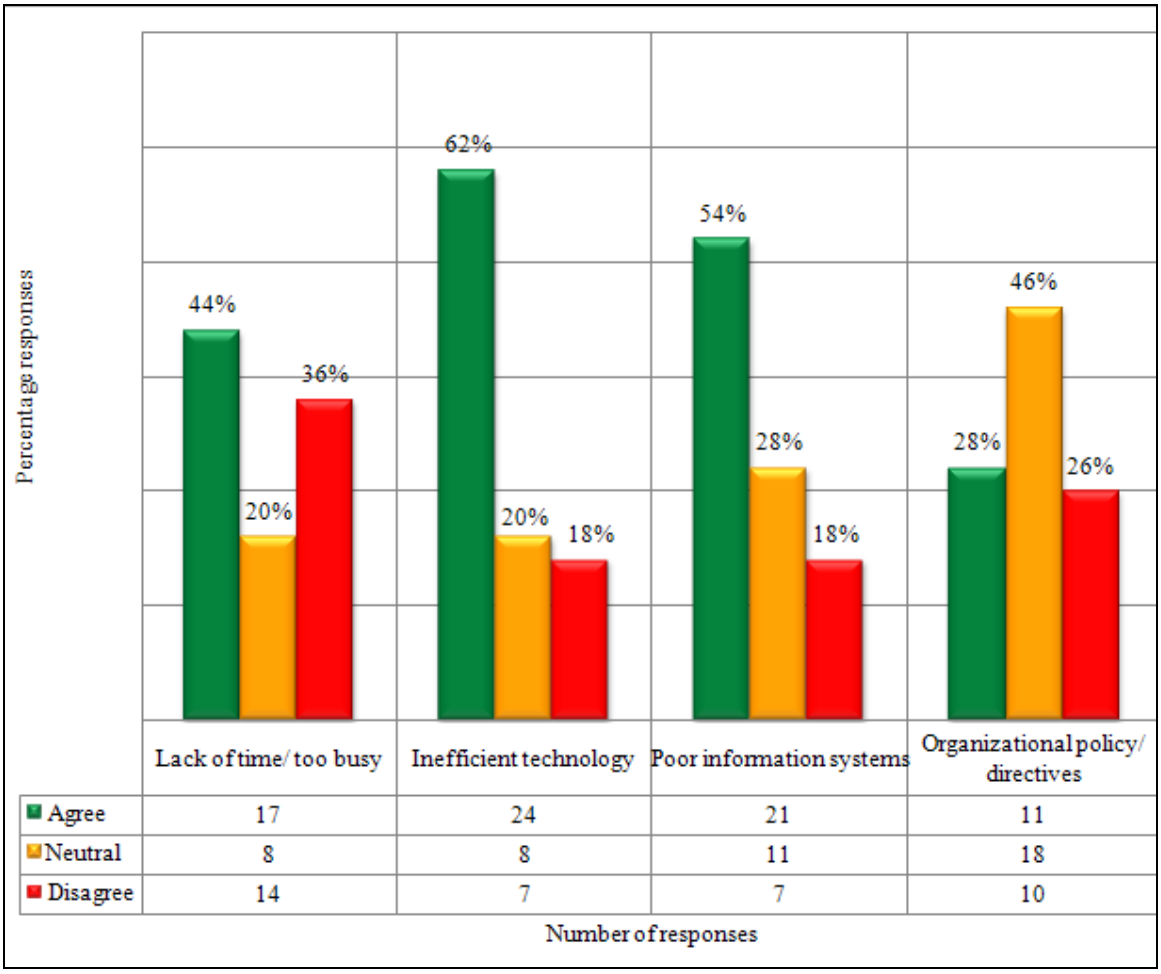
Having access to information and knowledge was important but it had to be properly stored to be of value. It was therefore necessary to consider any barriers to its storage.

4.2.3.3 Barriers to knowledge storage

The lack of time was seen as a barrier to being able to store information effectively and efficiently as reflected by 17 (44%) agreeing that they were too busy to do it, 8 (20%) giving no opinion, and 14 (36%) disagreeing. Another 24 (62%) agreed that the College's technology was inefficient, while 8 (20%) were ambivalent about that, and 7 (18%) disagreed with that view. The question of poor information systems was another reason seen as a barrier, to which 21 (51%) agreed, 11 (28%) gave no opinion, but 7 (18%) disagreed. Organizational policy and/ or directives were another barrier that some

respondents believed prevented them from storing information effectively as evidenced by 11 (28%) who agreed, even while 18 (46%) opted not to give an opinion, and 11 (28%) disagreed. These perceptions are demonstrated in Figure 24.

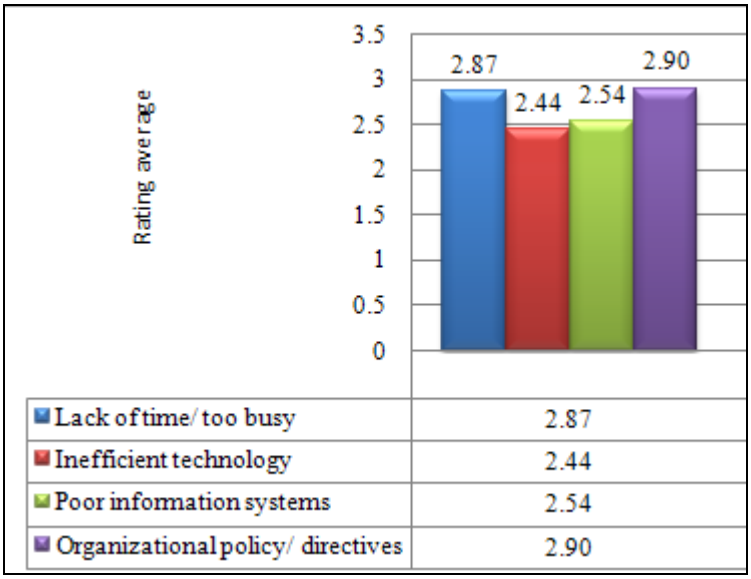
Figure 24: Barriers to storing information received more efficiently and effectively



A rating average of 2.87 reflects that most respondents agreed that a lack of time or being too busy was a barrier to efficient information storage, but with a large number also disagreeing. With rating averages of 2.44 and 2.54, inefficient technology was perceived as a barrier to information storage, and poor information systems were belived to be a barrier respectively. However, a 2.90 rating average is indicative of the prevalence of a

non-committal position to the suggestion that organizational policy or directives were a barrier to knowledge storage. This is reflected in Figure 25.

Figure 25: Barriers to storing information received more efficiently and effectively (rating averages)



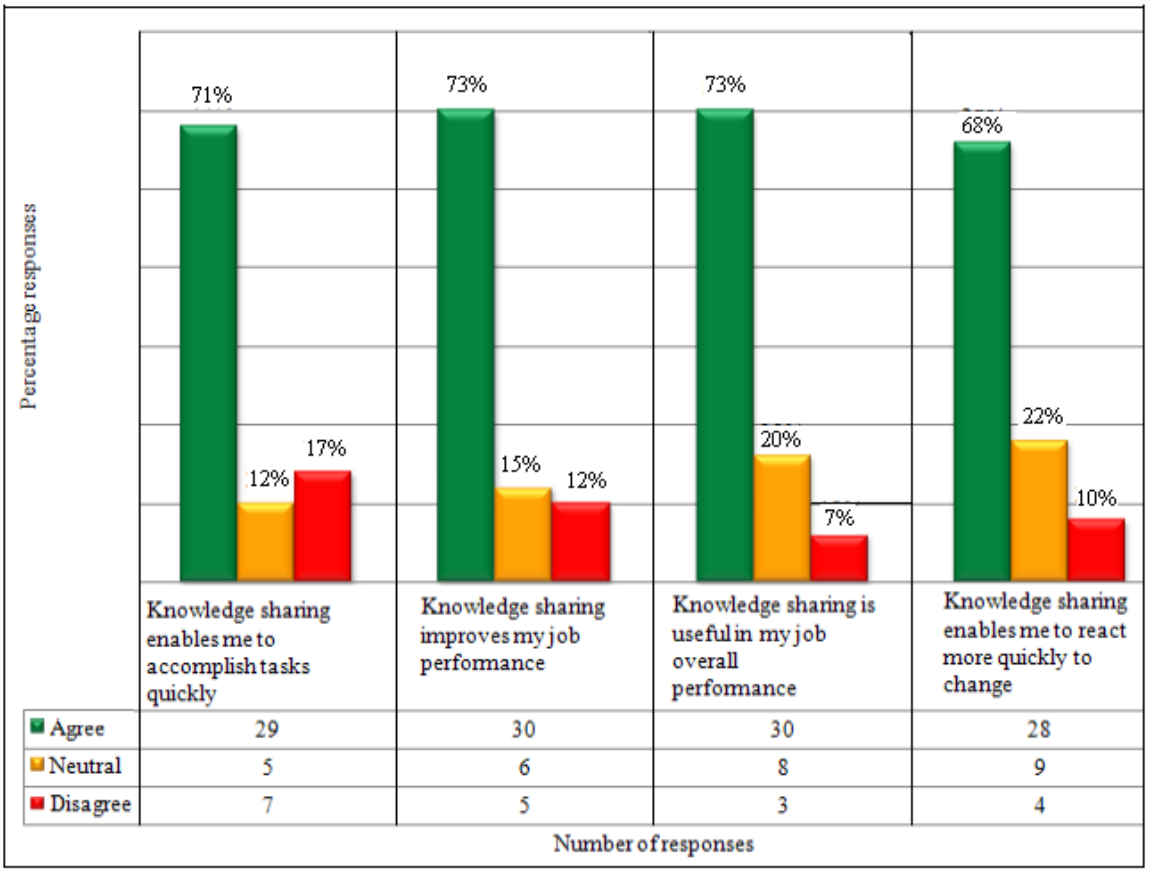
4.2.4 Knowledge transfer and practices at MCNY

With the said barriers in mind, the next question was about the knowledge sharing or transfer culture at MCNY. This question sought to highlight the knowledge gaps of the MCNY community, according to the perceptions of respondents. This included individual views at the departmental level, and then at institutional level. To have an idea of the extent of knowledge sharing, questions were directed at finding out if indeed an environment for so doing existed and what impact individuals felt it had on their departmental effectiveness.

The question of the impact of knowledge sharing on individuals revealed that respondents felt that it enabled their quick accomplishment of tasks as evidenced by 29 (71%) who agreed, while 5 (12%) gave no opinion, and 7 (17%) disagreed. They also felt that it

improved their job performance as highlighted by 30 (73%) who agreed, while 6 (15%) gave a non-committal response, and 5 (12%) disagreed. Among the respondents, 30 (73%) agreed that it was generally useful in their jobs, while 8 (20%) were ambivalent, and 3 (7%) disagreed with that perception. Responses indicated that knowledge sharing enabled individuals to react more quickly to change as reflected by 28 (68%) who agreed, while 9 (22%) gave no opinion, but 4 (10%) disagreed. These results are depicted in Figure 26

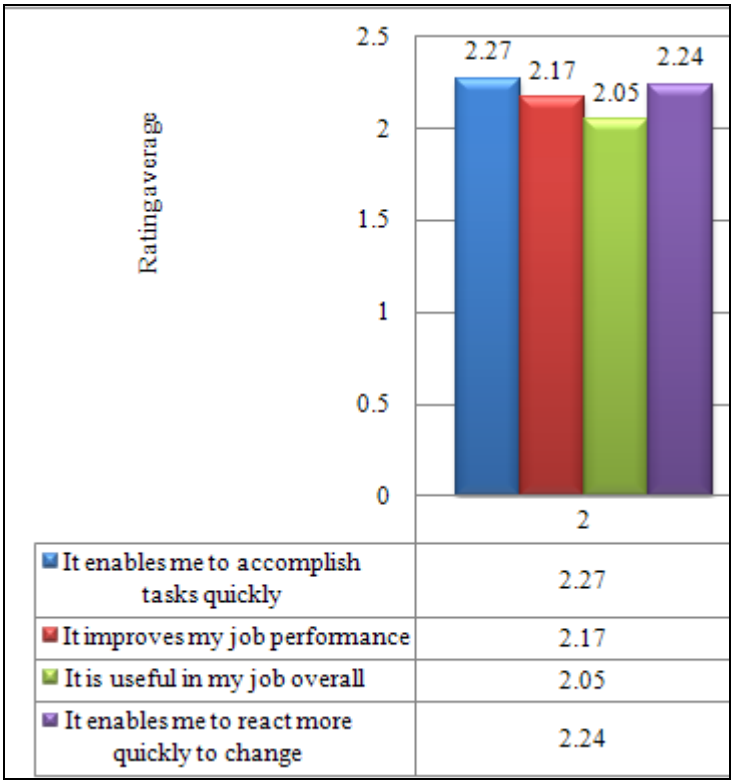
Figure 26: Environment for sharing of knowledge and the individual in a department



Rating averages of 2.27 and 2.17 reflect that most questionnaire respondents agreed that the environment for sharing knowledge was enabling individuals to accomplish tasks quickly, and that the environment for sharing knowledge improved individual job

performance, respectively. A similar pattern is reflected by rating averages of 2.05 and 2.24 indicating that a large number of respondents agreed that the environment for knowledge sharing was important to people's jobs overall, and that the environment for sharing knowledge enabled individuals to react more quickly when necessary. These rating averages are demonstrated in Figure 27.

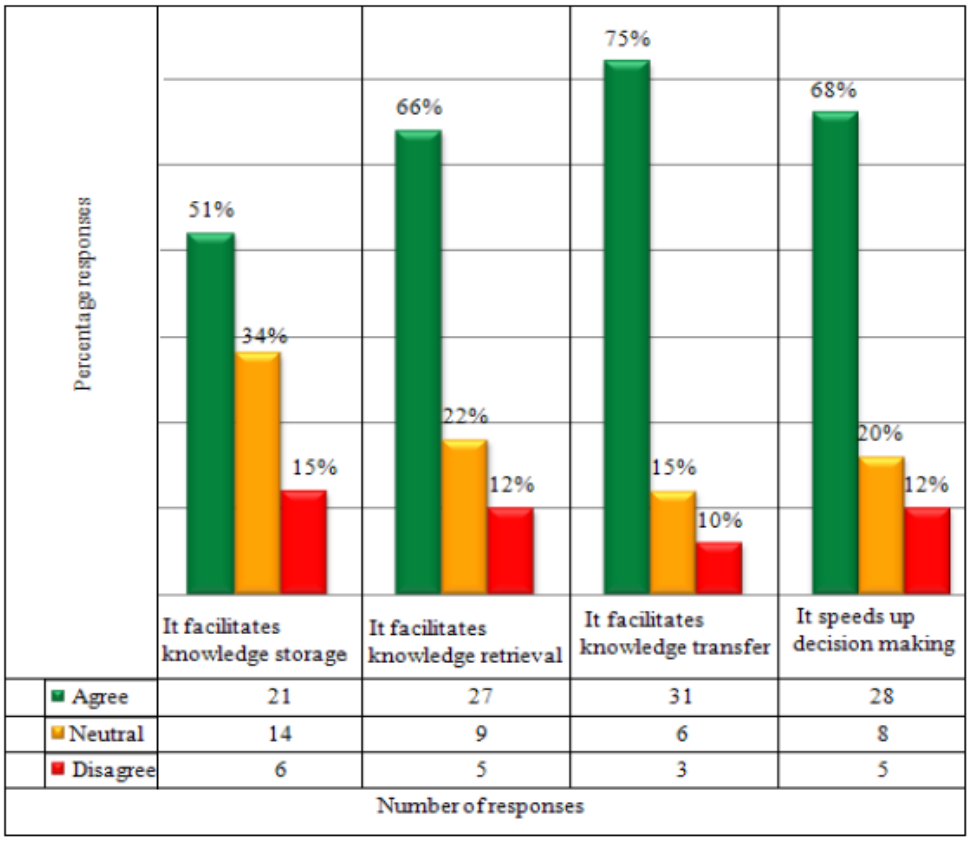
Figure 27: Environment for sharing of knowledge and the individual in a department (rating averages)



Concerning the departmental environment for the sharing of knowledge as facilitating knowledge storage, 21 (51%) respondents agreed, 14 (34%) gave no opinion, and 6 (15%) disagreed; the departmental environment for the sharing of knowledge as facilitating knowledge retrieval had 27 (66%) agreeing, 9 (22%) giving a non-committal response, and 5 (12%) disagreeing; while the departmental environment for the sharing of knowledge as facilitating knowledge transfer had 31 (75%) respondents agreeing, 6 (15%) giving an ambivalent response, and 4 (10%) disagreeing. There was also the

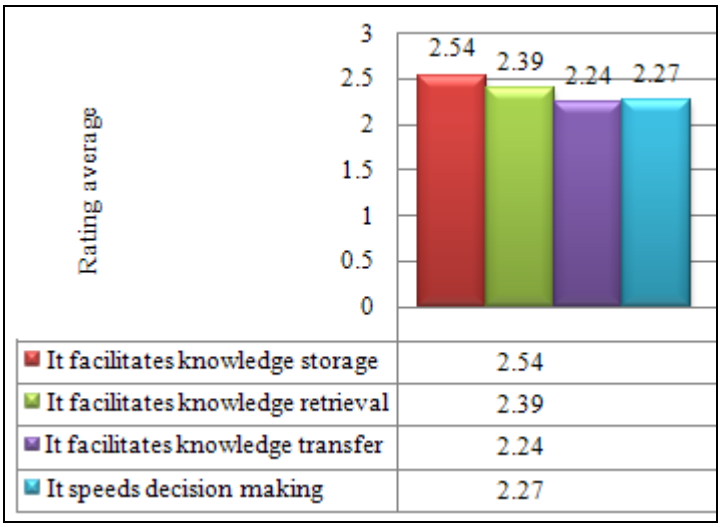
perception that it speeded up decision making as reflected by 28 (68%) respondents agreeing 8 (20%) giving a non-committal response, and 5 (12%) disagreeing. These perceptions towards KM practice are depicted in Figure 28.

Figure 28: Departmental environment for sharing of knowledge and knowledge management



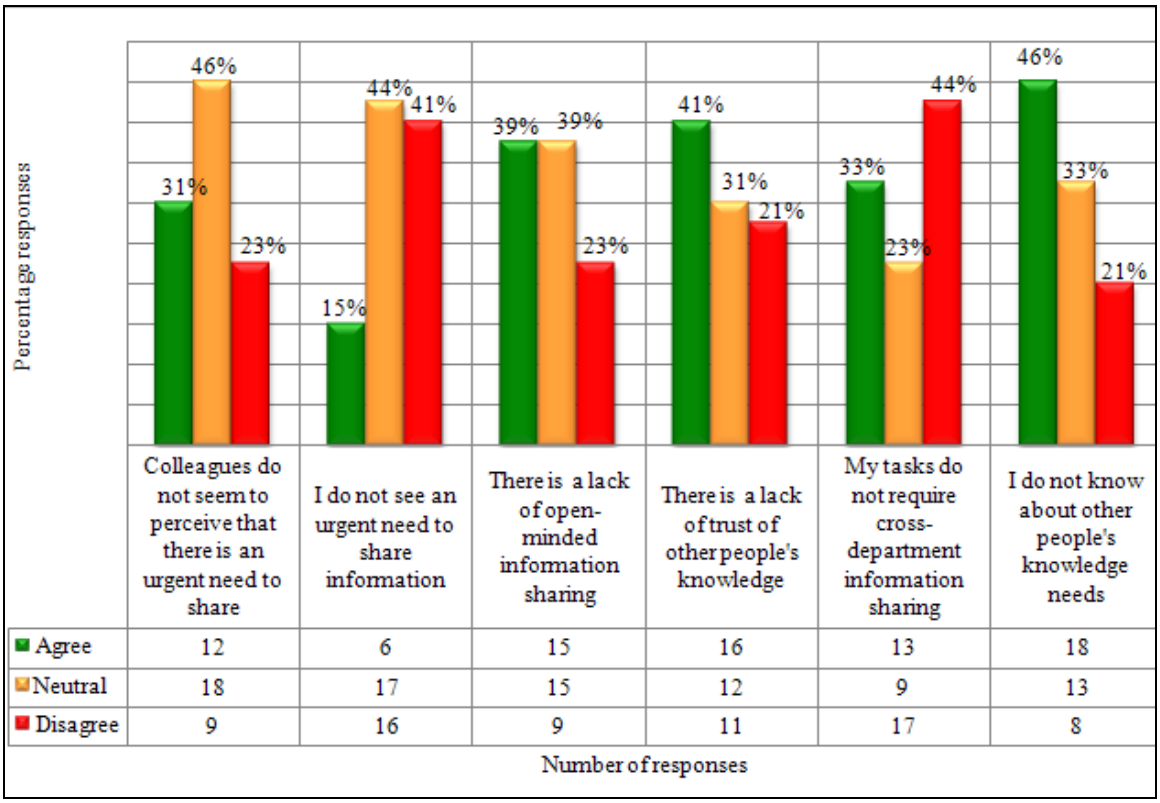
Rating averages of 2.54, 2.39, 2.24, and 2.27 reflect that most respondents agreed that a departmental environment for sharing knowledge facilitates knowledge storage, retrieval, transfer, and speeds up decision making respectively. These rating averages are demonstrated in Figure 29.

Figure 29: Departmental environment for sharing of knowledge and knowledge management (rating averages)



In responding to the question regarding the challenges individuals faced in sharing information with people from other departments within the College, 18 (46%) respondents gave no opinion about colleagues' failure to perceive that there was an urgent need to share, but 12 (31%) agreed, while 9 (23%) disagreed with that perception; 17(44%) of them opted to use a non-committal response relating to their own failure to realize an urgent need to share information, and 6 (15%) agreed, but 16 (41%) disagreed with that view. Among the respondents, 15 (39%) gave no opinion about the fact that there was a lack of an open-minded sharing environment at MCNY, and 15 (39%) of them agreed, but 9 (23%) disagreed. There were 12 (31%) respondents who gave no opinion about the existence of a lack of trust of other people's knowledge, while 16 (41%) agreed with that perception, but 11 (21%) disagreed. Another challenge faced was due to a lack of awareness of colleagues' knowledge needs as reflected by 18(46%) respondents agreeing, with 13 (33%) opting not to give an opinion, but 8(21%) disagreed. Some respondents felt that their tasks did not require cross-departmental information sharing as confirmed by 13 (33%) who agreed, but 17 (44%) disagreed with that perception, while 9 (23%) gave no opinion. These results are demonstrated in Figure 30.

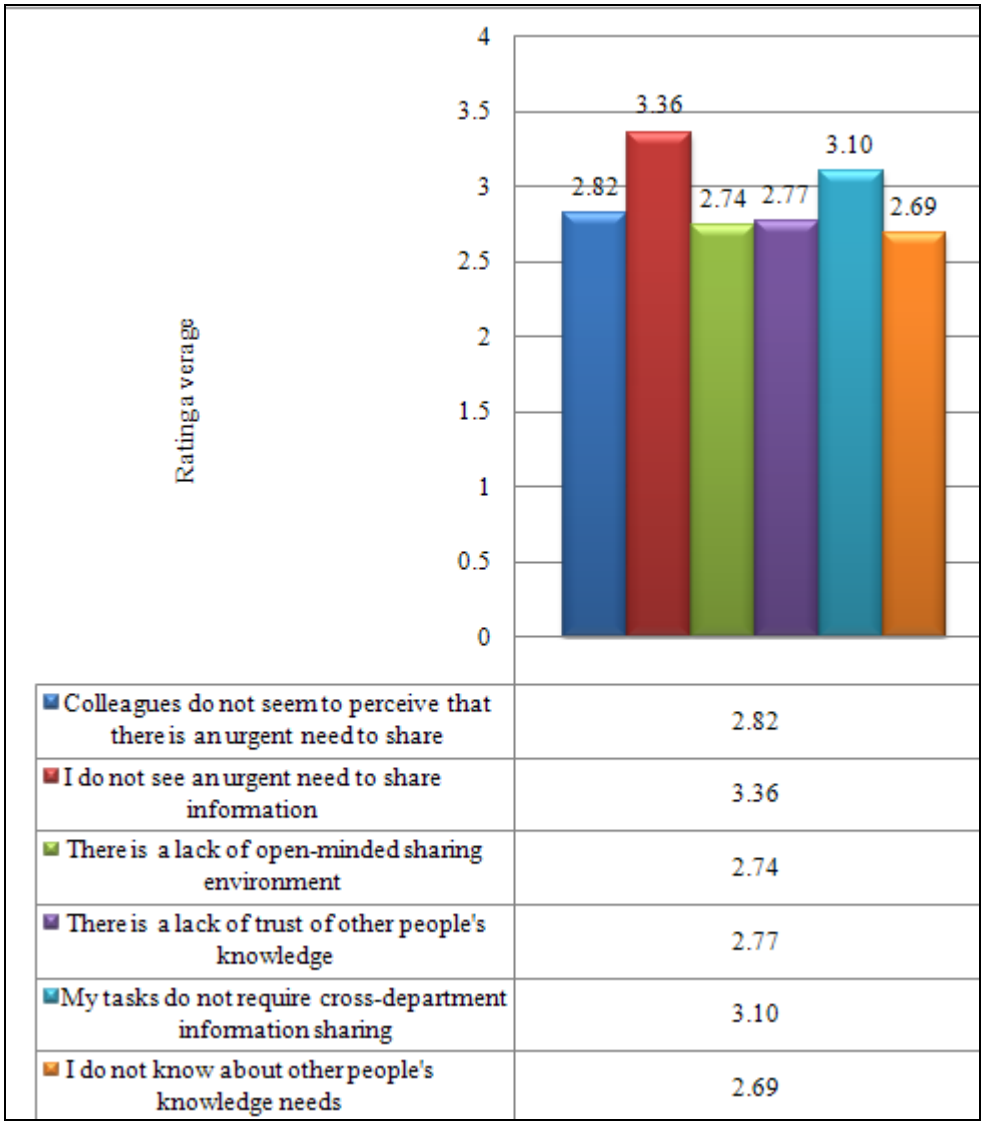
Figure 30: Individual challenges faced in sharing information with people from other departments within the College



A rating average 3.36 reflects that the majority of respondents chose not to give an opinion on whether they saw an urgent need to share information, and a large number of them disagreed. In terms of respondents' perception about their colleagues' realization of the urgent need to share information 2.82 reflects that most respondents were ambivalent but some of them gave an affirmative response. There was a tendency towards agreeing that there was a lack of an open-minded sharing environment and a lack of trust of other people's knowledge, as reflected by rating averages of 2.74 and 2.77, even if substantial numbers of them gave no opinion about the perceptions. In relation to the perception that their tasks did not require cross-department information sharing, the rating average of 3.10 reflects more disagreement than ambivalence, and a large number agreeing. A rating average of 2.69 shows that many respondents agreed, but with a substantial number of

them also using the ambivalent choice of response concerning a lack of knowledge of colleagues' knowledge needs. This is demonstrated in Figure 31.

Figure 31: Individual challenges faced in sharing information with people from other departments within the College (rating averages)

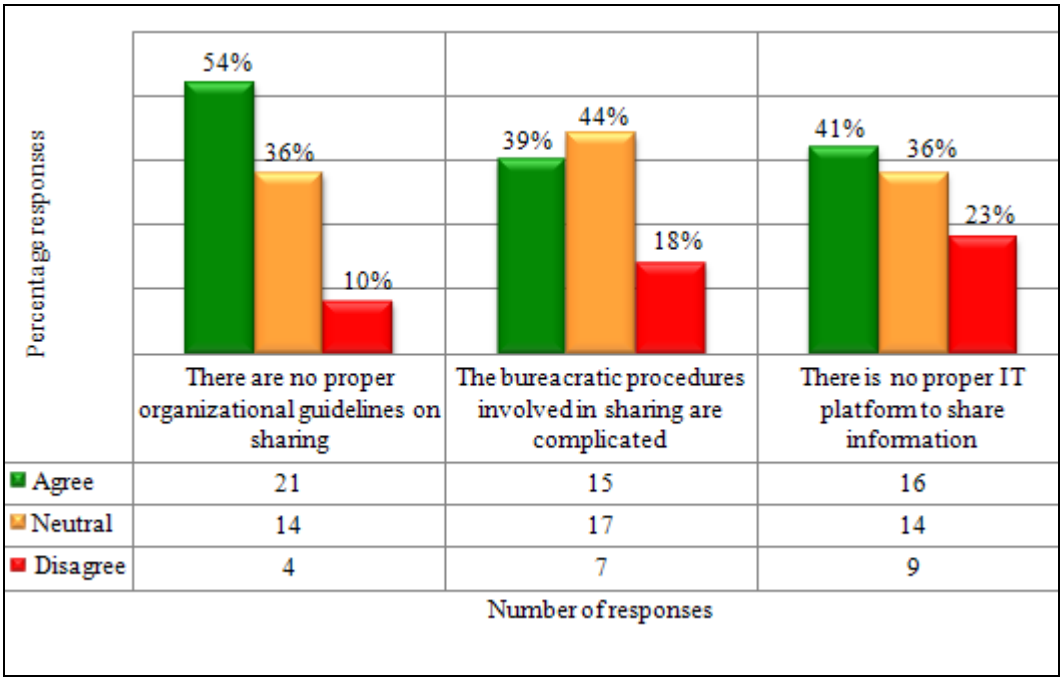


Colleagues do not seem to perceive that there is an urgent need to share	2.82
I do not see an urgent need to share information	3.36
There is a lack of open-minded sharing environment	2.74
There is a lack of trust of other people's knowledge	2.77
My tasks do not require cross-department information sharing	3.10
I do not know about other people's knowledge needs	2.69

An above average number of respondents, that is, 21 (54%) felt that there were no proper organizational guidelines on sharing of information at MCNY, while 4 (10%) disagreed with that, but 14 (36%) gave no opinion. The view that the bureaucratic procedures involved in sharing were complicated was expressed by 15 (39%) who agreed, but 17

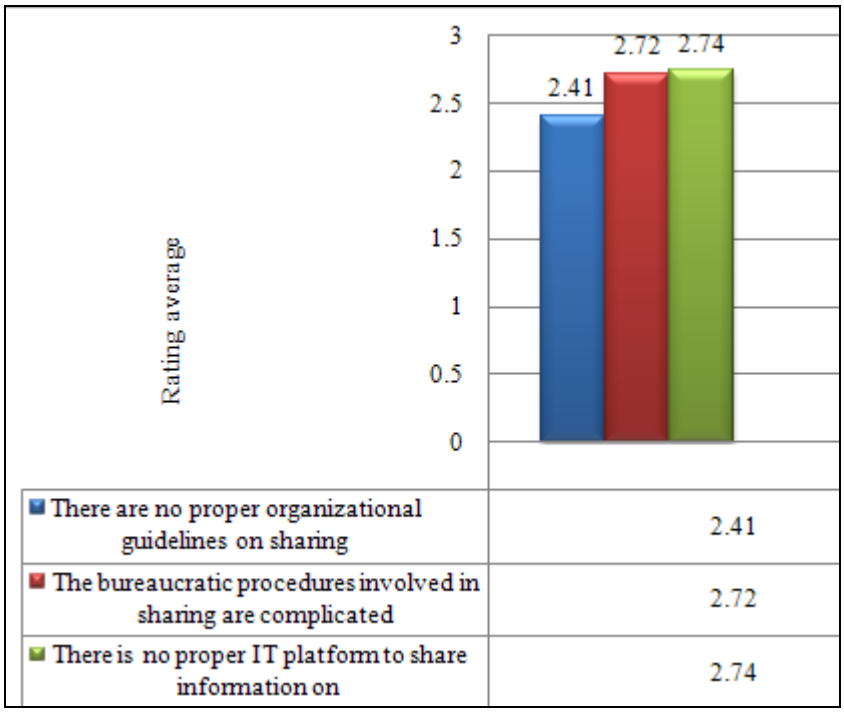
(44%) gave a non-committal response while 7 (18%) disagreed with that perception. The lack of a proper IT platform to share information on was seen by 16 (41%) as a hindrance, while 14 (36%) did not give an opinion, but 9 (23%) disagreed with that notion. These perceptions are expressed in Figure 32.

Figure 32: Departmental challenges faced in sharing information among people from different departments within the College



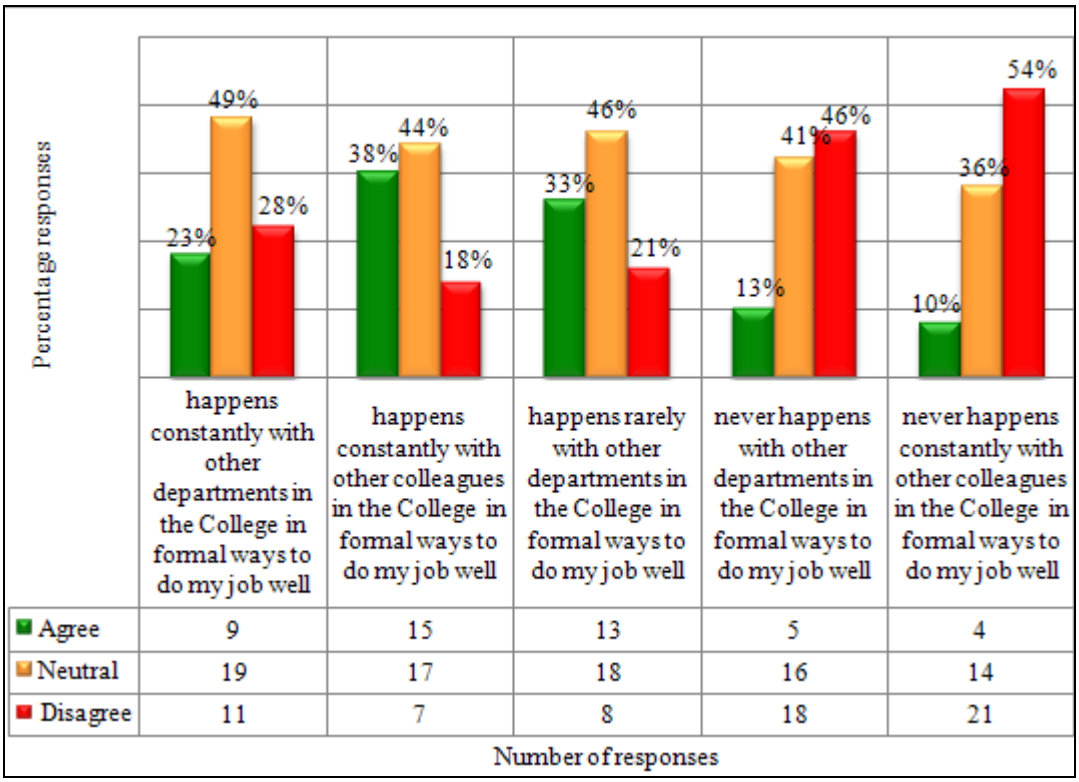
A rating average of 2.41 indicates that the most popularly selected response was to agree with the suggestion that there were no proper organizational guidelines on sharing. Rating averages of 2.72 and 2.74 reveal that while many respondents agreed, some opted not to give an opinion about the bureaucratic procedures involved in sharing being complicated, and also in the question relating to the absence of a proper IT platform to share information on at MCNY. These ratings are reflected in Figure 33.

Figure 33: Departmental challenges faced in sharing information among people from different departments within the College (rating averages)



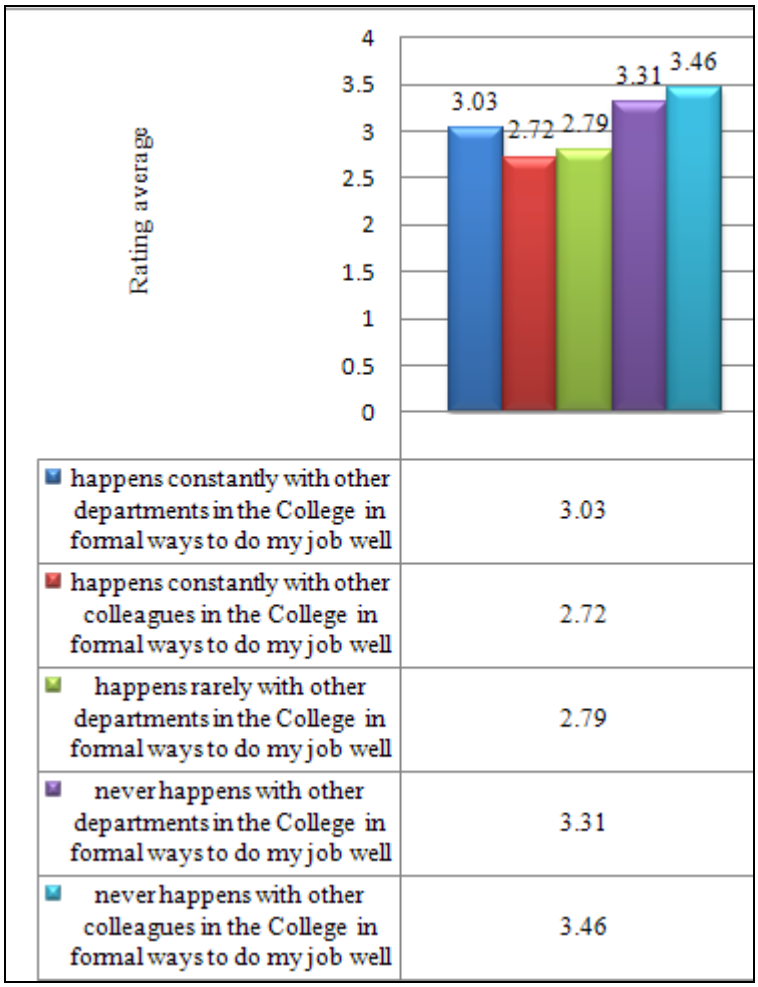
A similar pattern is apparent in Figure 34 where the question of the culture of sharing information at the MCNY level is displayed. For example, 9 (23%) agreed that information sharing happened constantly with other departments in the College in formal ways to do their jobs well, but 19 (49%) did not give an opinion about the same fact, and 11 (28%) disagreed. Another 15 (38%) respondents agreed that information sharing happened constantly with other colleagues in the College in formal ways to do their jobs well, but 17 (44%) opted not to give an opinion, while 7 (18%) disagreed with that perception. In terms of information sharing rarely happening with other departments on the College, 13 (33%) agreed and 18 (46%) did not give an opinion, and 8 (21%) disagreed with that view. Concerning whether information sharing never happened with other departments at MCNY, 18 (46%) respondents disagreed, 16 (41%) gave a non-committal response, while 5 (13%) agreed. To the perception that information sharing never happened at MCNY, 21 (54%) disagreed, 14 (36%) did not give an opinion, 4 (10%) agreed. These perceptions are reflected in Figure 34.

Figure 34: Sharing of information at MCNY



A rating average of 3.03 reflects that most respondents gave no opinion to the perception that sharing information happened constantly with other departments in the College in formal ways. Rating averages of 2.72 and 2.79, to perceptions on information sharing happening constantly with other colleagues in the College in formal ways, as well as on information sharing happening rarely with other departments in the College in formal ways, reflect affirmative responses but with the non-committal option being a choice used by substantial numbers too. A rating average of 3.31 reflects that the option to disagree was selected more than any other to indicate that it was not accurate to suggest that information sharing never happened with other departments in the College in formal ways. A rating average of 3.46 also indicates disagreement, highlighting the inaccuracy of suggesting that information sharing never happened with other colleagues in the College in formal ways. This is demonstrated in Figure 35.

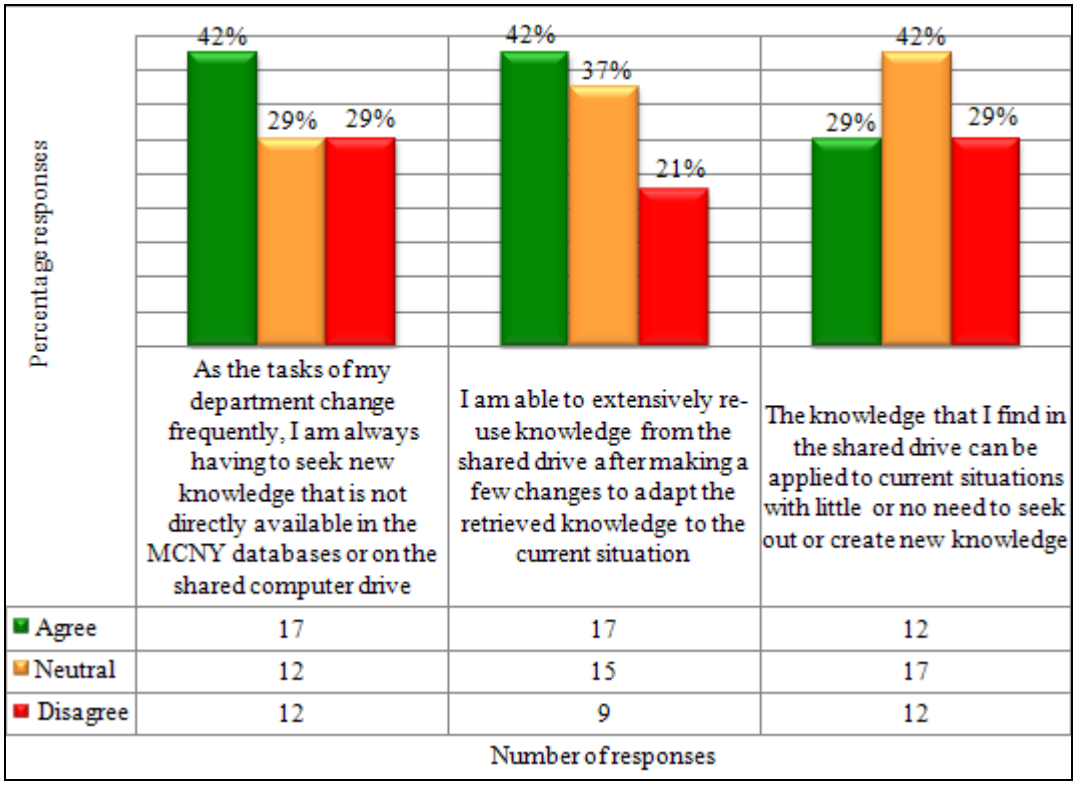
Figure 35: Sharing of information at MCNY (rating averages)



For the successful accomplishment of tasks, employees used various ways to get the information and knowledge they needed. That was not necessarily with the use of information at MCNY. This was confirmed by 17 (42%) respondents who agreed that as the tasks of their department changed frequently, they were always having to seek new knowledge that was not directly available in the MCNY databases or on the shared computer drive, while 12 (29%) gave no opinion, and another 12 (29%) disagreed. However, 17 (42%) respondents agreed that they were able to extensively re-use knowledge from the shared drive after making a few changes to adapt the retrieved knowledge to the current situation, while 15 (37%) were ambivalent, and 9 (21%) disagreed. Among the respondents, 12 (29%) agreed that the knowledge they found in the

shared drive could be applied to current situations with little or no need to seek out or create new knowledge, and 17 (42%) gave an ambivalent response while 12 (29%) disagreed. Figure 36 demonstrates the state of knowledge sharing at MCNY as a whole.

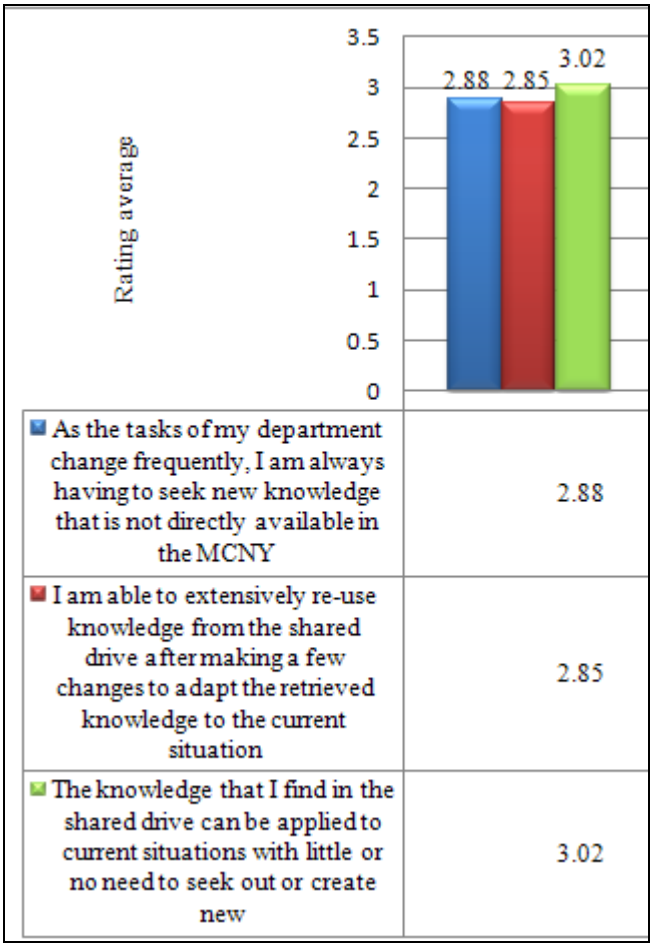
Figure 36: Knowledge sharing at MCNY



A rating average of 2.88 reflects that the option to agree was the most selected one, with a substantial number also giving no opinion, to the suggestion that as individual tasks in departments changed frequently, some employees had to seek new knowledge that was not directly available in the MCNY databases or on the shared computer drive. With regard to being able to extensively re-use knowledge from the shared drive after making a few changes to adapt the retrieved knowledge to current situations, a rating average of 2.85 reflects that most respondents agreed, and a large number of them gave no opinion. A rating average of 3.02 reflects that most respondents chose not to give an opinion in response to the suggestion that the knowledge found in the shared drive could be applied to current situations with little or no need to seek out or create new knowledge, even

though there was an equal distribution between those who agreed and those who disagreed. These perceptions are reflected in Figure 37.

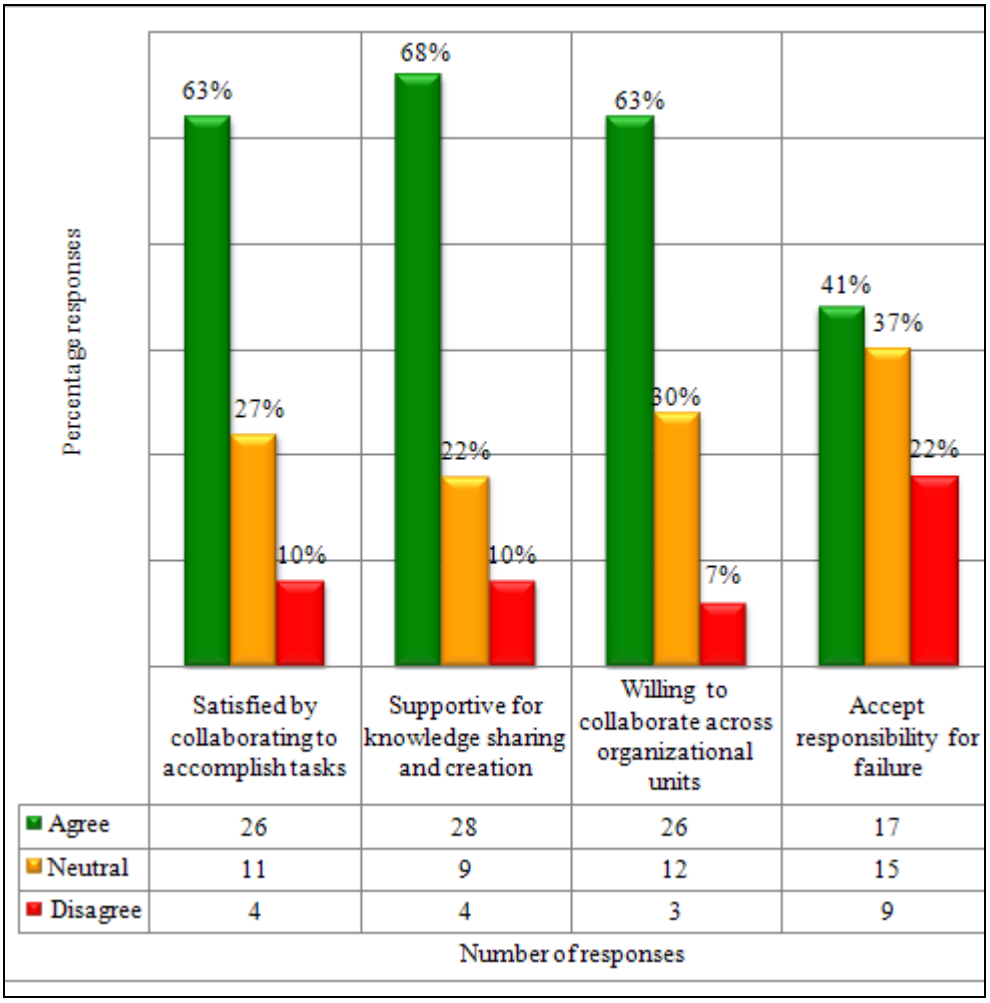
Figure 37: Knowledge sharing at MCNY (rating averages)



Closely related to the sharing of information and knowledge was the collaboration question. The spirit of collaboration and information sharing is enhanced if individuals value the knowledge and information their colleagues have (Parirokh, Daneshgar and Fattahi, 2008). Figure 38 reflects perceptions about departmental colleagues which indicate that 26 (63%) agreed that members of their departments were satisfied by collaborating to accomplish tasks, 11 (27%) did not give an opinion, and 4 (10%) disagreed. Among the respondents, 28 (68%) agreed that the members of their departments were supportive of knowledge sharing and creation, while 9 (22%) gave an

ambivalent response, and 4 (10%) disagreed. Additionally, 26 (63%) respondents were willing to collaborate across organizational units while 12 (30%) opted to use a non-committal response and 3 (7%) disagreed; and 17 (41%) agreed that members of their department were willing to accept responsibility for failure, while 15 (37%) would not commit themselves and thus gave no opinion, and 9 (22%) disagreed. This is depicted in Figure 38.

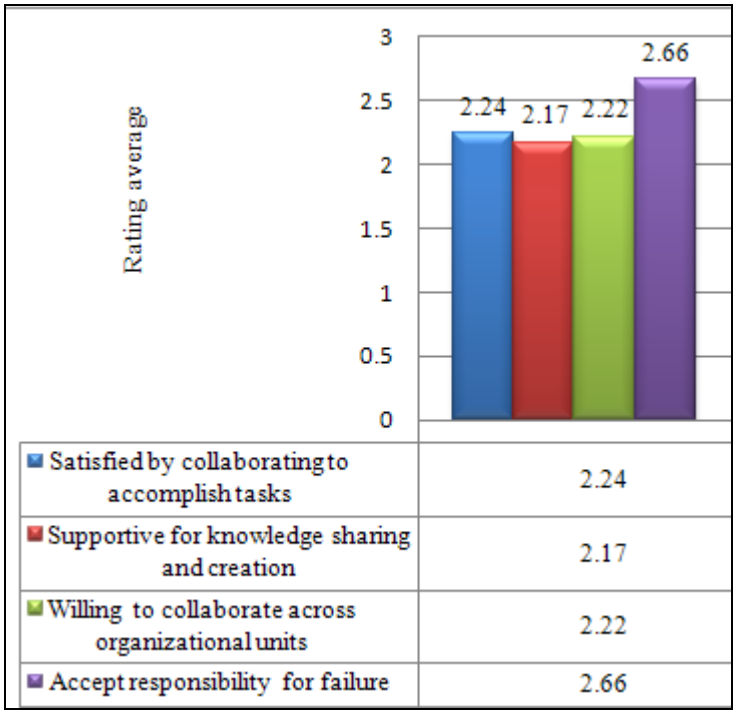
Figure 38: Individual perceptions about departmental colleagues



A rating average of 2.24 reflects that most respondents confirmed that colleagues were satisfied with collaborating to accomplish tasks. With a rating average of 2.17, a similar response pattern is also reflected in relation to colleagues being supportive of knowledge

sharing and creation. There was also the prevalence of the choice to agree to the perception about colleagues being willing to collaborate across organizational units as reflected by a 2.22 rating average. A rating average of 2.66 indicates the option to agree was the popularly chosen response to the perception about colleagues being prepared to accept responsibility for failure, but with a large number opting for the non-committal choice too. These perceptions are demonstrated in Figure 39.

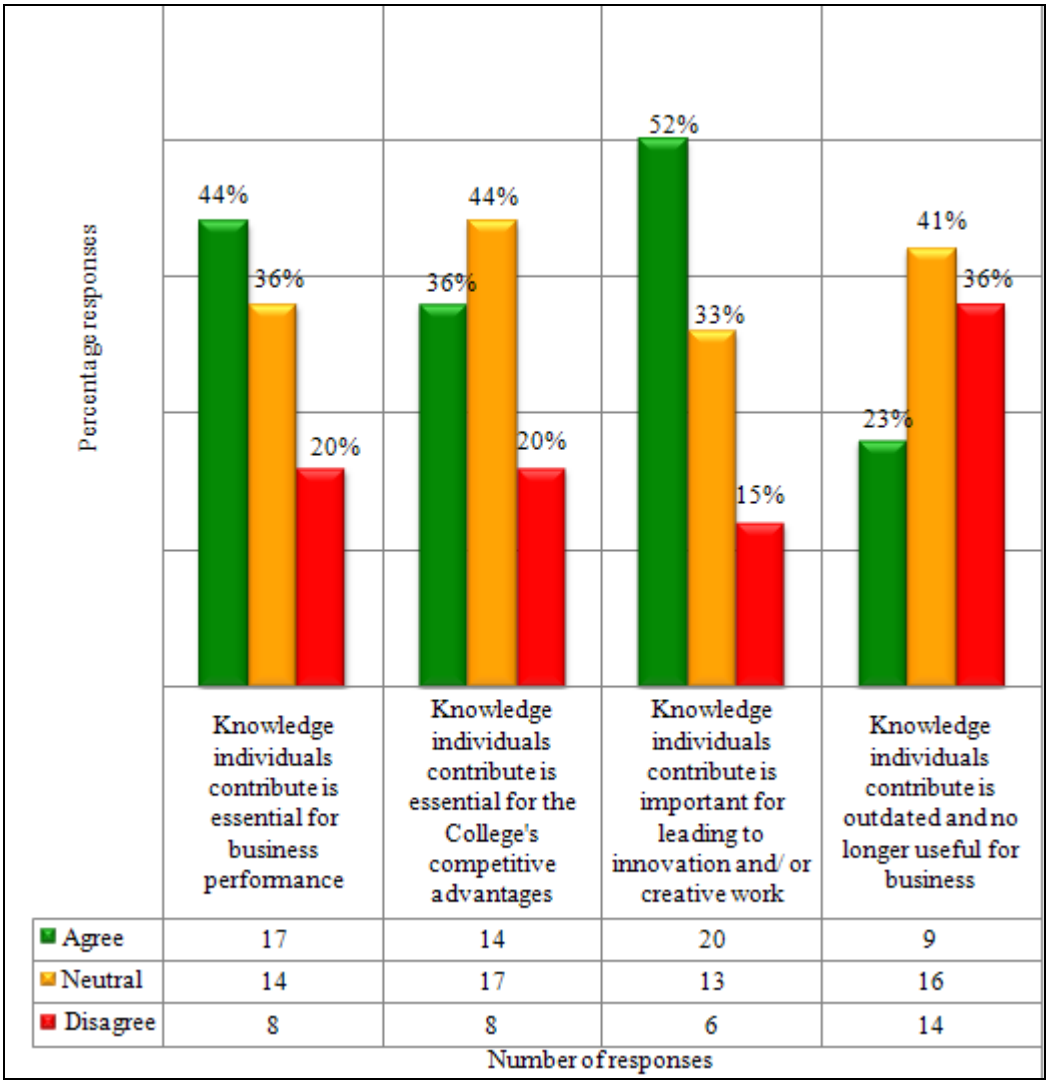
Figure 39: Individual perceptions about departmental colleagues (rating averages)



With that state of collaboration, the question was how individuals felt about the knowledge they shared in the performance of their duties. To explain that, 20 (52%) individuals agreed with the view that when colleagues asked them questions, they were towards creative works, while 13 (33%) gave no opinion, and 6 (15%) disagreed. Among the respondents, 17 (44%) agreed that the information their colleagues needed from them was essential for business, but 14 (36%) were ambivalent about that, while 8 (20%) disagreed. In relation to questions asked by colleagues and the relevance of their questions for the College's competitive advantage, 14 (36%) agreed, while 17 (44%)

gave no opinion, and 8 (20%) disagreed. Respondents felt that the knowledge sought from them was not outdated and still useful as demonstrated by 14 (36%) who disagreed, but 16 (41%) gave an ambivalent response, and 9 (36%) agreed. This is indicated in Figure 40.

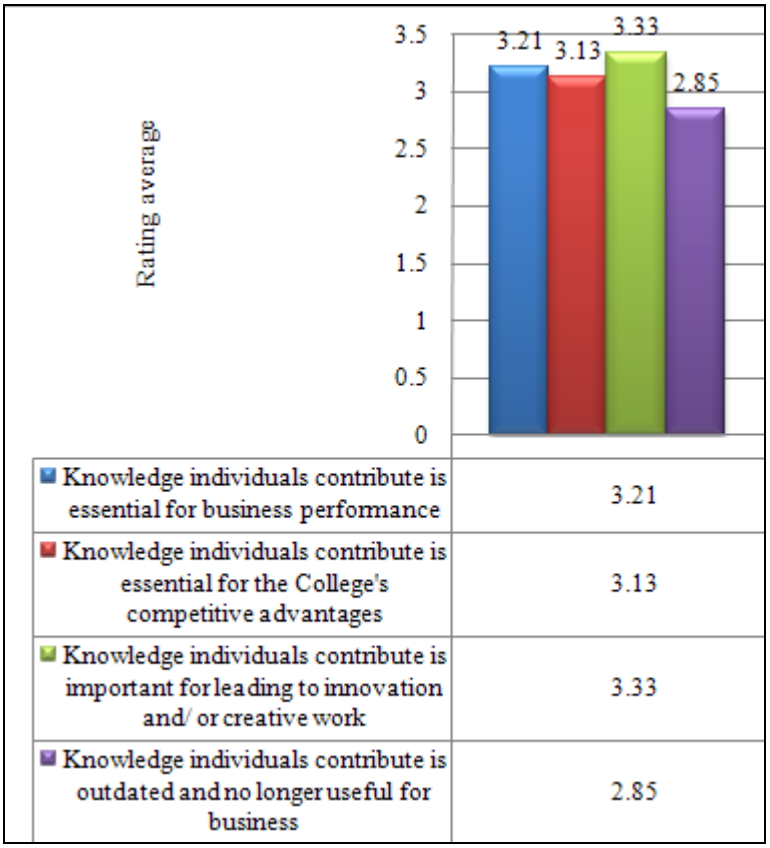
Figure 40: Value of knowledge shared



Rating averages of 3.21 and 3.13 are reflective of a majority of the respondents choosing to either agree or not to give an opinion about the fact that when colleagues approached them with knowledge needs, that was essential for business performance, and to the

perception that when colleagues approached them for knowledge that was essential for the College's competitive advantages. A similar pattern is reflected by a rating average of 3.33 indicating that most respondents opted to agree or to express ambivalence to the suggestion that colleagues approached them for knowledge that they perceived as important for leading to innovation and/ or creative work. However, a rating average of 2.85 indicates that the non-committal option was selected by the majority of respondents, with a tendency for some to also disagree with the suggestion that knowledge sought by colleagues was outdated and no longer useful for business. These perceptions are demonstrated in Figure 41.

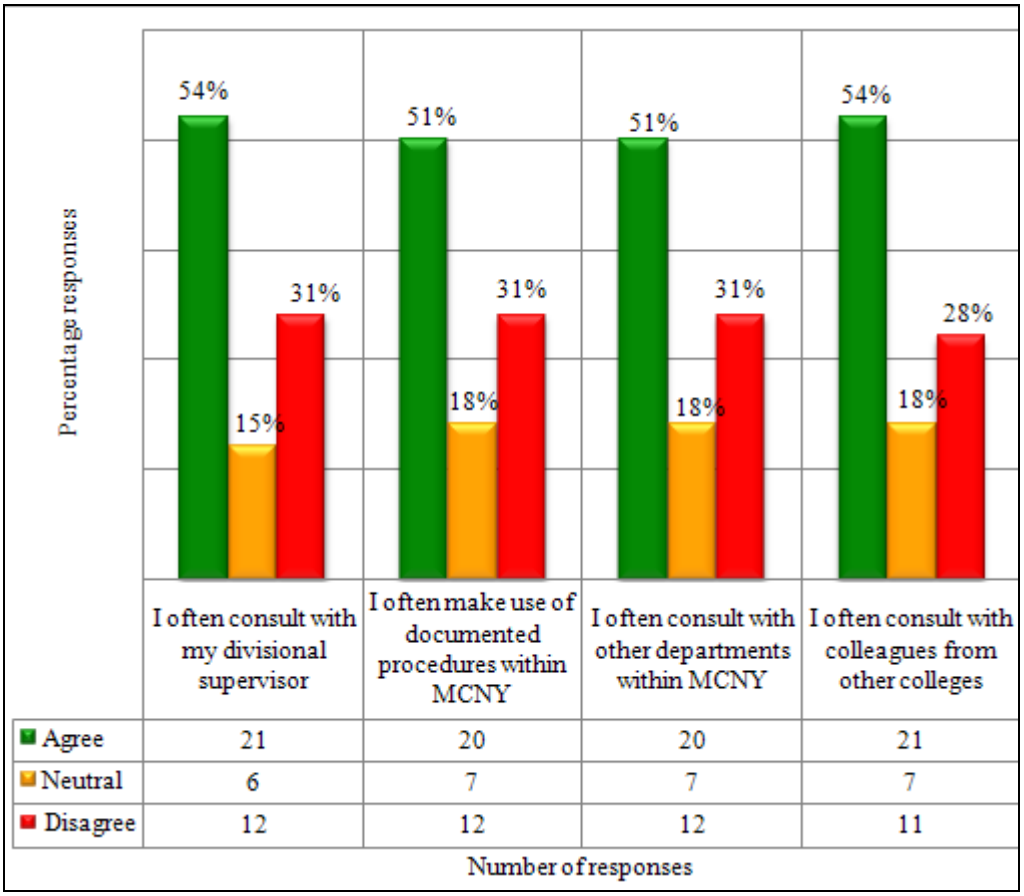
Figure 41: Value of knowledge shared (rating averages)



In relation to the knowledge support system at MCNY, Figure 42 depicts that 20 (51%) respondents agreed that they often used documented procedures at MCNY, while 7 (18%) gave a non-committal response, and 12 (31%) disagreed. Additionally, the same

figure of 20 (51%) agreed that they often consulted with other MCNY departments, while 7 (18%) gave no opinion, and 12 (31%) disagreed. There were 21 (54%) respondents who agreed that they often consulted with their divisional supervisors, while 6 (15%) opted to take an ambivalent position, and 12 (31%) disagreed; and another 21 (54%) agreed that they often consulted with colleagues from other colleges, but 7 (18%) were non-committal, and 11 (28%) disagreed.

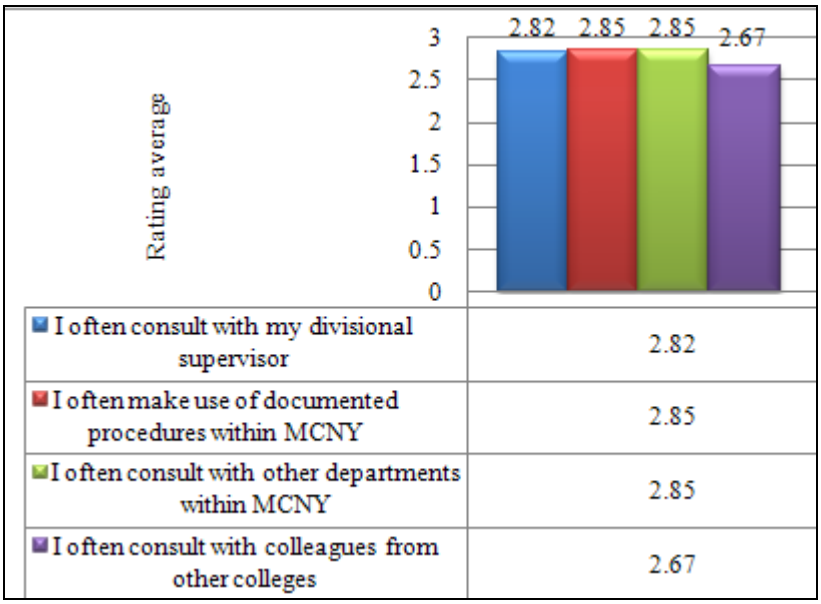
Figure 42: Knowledge support system to successfully accomplish given tasks



With a rating average of 2.82, respondents revealed that most of them agreed that they often consulted with their divisional supervisors when they needed to successfully accomplish tasks. A rating average of 2.85 also reveals that respondents agreed that they often made use of documented procedures within MCNY to accomplish their tasks. A similar pattern is reflected with regard to consulting with other departments within

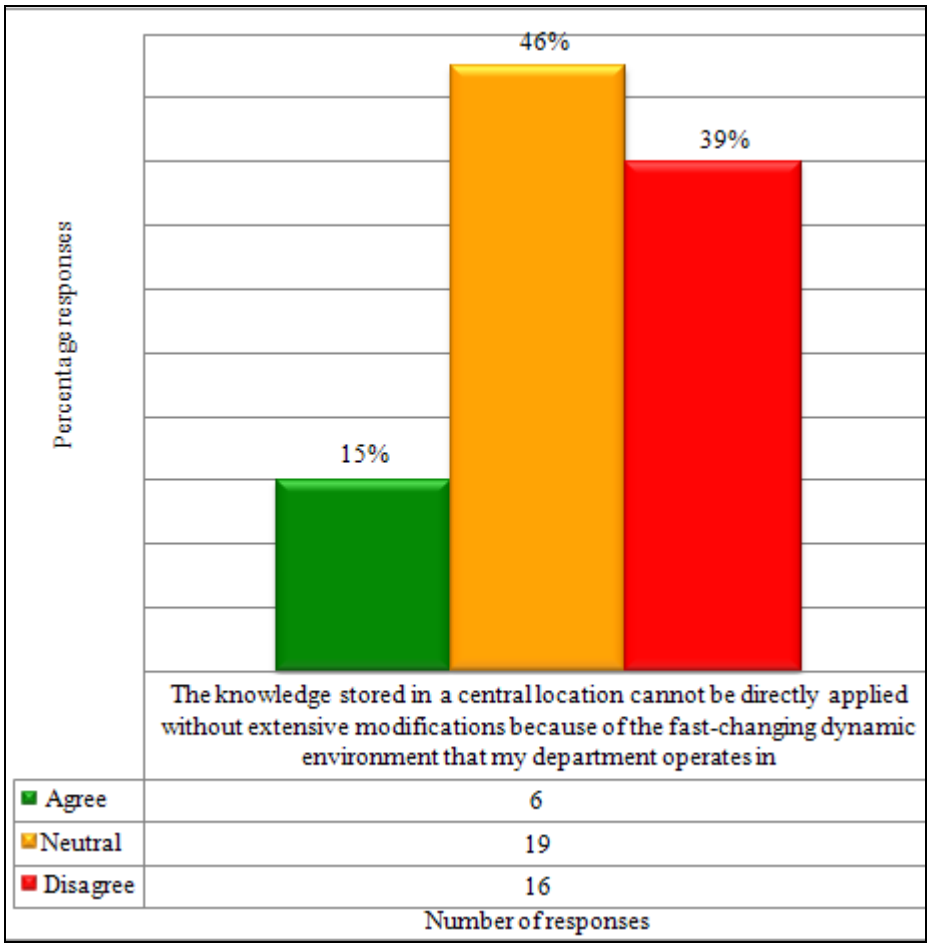
MCNY to accomplish tasks by a rating average of 2.85 as well as a rating average of 2.67 revealing their agreement to consulting often with colleagues from other colleges to accomplish their tasks. In each of the instances, there was a sizeable number of respondents disagreeing with those perceptions. These perceptions are demonstrated in Figure 43.

Figure 43: Knowledge support system to successfully accomplish given tasks (rating averages)



In terms of the knowledge stored in a central location being directly applied without extensive modifications because of the fast-paced dynamic environment that departments operated in, 19 (46%) chose not to give an opinion while 16 (39%) disagreed, and 6 (15%) agreed. These perceptions are demonstrated in Figure 44.

Figure 44: Quality of available knowledge

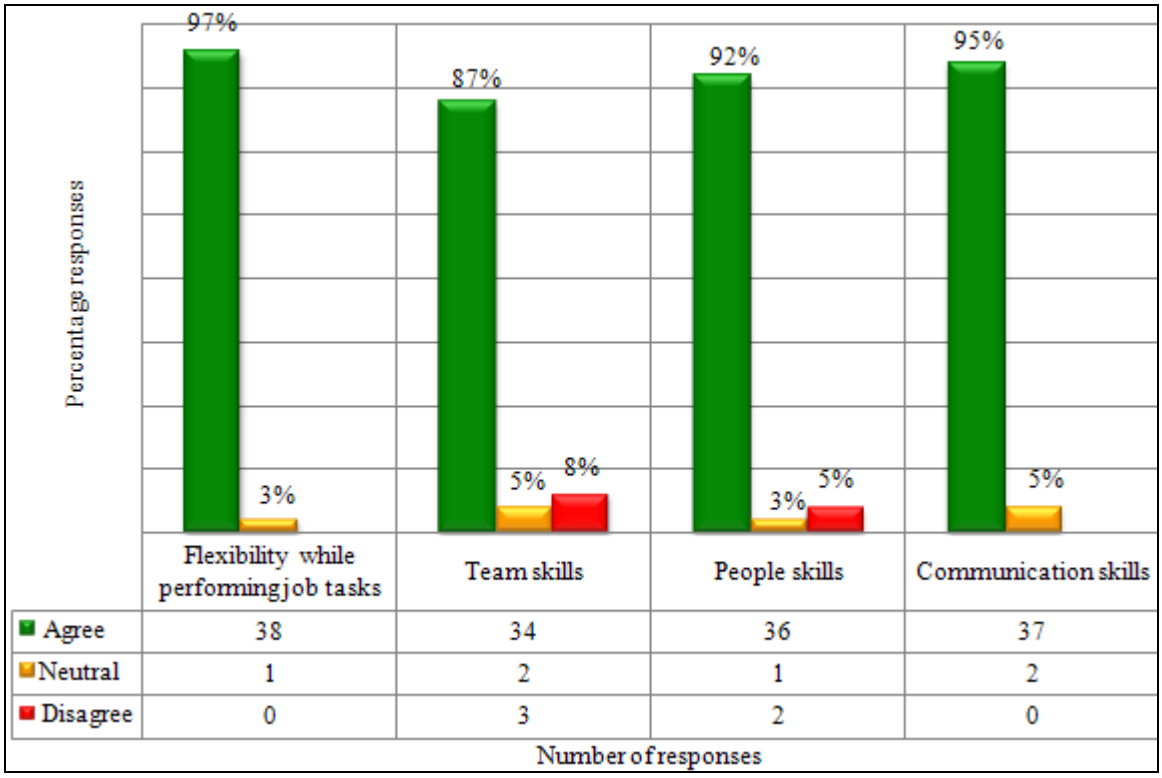


To reflect perceptions about the quality of available knowledge at MCNY, respondents opted not to give an opinion as reflected by a rating average of 3.27, with a smaller number disagreeing.

Besides the knowledge handling expertise that is conducive to knowledge transfer, there are certain individual attributes and skills that enable an environment for KM (Al-hawari, 2007; Lloria, 2008; Trivedi, 2007). In this study, they included flexibility in performing tasks, to which 38 (97%) agreed, and 1 (3%) did not give an opinion; team skills, to which 34 (87%) agreed, 2 (5%) gave a non-committal response, and 3 (8%) disagreed; people skills, to which 36 (92%) agreed, 1 (3%) opted not to give an opinion, and 2 (5%)

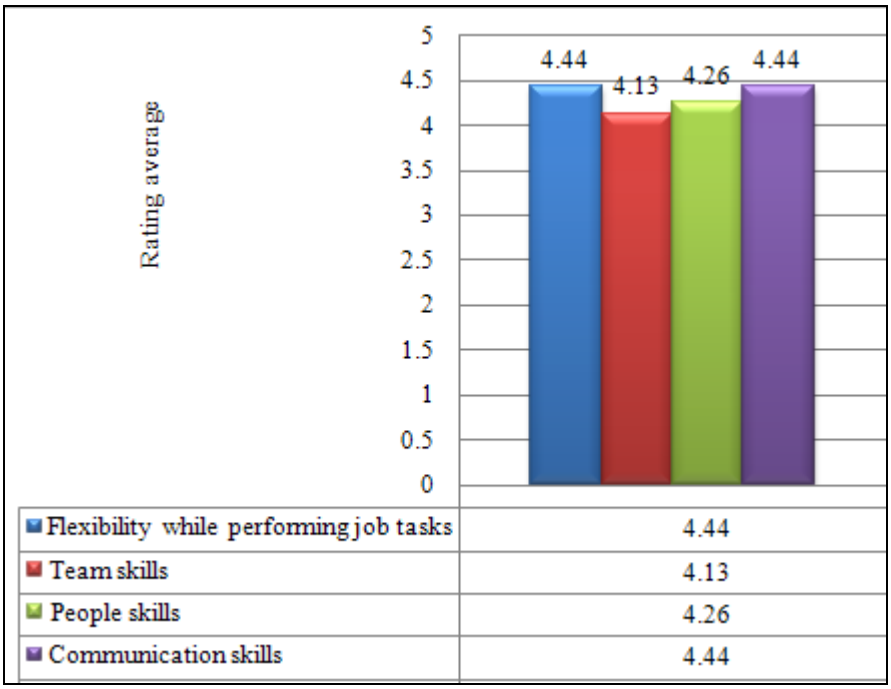
disagreed; and communication skills to which 37 (95%) agreed, and 2 (5%) gave a non-committal response. These perceptions are demonstrated in Figure 45.

Figure 45: Skills useful in a knowledge management environment



With rating averages of 4.44, 4.13, 4.26, and 4.44, the data reflects that respondents agreed that they were flexible while performing tasks, possessed team skills, possessed people skills, and had good communication skills respectively. A rating average that exceeded four also reflects that there was a small number of respondents who strongly agreed. These perceptions are demonstrated in Figure 46.

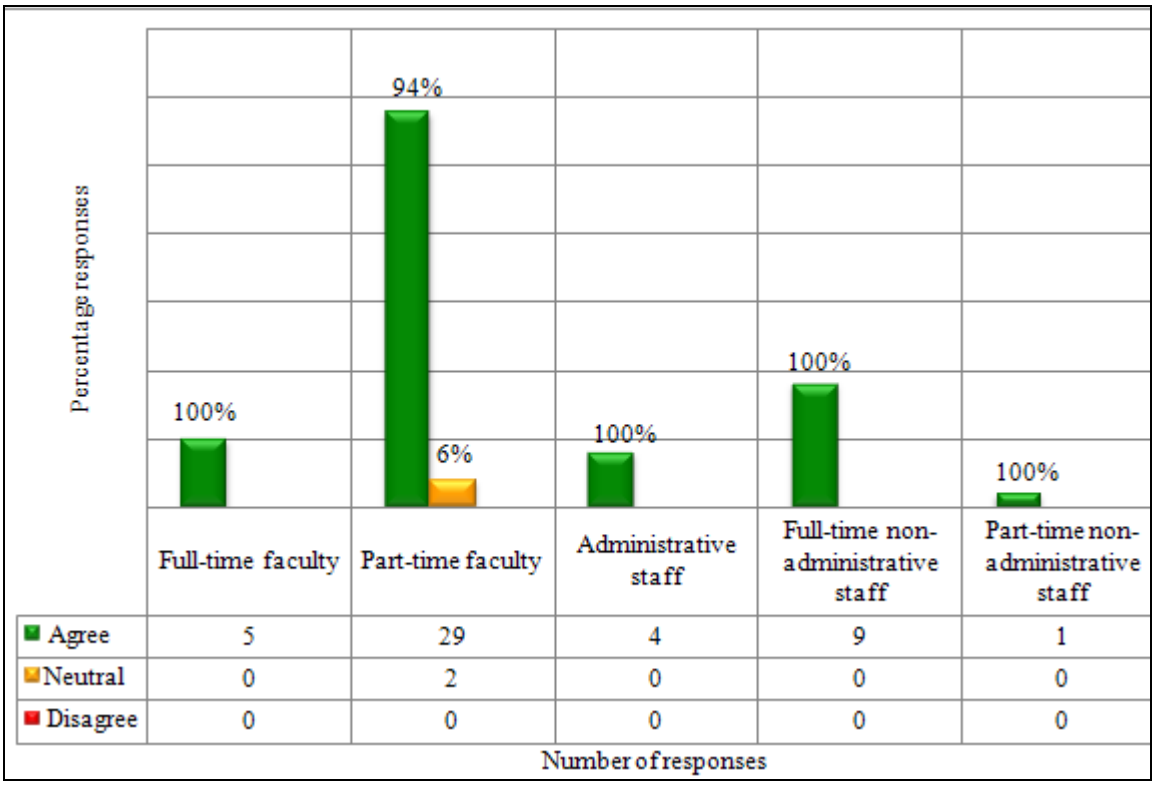
Figure 46: Skills useful in a knowledge management environment (rating averages)



4.2.5 Knowledge generation/ creation

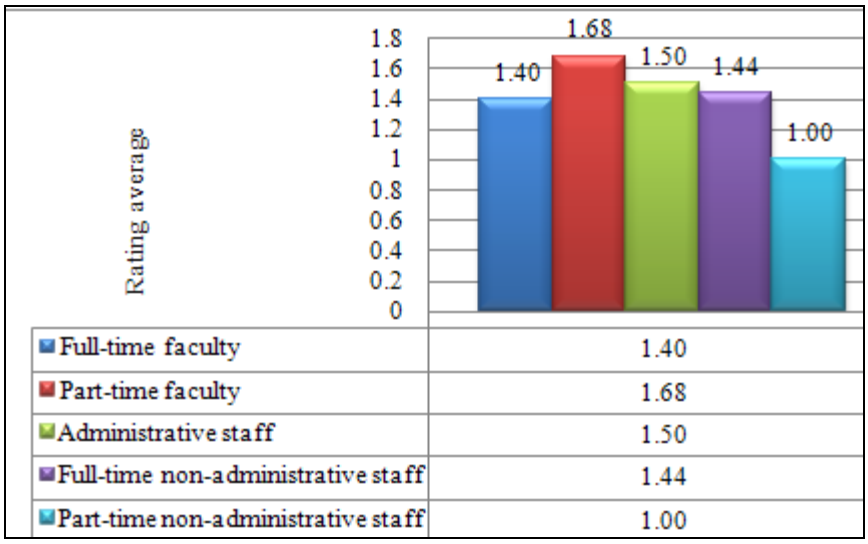
The creation of new knowledge and effectively exploiting the existing knowledge is an important process in KM practice (Nonaka and Takeuchi, 1995; Takeuchi, 2001; Ngulube and Lwoga, 2007). One of the ways to achieve that is through information use. From all the questionnaire responses, 2 (5%) did not agree that information use could lead to knowledge creation, while 39 (95%) respondents agreed. In terms of the distribution of responses, all 5 (100%) full-time faculty agreed that information use can lead to knowledge creation, while 29 (94%) part-time faculty agreed as well, and all 4 (100%) administrative staff agreed too. In addition, 9 (100%) non-administrative full-time staff, and the single non-administrative part-time respondent agreed. The only respondents who did not give an opinion were from the part-time faculty category. This is demonstrated in Figure 47.

Figure 47: Information use can lead to knowledge creation



With rating averages of 1.40, 1.68, 1.50, 1.44, and 1.00, full-time faculty, administrative staff, part-time faculty, full-time non-administrative staff, and part-time non-administrative staff respectively strongly agreed with the perception that information use can lead to knowledge creation. These perceptions are demonstrated in Figure 48.

Figure 48: Information use can lead to knowledge creation (rating averages)

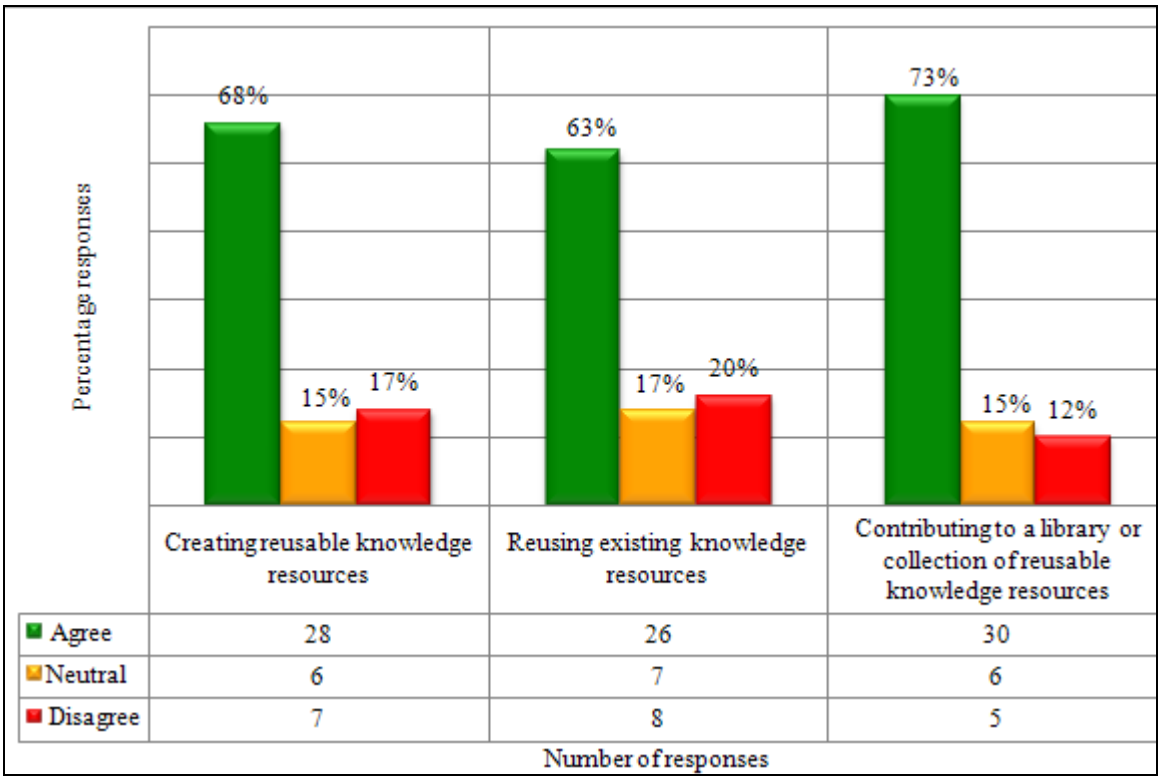


Full-time faculty	1.40
Part-time faculty	1.68
Administrative staff	1.50
Full-time non-administrative staff	1.44
Part-time non-administrative staff	1.00

The creation of knowledge was likely to happen if there were policies that enabled it (Hamid *et al*., 2007; Jain, 2007; Stankosky, 2005). Literature sources such as Barquin (2001), Koenig and Srikantaiah (2000), Sharma and Chowdhury (2007), Wen (2005), and Weddell (2008) suggest that the existence or absence of a reward and/ or incentives system can encourage individuals to contribute towards knowledge creation. The questionnaire therefore included questions targeted at finding out the perceptions of employees on the use of incentives and or rewards at MCNY for encouraging the creation of knowledge.

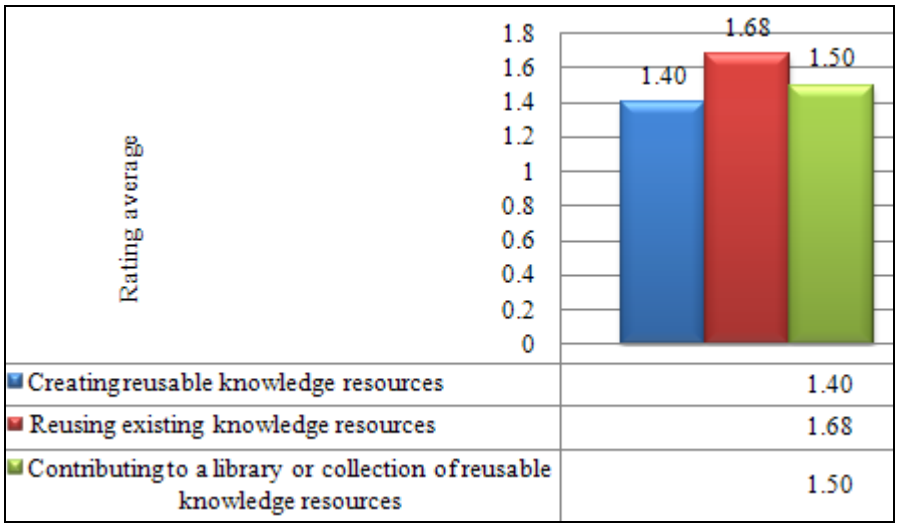
Asked if there should be a reward system for creating reusable knowledge resources 28 (68%) agreed, while 6 (15%) did not give an opinion, and 7 (17%) disagreed. Concerning putting in place incentives for reusing existing knowledge resources, 26 (63%) respondents agreed, while 7 (17%) remained ambivalent, 8 (20%) disagreed. In terms of incentives being used at MCNY for contributing to a library or collection of reusable knowledge resources, 30 (73%) agreed while 6 (15%) used the non-committal option, and 5 (12%) disagreed with that idea. Figure 49 summarizes these perceptions on the question of incentives.

Figure 49: Reasons for suggesting the use of a reward system



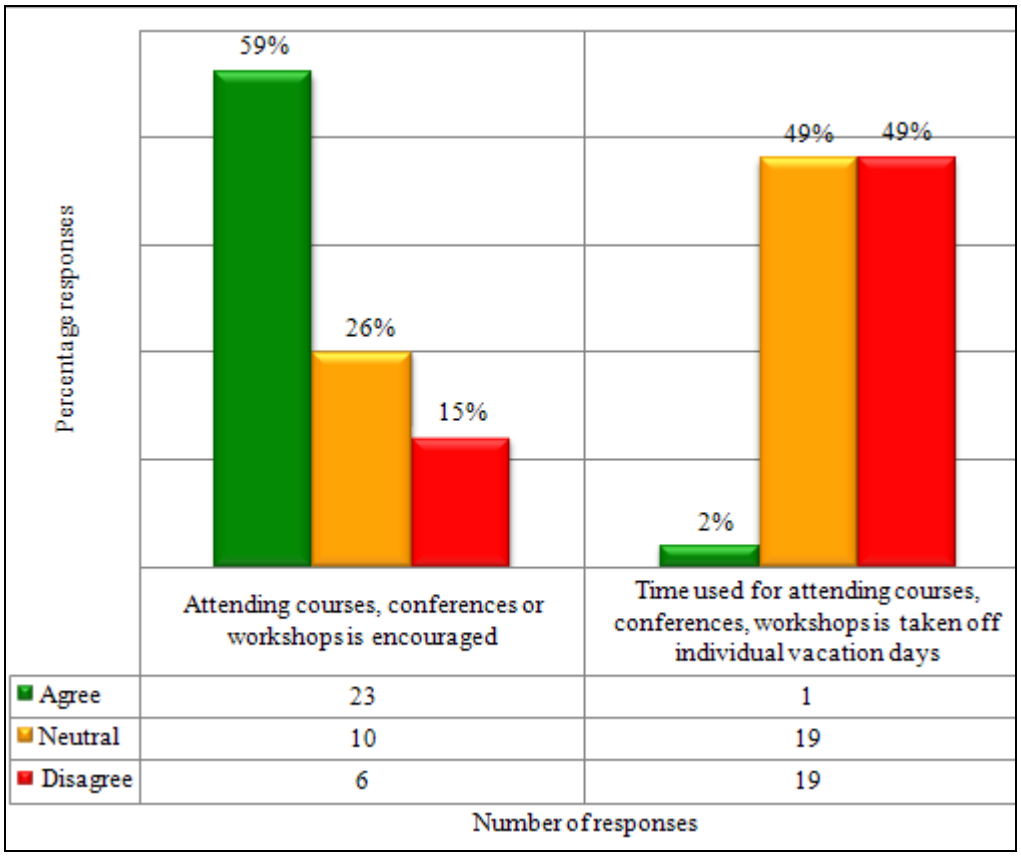
Rating averages of 2.37, 2.46, and 2.32 reflect that most respondents agreed with the perception that rewards should be in place for creating reusable knowledge resources, reusing existing knowledge resources, and contributing to a library or collection of reusable knowledge resources respectively. These perceptions are demonstrated in Figure 50.

Figure 50: Reasons for suggesting the use of a reward system (rating averages)



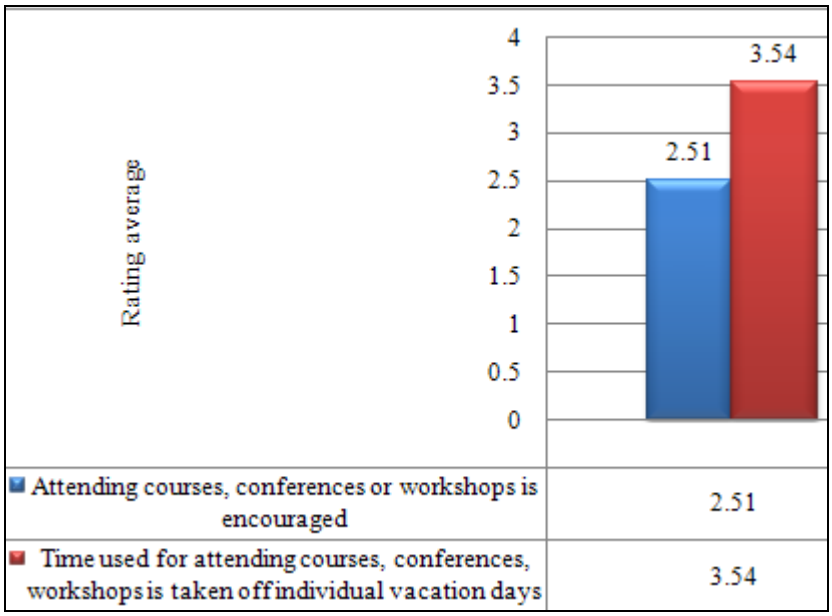
The kinds of incentives that were likely to attract included the fact that attending courses, conferences or workshops was encouraged as expressed by 23 (59%) respondents who agreed, even when 10 (26%) opted not to give an opinion, and 6 (15%) disagreed. With regard to the statement that time used for attending courses, conferences, workshops was taken off individual vacation days, 19 (49%) respondents disagreed with it, and 19 (49%) gave a non-committal response, while 1 (2%) agreed. This is demonstrated in Figure 51.

Figure 51: Incentives to enable knowledge creation



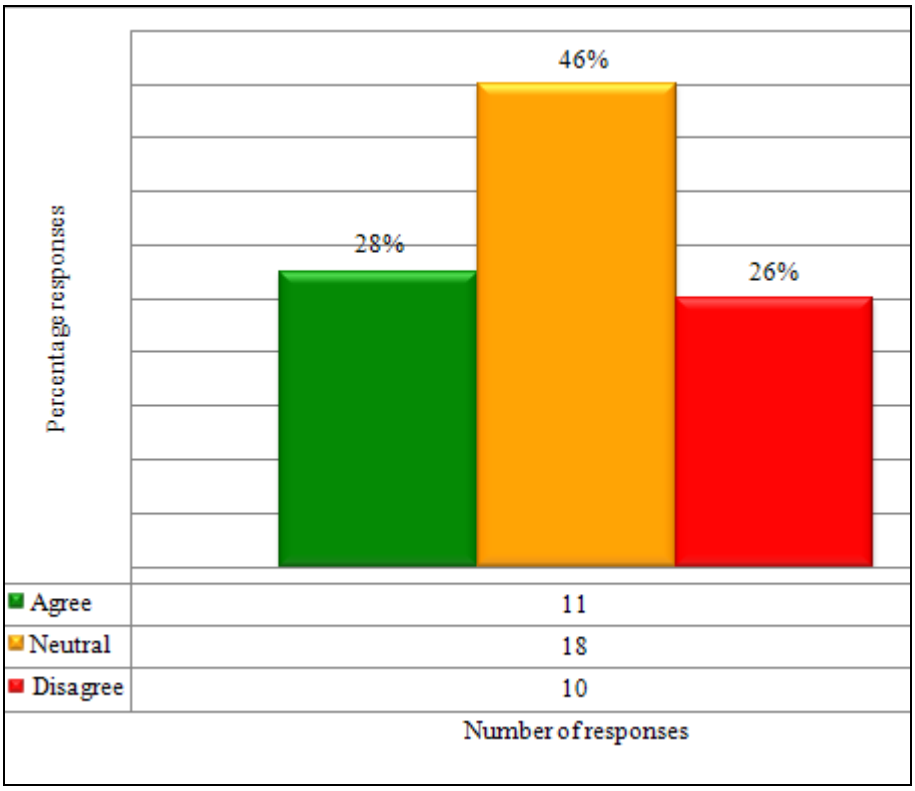
A rating average of 2.51 reflects the choice of the agreeing option by many questionnaire respondents to the question of attending courses, conferences or workshops as being typical in College departments. This rating average is suggestive of the choice not to give an option as having been made by a sizeable number of respondents. With regard to time used for attending courses, conferences, workshops being taken off individual vacation days, there was a rating average of 3.54, signifying that there were almost as many respondents who disagreed as those who gave no opinion about that suggestion. These perceptions are reflected in Figure 52.

Figure 52: Incentives to enable knowledge creation (rating averages)



In addition to a reward system, the policy and directives in the College were considered by the researcher as having the potential to encourage or discourage knowledge sharing, and that in turn impacting an enabling environment for knowledge creation. This consideration was in line with the findings of Hayes (2007) in the context of the University of Edinburgh library where the results suggested the importance of the support of organizational decision makers as essential to the success of KM. There were 18 (46%) respondents who did not give an opinion to the perception that organizational directives or policy could be a barrier to one's ability to store received information more efficiently, while 11 (28%) agreed, and 10 (20%) disagreed. This is demonstrated in Figure 53.

Figure 53: Organizational policy/ directives perceived as barriers to knowledge sharing in knowledge management practice



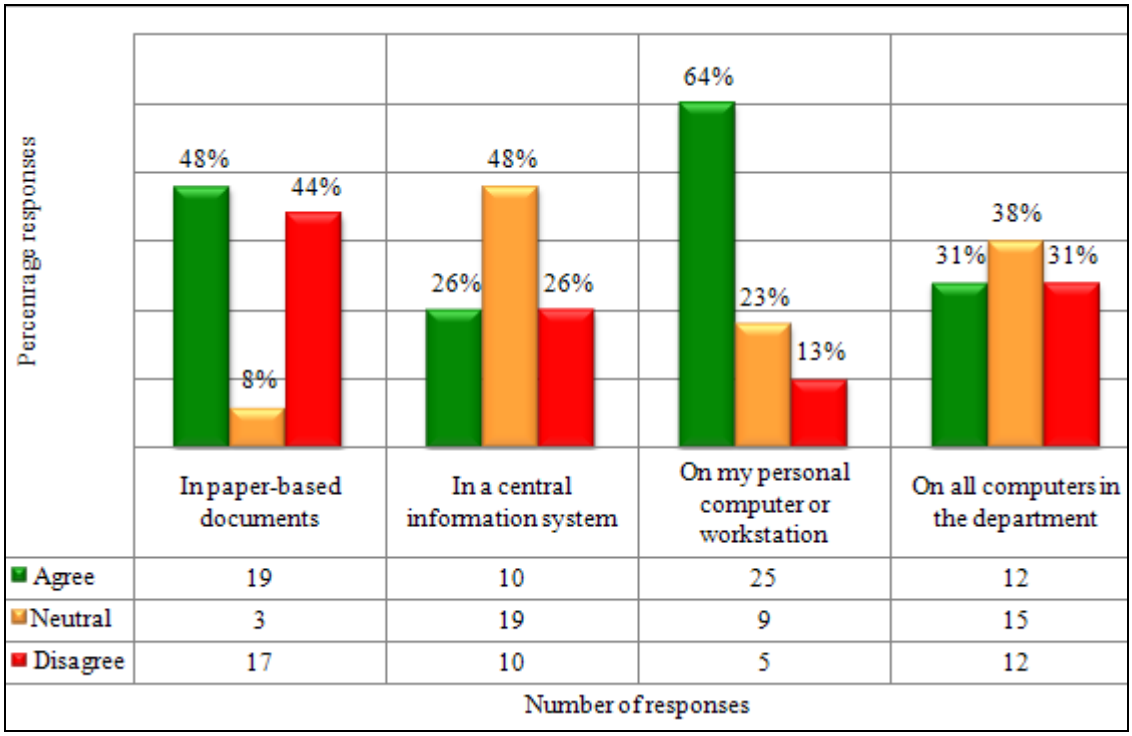
A rating average of 2.90 indicates that the non-committal response was used the most in expressing perceptions about organizational policy or directives being a barrier to knowledge sharing.

4.2.5.1 Documented processes for knowledge creation

A system that maintains consistency of approach is likely to be dependent on documented sources (Weddell, 2008; Zhang, Tian and Qi, 2006). At MCNY, it was established by the questionnaire that there was documented knowledge in paper-based documents as confirmed by 19 (48%) who agreed, even though 3 (8%) gave a non-committal response and 17 (44%) disagreed. With regard to documented knowledge being on all computer workstations in the department, 12 (31%) respondents agreed while 15 (38%) remained ambivalent, and 12 (31%) disagreed. There were 25 (64%) respondents who agreed that

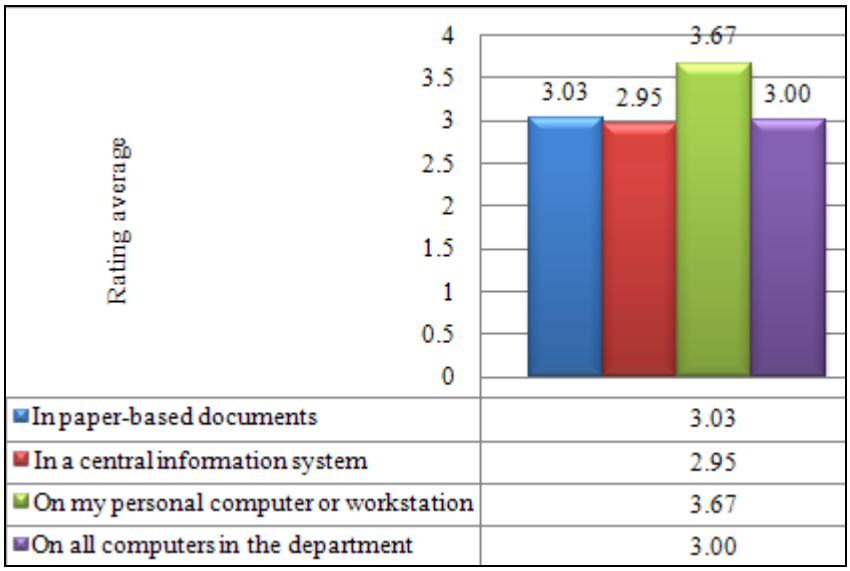
documented knowledge was on their individual/ personal computer workstations while 9 (23%) gave no opinion about that, and 5 (13%) disagreed. To the fact that documented knowledge was in a centralized computer system, 10 (26%) agreed, while 19 (48%) were non-committal, and another 10 (26%) disagreed. These perceptions are expressed in Figure 54.

Figure 54: Storage and location of documented knowledge



The rating average of 3.03 signifies that a large number of respondents agreed that knowledge was stored in paper-based documents, but with a substantial number of them disagreeing. A rating average of 2.95 also signifies a tendency towards not giving an opinion to the existence of a central information system, while a rating average of 3.67 signifies that a large number of respondents agreed with the suggestion that knowledge was on personal computers. A rating average of 3.00 signifies a majority using the non-committal option to the suggestion that knowledge existed on all computers in the department. These perceptions are demonstrated in Figure 55.

Figure 55: Storage and location of documented knowledge (rating averages)



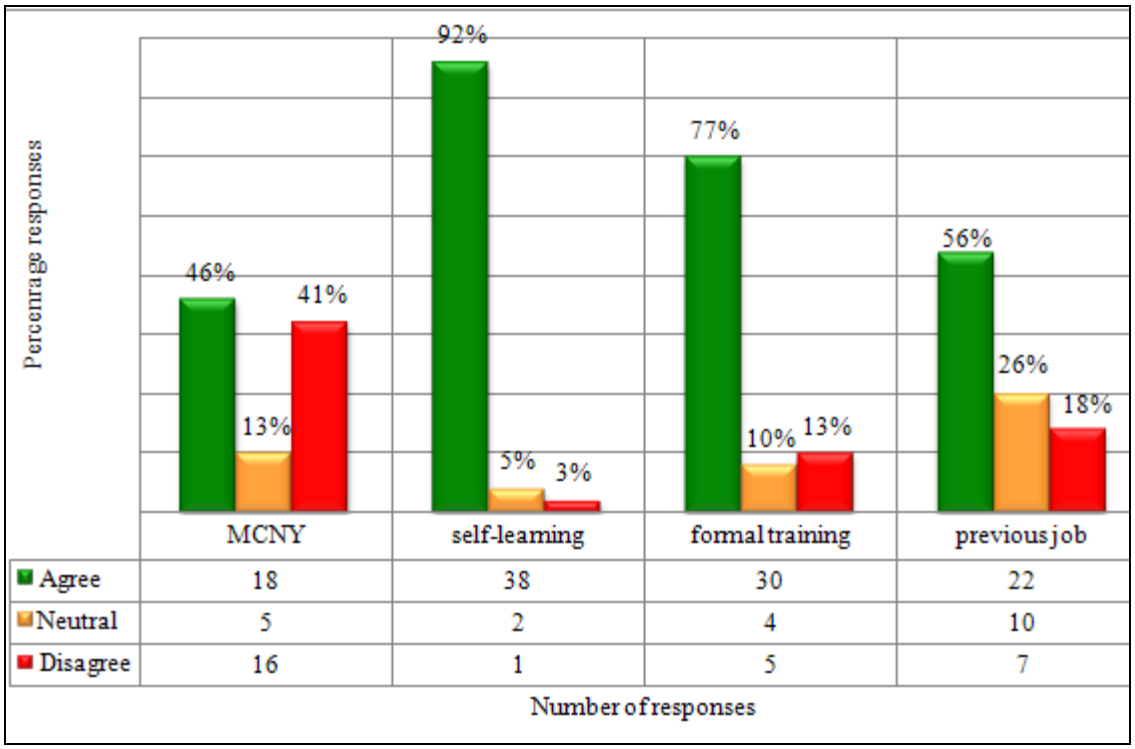
In paper-based documents	3.03
In a central information system	2.95
On my personal computer or workstation	3.67
On all computers in the department	3.00

4.2.5.2 Sources of skills and competencies for knowledge creation

Information on where or how employees became competent to fulfil their job functions was relevant because it had the potential to indicate how much MCNY could contribute to the development of employee skills and competencies, particularly where gaps were realized. This was in line with the suggestions of Wen (2005) who advocated the skills development of existing staff in implementing KM practice.

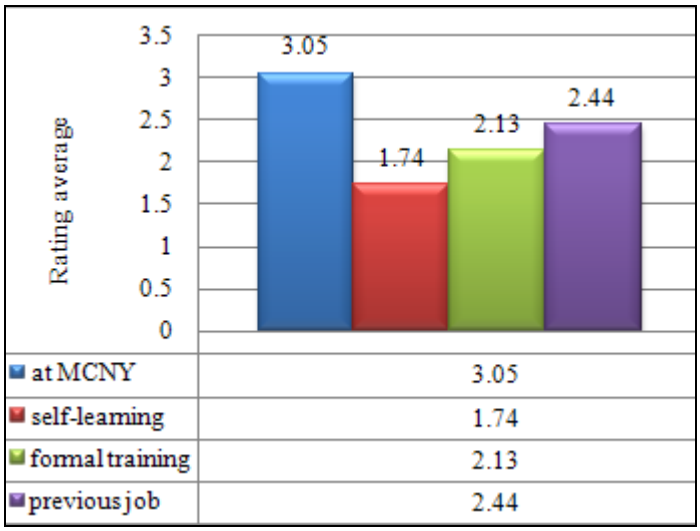
Among the respondents, 18 (46%) agreed that the skills and expertise they were using in their jobs for the previous six months were acquired at MCNY, while 16 (41%) disagreed with this perception, and 5 (13%) gave no opinion. Additionally, 38 (92%) respondents agreed and 2 (5%) gave a non-committal response, while 1 (3%) disagreed that they acquired them through self-learning. Formal training was also another source of skills and expertise as demonstrated by 30 (77%) respondents who agreed, while 4 (10%) gave an ambivalent response, and 5 (13%) disagreed with this. Another 22 (56%) agreed that the knowledge they had originated from their previous job, but 10 (26%) gave no opinion, and 7 (18%) disagreed. This is reflected in Figure 56.

Figure 56: Origin of knowledge and skills of MCNY employees



A rating average of 3.05 reflects that the most selected responses were split between disagreeing and agreeing with the suggestion that MCNY was the origin of knowledge that individuals used in their jobs. With regard to knowledge having been gained through self-learning, a rating average of 1.74 reflects that most respondents strongly agreed with the perception. Formal training was also perceived as a source of skills and knowledge as indicated by a rating average of 2.13 that signifies that respondents agreed. Respondents also agreed that previous jobs were significant sources of knowledge and skills as reflected by a rating average of 2.44, but some of them disagreed with that. These perceptions are demonstrated in Figure 57.

Figure 57: Origin of knowledge and skills of MCNY employees (rating averages)

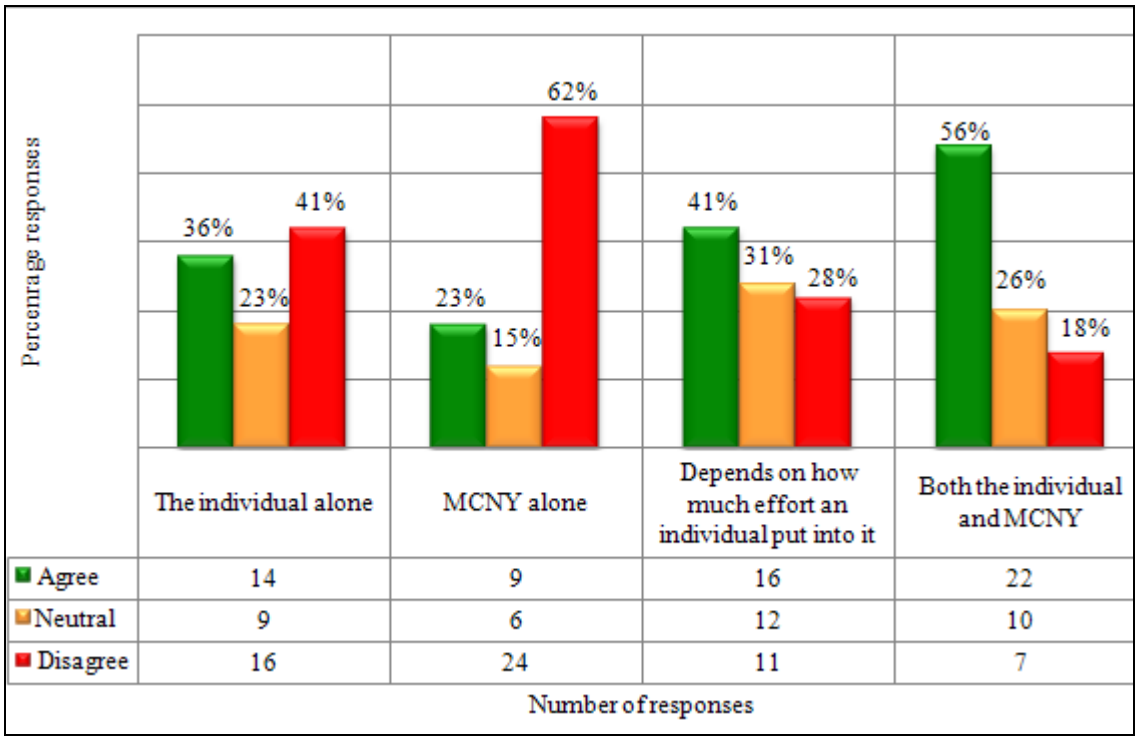


Out of all the answered questionnaires, 4 (8% or the total sample of 79) came from the library. The library had a total of seven full-time staff members. They reflected that most of the skills that they had been using in their jobs for the previous six months came from MCNY (three, that was 75% of library respondents), formal education (two, that is 50% of library respondents), and through self-learning (three, that was 75% of library respondents). Formal training was a significant factor too as reflected by 2 (50% of library respondents). The fact that self-learning and what was learnt at MCNY were significant for this employee group indicated their most practical way of giving a service in an information environment that demanded continuous learning. The interest in looking at the competencies of librarians in a fast changing information environment was because the skills are important in the generation of knowledge.

It was important to find out the perceptions of individuals about who knowledge belonged to, once it had been acquired. The researcher perceived the relevance of this factor to be that there could potentially be conflict between individual interests and institutional expediency in the ownership of knowledge. This was in line with the suggestions of Kulkarni, Ravindran and Freeze (2006) who found individual interactions in a workplace to be anchored in self-interest. Among the respondents, 14 (36%) agreed

that it belonged to themselves alone as individuals, while 16 (41%) disagreed with that notion, and 9 (23%) gave no opinion. Concerning the knowledge belonging to MCNY alone, 9 (23%) agreed, 6 (15%) gave a non-committal response while 24 (62%) disagreed. With regard to whether ownership was dependent on effort put into gaining the knowledge, 16 (41%) respondents agreed, while 12 (31%) gave an ambivalent response, and 11 (28%) disagreed. Concerning knowledge gained belonging to both MCNY and the individual involved, responses indicated that 22 (56%) agreed, 10 (26%) gave no opinion, and 7 (18%) disagreed. This is reflected in Figure 58.

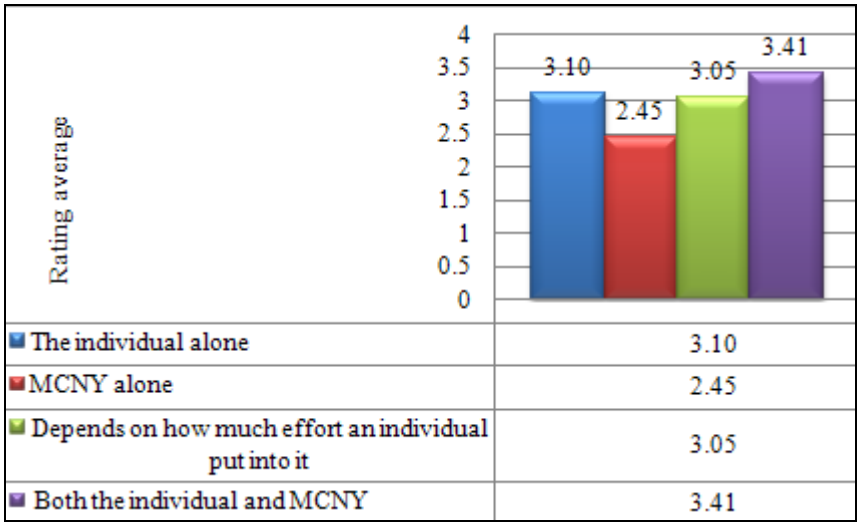
Figure 58: Ownership of knowledge gained at MCNY



In this question, the "disagree" position was rated as five. As such, a rating average of 3.10, indicates that there was a split between the option to disagree and to agree with regard to the ownership of knowledge gained at MCNY belonging to the individual alone. A rating average of 2.46 reflects that most respondents disagreed that knowledge gained at MCNY belonged to the College alone. With regard to the effort made as a determinant of who owned the knowledge gained, a rating average of 3.05 reflects that

most respondents agreed, but with a sizeable number of them not giving an opinion. Regarding the ownership of knowledge being with both the individual and MCNY, a rating average of 3.41 reflects that most respondents agreed, with some of them maintaining the non-committal position. These perceptions are demonstrated in Figure 59.

Figure 59: Ownership of knowledge gained at MCNY (rating averages)



4.2.6 Knowledge acquisition

When discussing issues related to knowledge acquisition, it was important to bear in mind that a vast amount of knowledge is in the heads of experts (Davenport and Prusak, 1998; Rao, 2004). This knowledge could remain unused if not tapped. MCNY, as an institution of higher learning, had experts in various academic disciplines besides those in administrative and non-administrative positions. At every point in time, their knowledge needed to be used for the advantage of the College. This implied that knowledge was sometimes relevant for limited periods of time, beyond which it became common or irrelevant. So timeliness was important (Kulkarni, Ravindran and Freeze, 2006). The use of knowledge "expert systems" was suggested by Koenig and Srikantaiah (2000) as a way that knowledge acquisition could be done to achieve the gradual tapping of

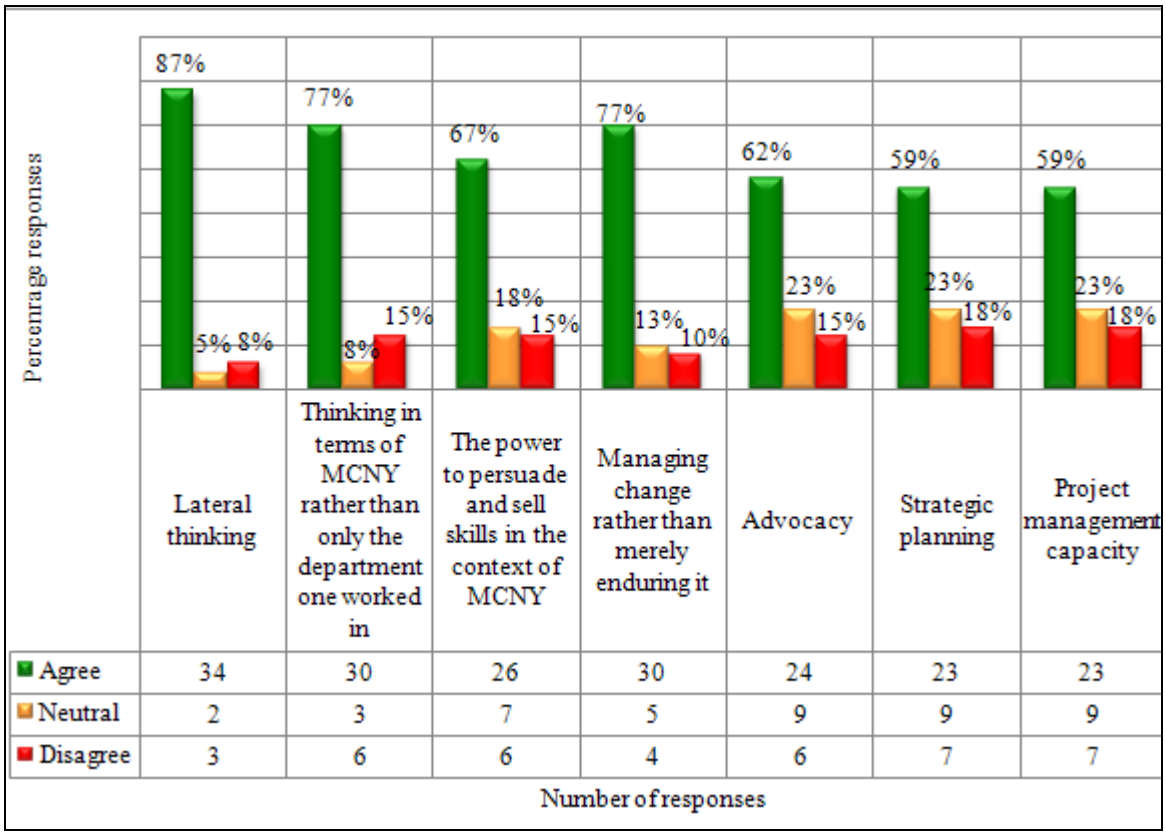
knowledge existing in the heads of experts while it was still useful. In other words, an expert system contains knowledge used by human experts in contrast to knowledge gathered from non-experts and textbooks. Among many considerations for an expert knowledge system is the identification of experts or individuals with expert skills that justifies the need for such a system to be in place.

4.2.6.1 Expert skills at MCNY

In this study, individuals in the College were viewed as having been placed where they were because they had the knowledge and expertise to accomplish the given tasks. Among questionnaire respondents, 34 (87%) indicated that they were involved in lateral thinking, that is, adapting thinking to suit changing concepts and perceptions about the service that one provided to the MCNY community, 2 (5%) gave no opinion, and 3 (8%) disagreed. While 23 (59%) respondents agreed that they were involved in strategic planning, 9 (23%) gave a non-committal response, and 7 (18%) disagreed. Similarly, there were 23 (59%) respondents who perceived that they needed to have project management capacity, while 9 (23%) gave an ambivalent response to that, and 7 (18%) disagreed. In terms of their work requiring them to think in terms of MCNY rather than only the department they worked in, 30 (77%) respondents agreed, but 6 (15%) disagreed with that, while 3 (8%) opted to use a non-committal response.

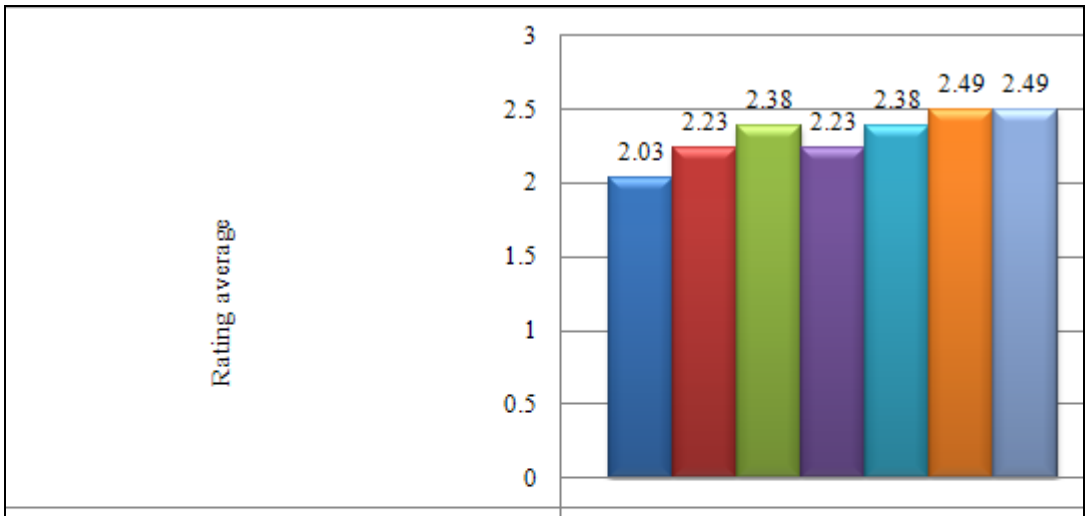
Regarding the possession of the power to persuade and sell one's skills in the context of MCNY, 26 (67%) respondents agreed, 7 (18%) gave a no opinion, and 6 (15%) disagreed that this was a skill they used. Having the capability to manage change rather than merely endure their work situations was another aspect that needed investigating, to which 30 (77%) agreed, 5 (13%) gave an ambivalent response, and 4 (10%) disagreed. Asked whether they used the advocacy skill, 24 (62%) respondents agreed that they did, and 9 (23%) gave a non-committal response, while 6 (15%) disagreed. All this is reflected in Figure 60.

Figure 60: Expert skills used in the accomplishment of duties at MCNY



The rating averages of 2.03, 2.23, 2.38, 2.23, 2.38, 2.49, and 2.54, reflect that respondents agreed with the perceptions about them using lateral thinking, that is, adapting their thinking to suit changing concepts and perceptions about the service that they provided to the MCNY community, thinking in terms of MCNY rather than only the department they worked in, possessing the power to persuade and sell their skills in the context of MCNY, being able to manage change rather than merely enduring it, participating in advocacy activities, strategic planning, and having project management capabilities respectively. These perceptions are reflected in Figure 61.

Figure 61: Expert skills used in the accomplishment of duties at MCNY (rating averages)



Lateral thinking	2.03
Thinking in terms of MCNY rather than only the department one worked in	2.23
The power to persuade and sell skills in the context of MCNY	2.38
Managing change rather than merely enduring it	2.23
Advocacy	2.38
Strategic planning	2.49
Project management capacity	2.49

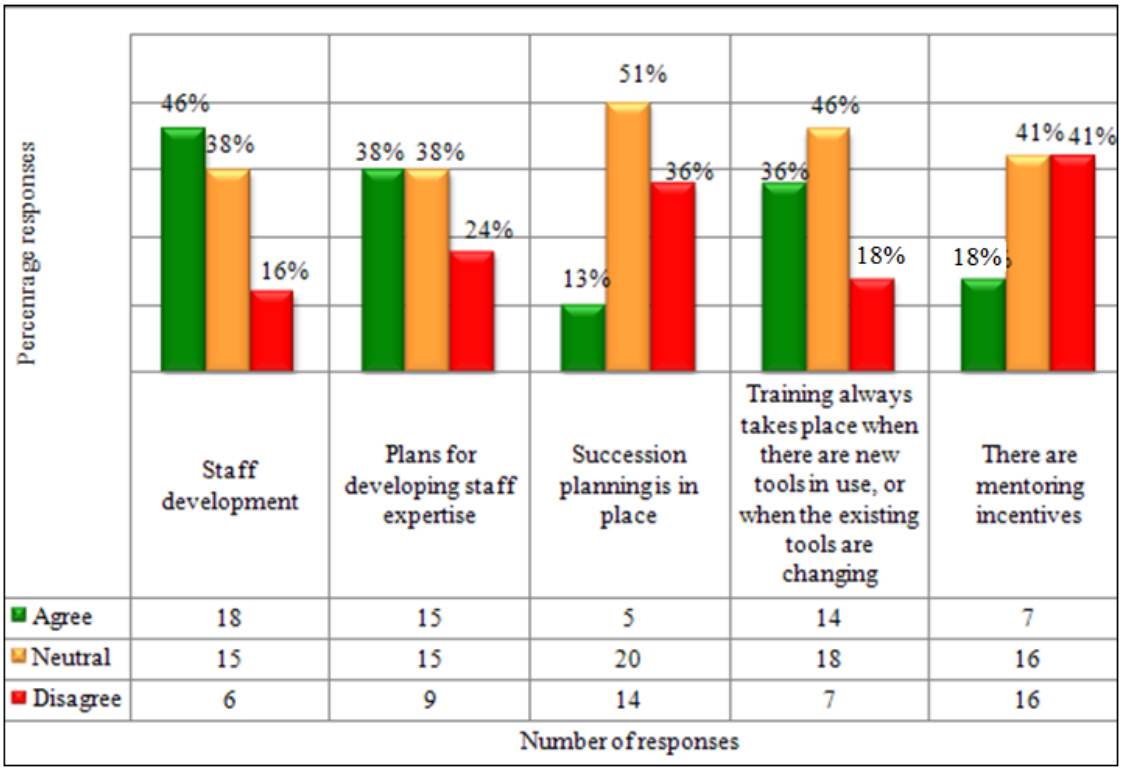
4.2.6.2 Professional training

Knowledge acquisition can be enhanced by providing training or training opportunities for staff (Jantz, 2001; Wen, 2005). This is due to the possibility that once they are trained, they become knowledgeable, making them move towards the expert level. In that case, it becomes important to put in place systems that tap the knowledge acquired. Training opportunities, as demonstrated in Figure 62 were in place both in the MCNY library and in the College as a whole.

There were 18 (46%) respondents who agreed that there were staff development opportunities at MCNY, while 15 (38%) opted not to give an opinion, and 6 (16%)

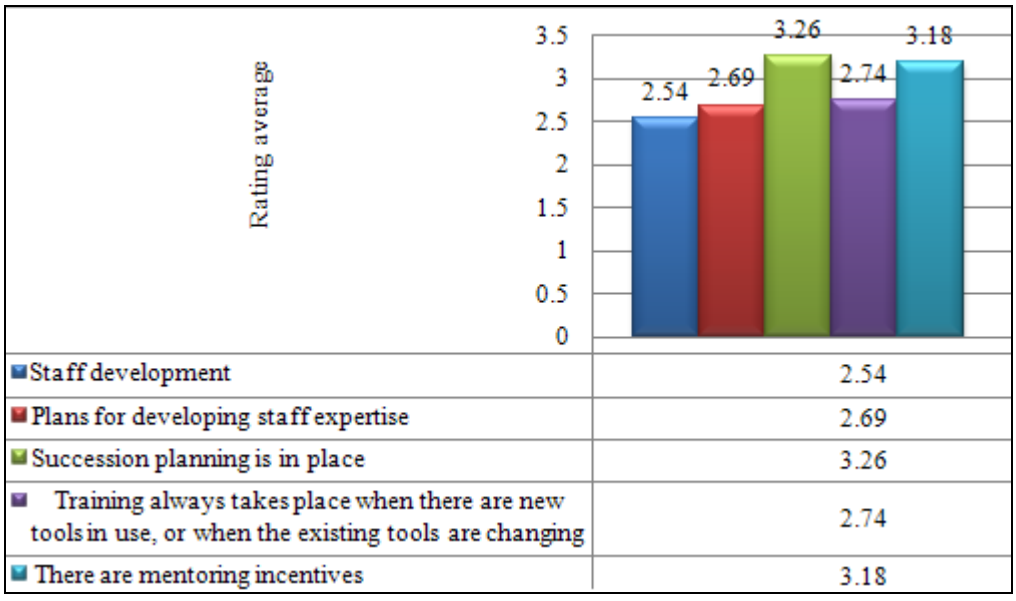
disagreed. In terms of the existence of departmental plans for staff developments, 15 (38%) agreed and 15 (38%) gave a non-committal response, while 9 (24%) disagreed. There was the perception by some employees that the existence of succession planning in departments did not exist as reflected by 14 (36%) who concurred that it did not exist, but 20 (51%) gave an ambivalent response, and 3 (13%) felt that it existed. With regard to the use of mentoring as a staff development strategy, 7 (18%) individuals agreed that there were mentoring incentives, while 16 (41%) gave a non-committal response, and another 16 (41%) disagreed. This could actually be a misreading of the question because at MCNY there was a mentoring department for students, not for management practice. There were also some employees with the perception that training took place when there were new tools in use as reflected by 14 (36%) agreeing, while 18 (46%) remained non-committal, and 7 (18%) disagreed.

Figure 62: Departmental practices that can enable knowledge management practice



With regard to departmental practices that enabled KM practice, a rating average of 2.54 reflects the affirmative position as the most selected choice relating to the existence/ absence of a staff development programme, but with the non-committal option being popular too. There was a split between the option to agree and the non-committal stance as reflected by a rating average of 2.69 with regard to the existence/ absence of plans for developing staff expertise. A rating average of 3.26 with regard to succession planning reflects the prevalence of the non-committal position, but with the next highly selected choice being the option to disagree. A rating average of 2.74 reflects the majority choice of the non-committal position but with the option to agree being the next popular choice. With regard to the absence/ existence of mentoring incentives, a rating average of 3.18 reflects the non-committal position and the option to disagree as having been selected the most. These perceptions are reflected in Figure 63.

Figure 63: Departmental practices that can enable knowledge management practice (rating averages)

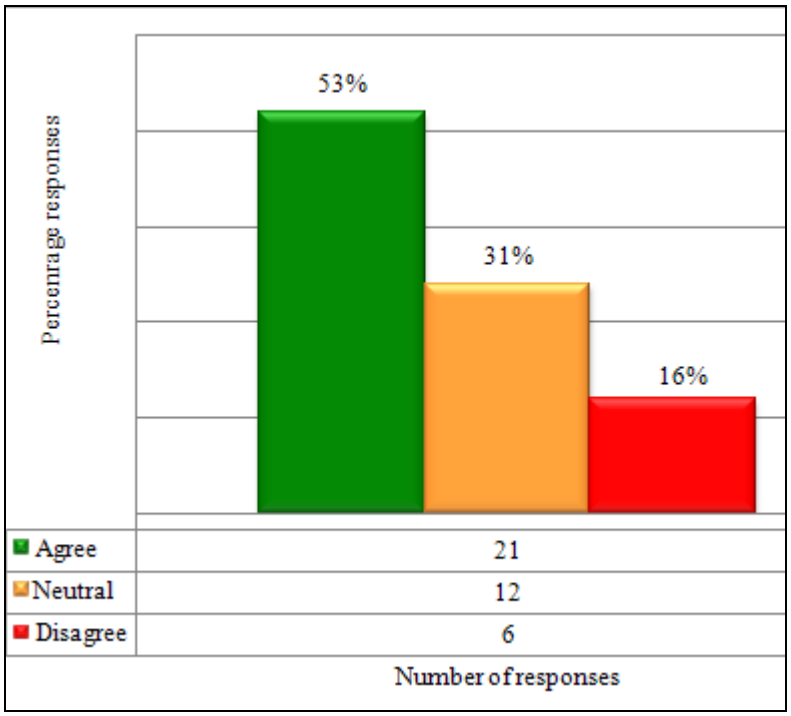


Staff development	2.54
Plans for developing staff expertise	2.69
Succession planning is in place	3.26
Training always takes place when there are new tools in use, or when the existing tools are changing	2.74
There are mentoring incentives	3.18

4.2.6.3 Regular assessment of practices

One of the practices that were in place at MCNY was regular performance evaluation. This entailed the periodic revision of one's job description, comparing it with performance, and scores awarded by the supervisor. Among the respondents, 21 (53%) agreed that it was in place, 12 (31%) gave a non-committal response, while 6 (16%) indicated that there was no regular performance appraisal. These perceptions are demonstrated in Figure 64.

Figure 64: The existence of regular performance appraisal of employees



A rating average of 2.49 indicates that most of the respondents agreed, but with a tendency for others to also not give an opinion with regard to the existence of regular performance appraisal of employees.

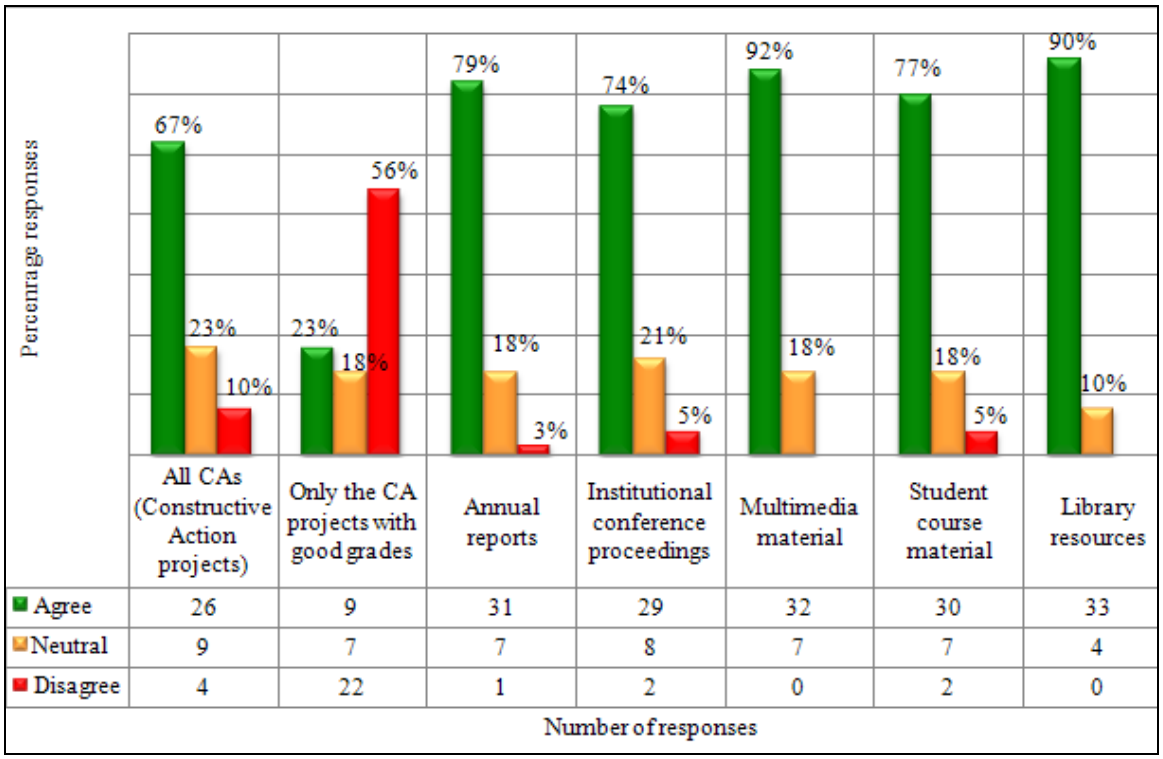
4.2.7 Knowledge organization

It is important that any organizational knowledge be accessible and available whenever needed (Gregory, 2000). For this to happen, it has to be organized. In the case of MCNY, the researcher was finding out what information and knowledge resources needed to be organized for the retention of OM. Materials involved included students' Constructive Action (CA) documents, library material, and other College documents.

In this question, 26 (67%) agreed that all CA projects needed to be included in a repository, while 9 (23%) used the non-committal option, and 4 (10%) disagreed. A majoriry of 22 (56%) respondents disagreed with the suggestion to include only those CAs with good grades, while 7 (18%) gave no opinion, and 9 (23%) agreed. There were 31 (79%) respondents who agreed that annual reports of the College needed to be in such a repository, while 7 (18%) gave a non-committal response, and 1 (3%) disagreed.

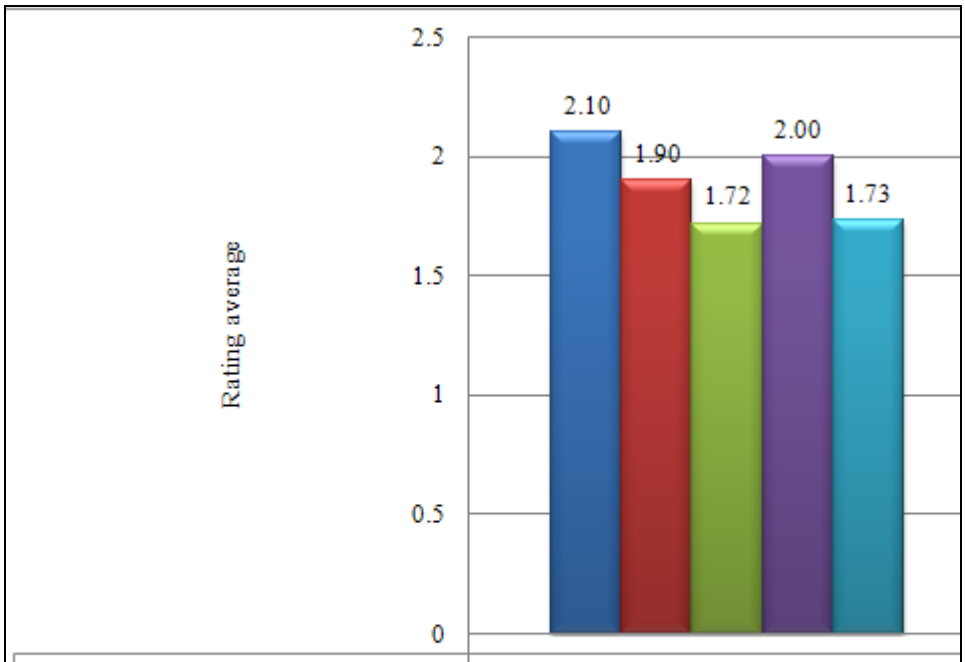
In addition, 29 (74%) respondents agreed that institutional conference proceedings had to be included in a repository, while 8 (21%) gave no opinion and 2 (5%) disagreed. There were 32 (92%) respondents who agreed that including multimedia material in a repository was essential, while 7 (18%) gave a non-committal response. Regarding the suggestion to add student course material to a repository, 30 (77%) respondents agreed with that, while 7 (18%) gave no opinion, and 2 (5%) disagreed. Another 33 (90%) respondents agreed that library resources needed to be part of a repository, while 4 (10%) gave a non-committal response. The meaning of this is that at the time of this study, such a central space did not exist at MCNY. These perceptions are demonstrated in Figure 65.

Figure 65: Material for inclusion and organizing in a suggested MCNY repository



A rating average of 2.10 reflects the prevalence of the respondents' choice to agree to the suggestion to include all CA (Constructive Action projects) in a repository. With regard to only the CA projects with good grades being considered for inclusion in a repository, a rating average of 3.45 reflects that the majority of the respondents did no agree with that suggestion. Rating averages of 1.79, 1.90, 1.72, 2.00, and 1.73 reflect that most respondents were agreed about the importance of including annual reports, institutional conference proceedings, multimedia material, student course material, and library resources in a repository respectively. These perceptions are demonstrated in Figure 66.

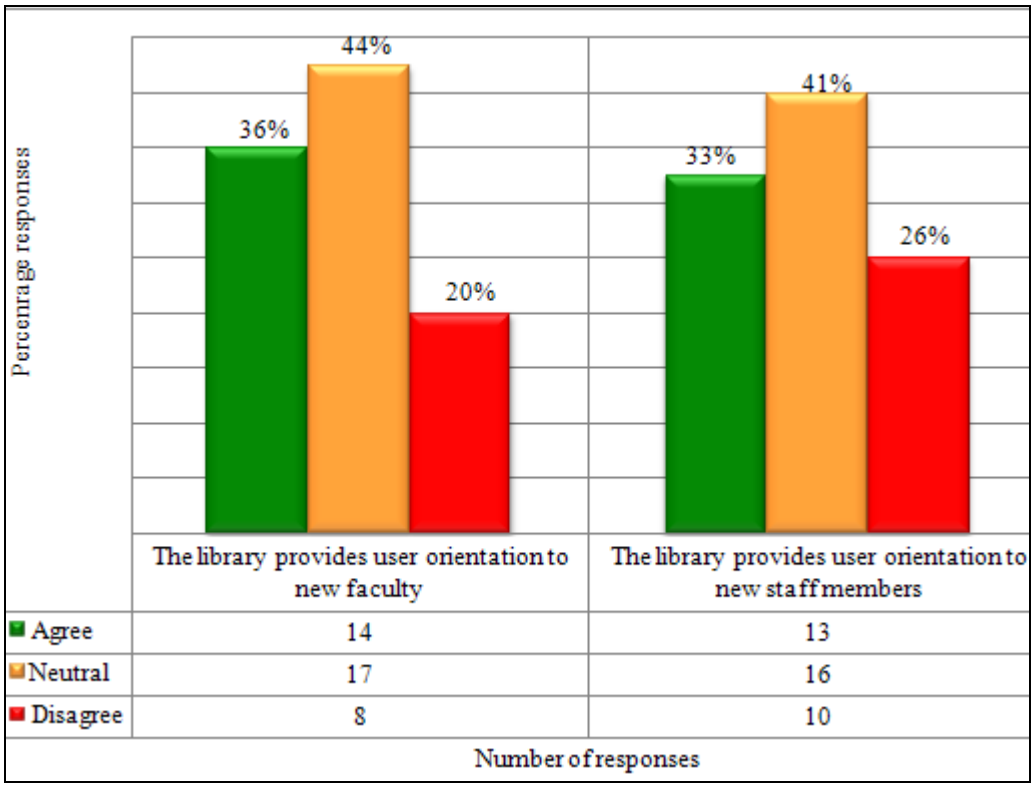
Figure 66: Material for inclusion and organizing in a suggested MCNY repository (rating averages)



All CAs (Constructive Action projects)	2.10
Institutional conference proceedings	1.90
Multimedia material	1.72
Student course material	2.00
Library resources	1.73

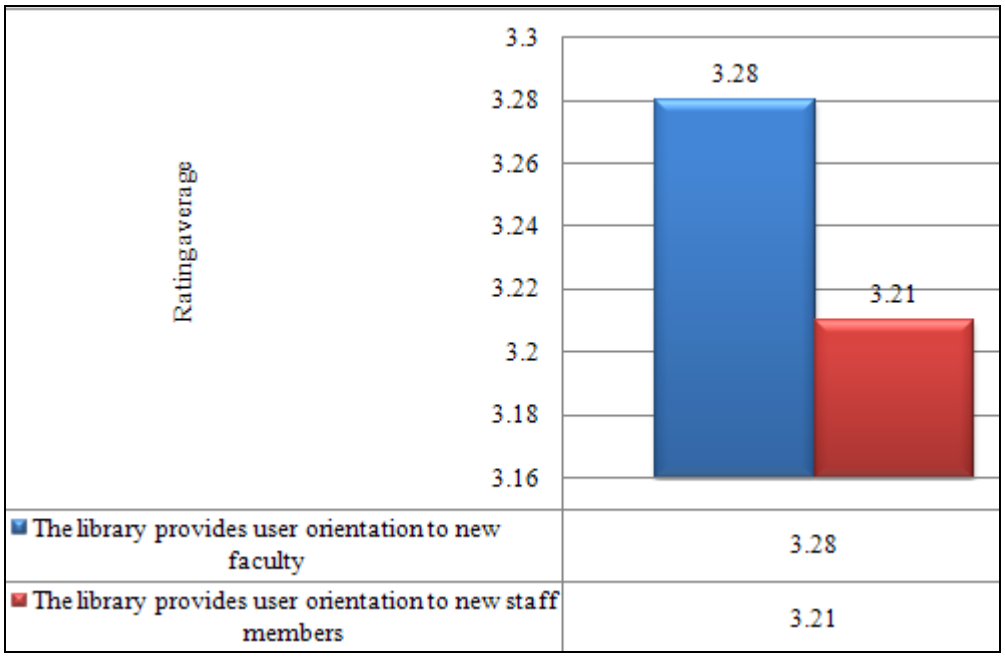
Besides suggestions on what the library needed to keep, there was also the question about what the library needed to do to make an impact beyond its current position. The question of what the library was currently doing was included and 14 (36%) respondents agreed that the library was providing orientation to new faculty, while 17 (44%) gave no opinion about that, and 8 (20%) disagreed. As far as the library providing orientation service to new staff members was concerned, 13 (33%) agreed that it did, while 16 (41%) gave a non-committal response, and 10 (26%) disagreed. This is demonstrated in Figure 67.

Figure 67: MCNY library service to the employee community



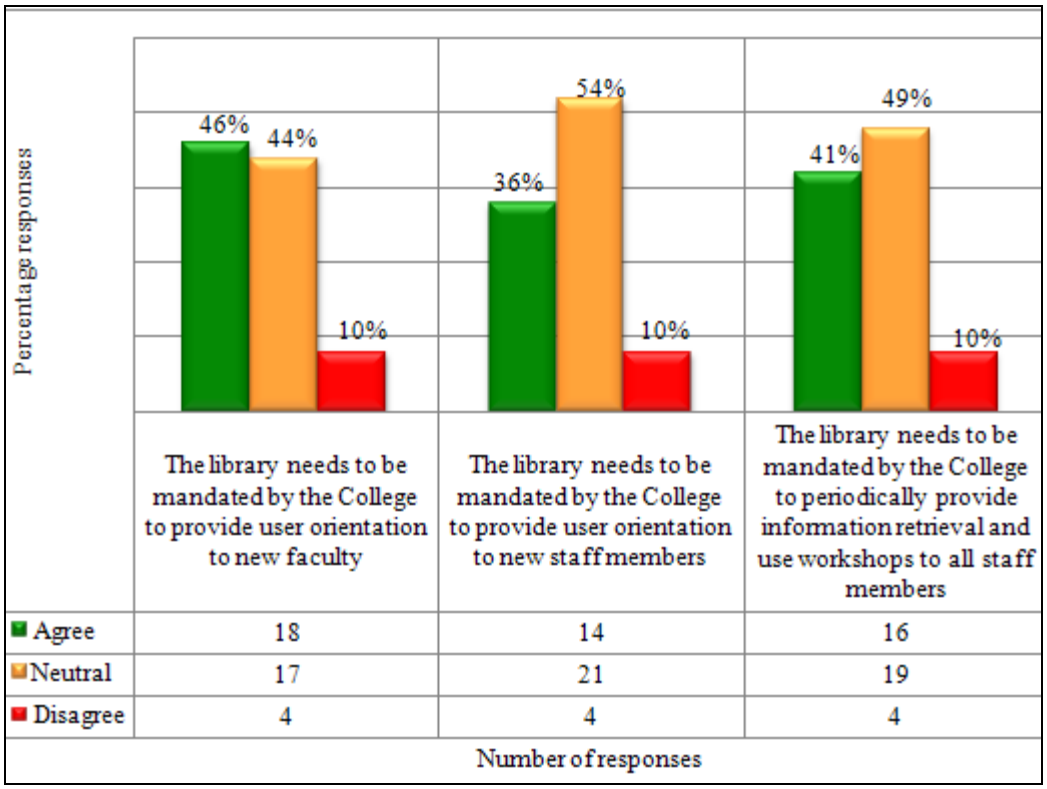
A choice of the non-committal position was popular with regard to the perception that the MCNY library provided user orientation to new faculty, and to new staff members as reflected by rating averages of 3.28 and 3.21 respectively, although the affirmative option was also prevalent. These rating averages are reflected in Figure 68.

Figure 68: MCNY library service to the employee community (rating averages)



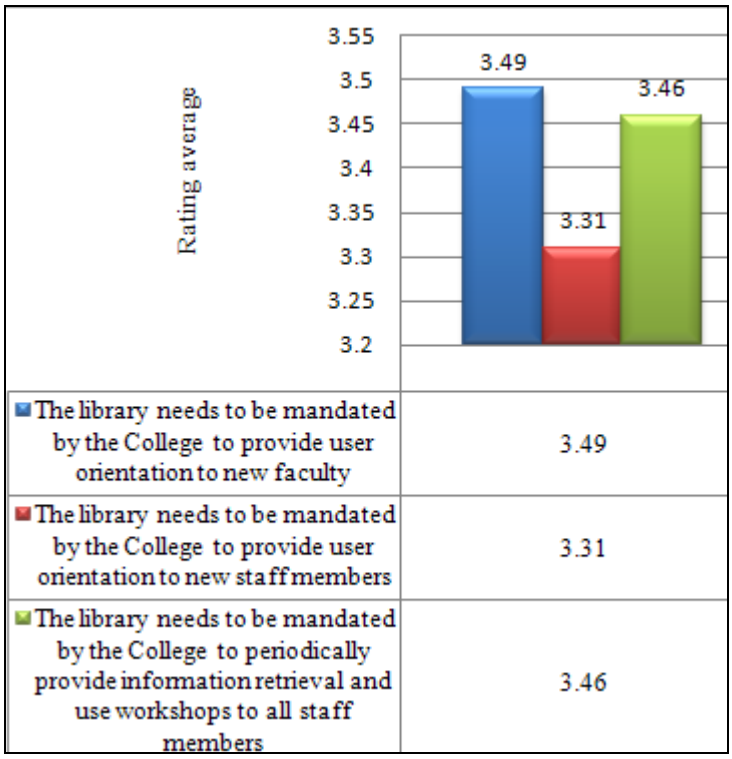
If information literacy was an important factor in KM practice, then a credit worthy information literacy class for students could be effective if faculty and librarians collaborated in providing it (Branin, 2003; Lloyd, 2003). Giving the library the mandate to enable it to provide information literacy as embedded in the teaching curriculum was considered following the suggestions of Kifer (2005), Pantry and Griffiths (2003), and Rowley (2003). Indeed, 18 (46%) of respondents agreed that the library needed to be mandated to provide user orientation sessions to new faculty, while 17 (44%) did not give an opinion about this idea, and 4 (10%) disagreed. Additionally, 14 (36%) respondents agreed that the library needed to be mandated to provide user orientation to new staff members, but 21 (54%) did not give an opinion about this approach, while 4 (10%) disagreed. Another 16 (41%) agreed that the library needed to be mandated by the College to provide user education workshops to all staff members, but 19 (48%) gave a non-committal response while 4 (10%) disagreed. These perceptions are reflected in Figure 69.

Figure 69: Mandate of the MCNY library



The rating averages of 3.49, 3.31, and 3.46 reflect a choice of the non-committal position by respondents with regard to the MCNY library being mandated by the College to provide user orientation to new faculty, new staff members, and to provide them with periodic information retrieval workshops respectively. However, in this instance, the affirmative position was also used substantially. These perceptions are demonstrated in Figure 70.

Figure 70: Mandate of the MCNY library (rating averages)

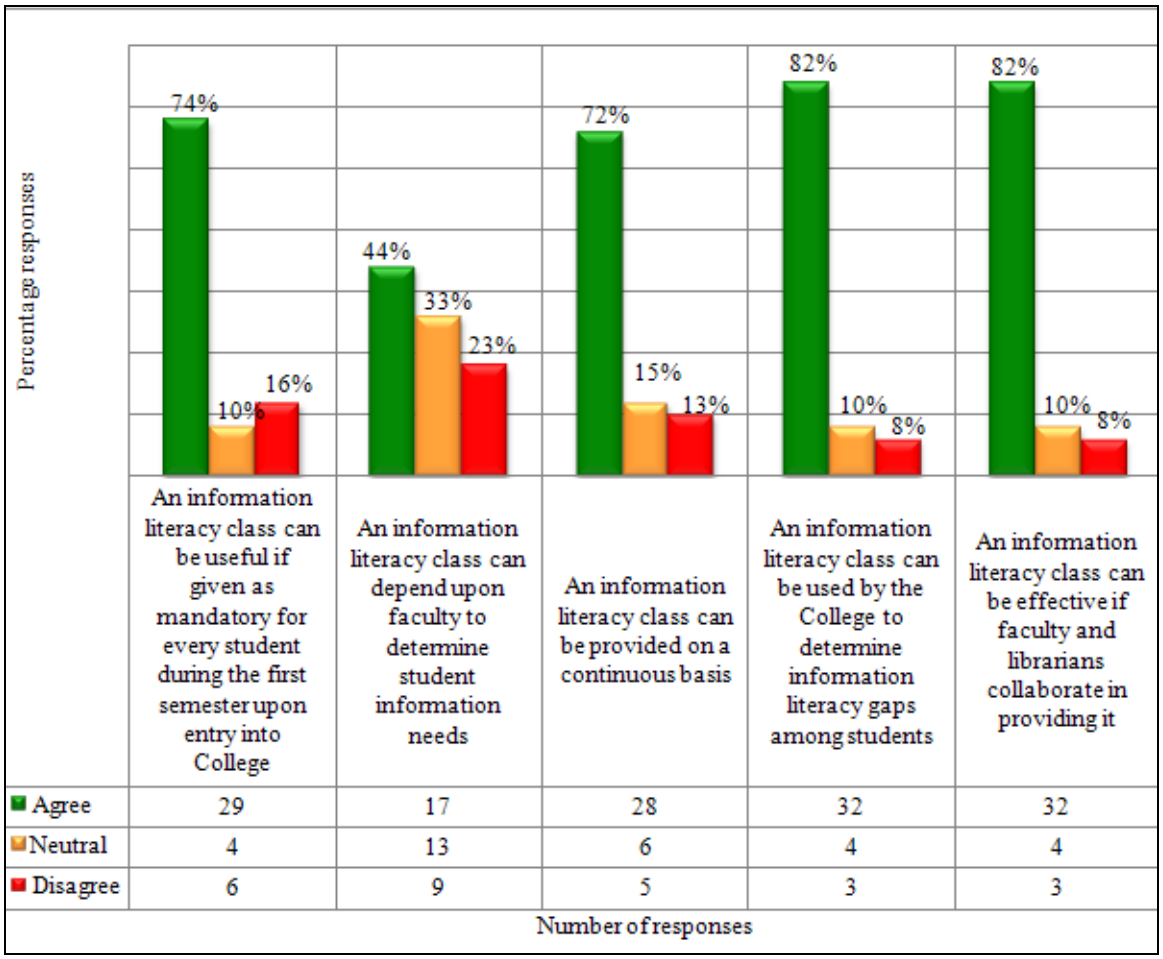


To fulfil the requirements of the ACRL information literacy standards for higher education, librarians and faculty need to collaborate (Association of College and Research Libraries, 2001). The reason is that it is difficult to teach information literacy independent of the teaching curriculum. To the question of a credited information literacy class being useful if given as mandatory for every student during the first semester upon entry into College, 29 (74%) of the questionnaire respondents agreed, while 4 (10%) gave no opinion, and 6 (16%) disagreed. In regard to whether a credited information literacy class can depend upon faculty to determine student information needs, 17 (44%) respondents agreed while 13 (33%) gave a non-committal response, and 9 (23%) disagreed.

The provision of a credited information literacy class to the College on a continuous basis had 28 (72%) respondents agreeing, 6 (15%) not giving an opinion, and 5 (13%) disagreeing. Concerning whether a credited information literacy class could be used by

the College to determine information literacy gaps among students, 32 (82%) respondents agreed, and 4 (10%) gave a non-committal response, while 3 (8%) disagreed. To the question of providing information literacy being effective if faculty and librarians collaborated in providing it, 32 (82%) respondents agreed, and 4 (10%) gave no opinion while 3 (8%) disagreed. Figure 71 demonstrates the perceptions of the MCNY employee community about making information literacy a mandatory course worthy of some credits to the students.

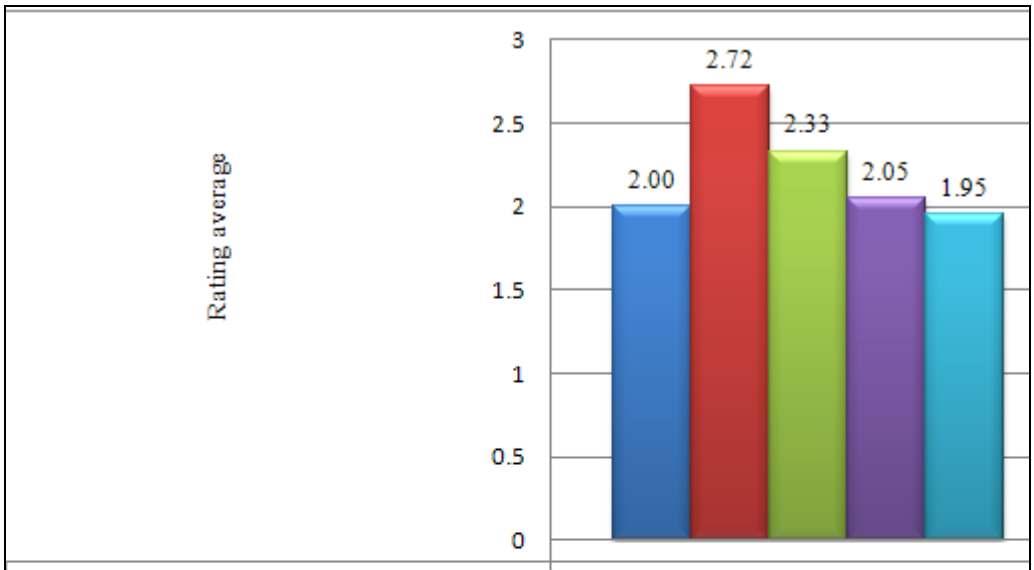
Figure 71: The relevance of a credited information literacy class for students



A rating average of 2.00 reflects that respondents strongly agreed, with others agreeing with the suggestion that an information literacy class could be useful if given as mandatory for every student during the first semester upon entry into College. Rating

averages of 2.72, 2.33, 2.05, and 1.95 reflect most respondents agreed about the possibility of an information literacy class depending upon faculty to determine student information needs, the continuous provision of an information literacy class, the suggestion that an information literacy class could be used by the College to determine information literacy gaps among students, and the suggestion that an information literacy class could be effective if faculty and librarians collaborated in providing it respectively. These rating averages are demonstrated in Figure 72.

Figure 72: The relevance of a credited information literacy class for students (rating averages)



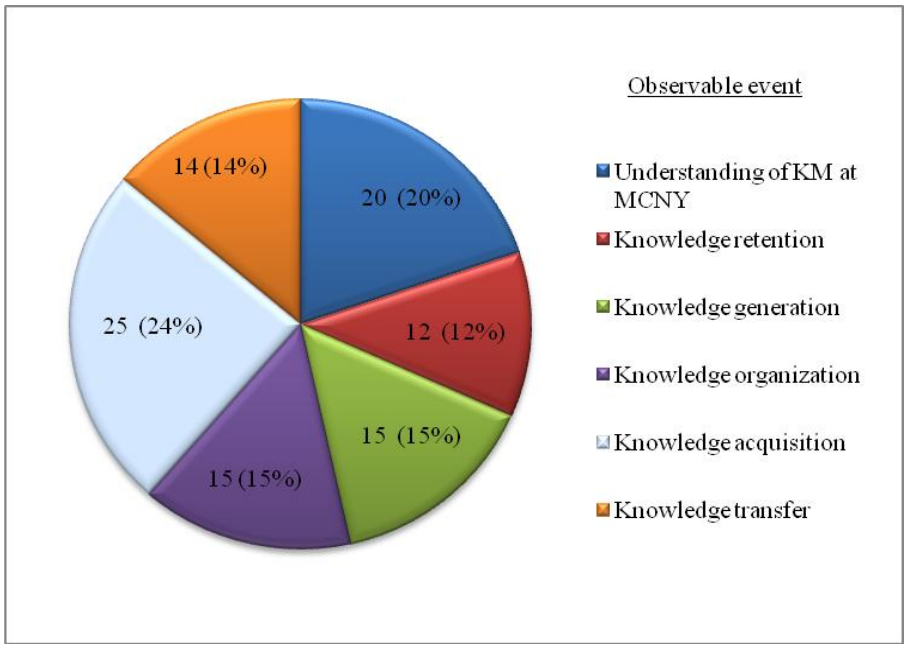
An information literacy class can be useful if given as mandatory for every student during the first semester upon entry into College	2.00
An information literacy class can depend upon faculty to determine student information needs	2.72
An information literacy class can be provided on a continuous basis	2.33
An information literacy class can be used by the College to determine information literacy gaps among students	2.05
An information literacy class can be effective if faculty and librarians collaborate in providing it	1.95

4.3 Structured Observation

Structured observations results were obtained from using the observation protocol (see Appendix H) for 22 days of one-hour sessions of observation during the time that interviews and questionnaire data collection was also happening in order to view the situation from different times of the day and of the week. The events observed were categorized according to the issues raised in the research questions of this study.

Using a checklist of practices that the researcher understood to mean KM practice, it was possible to record whether or not a given behaviour or act occurred. The desired behaviours were clearly defined so that there was no question to the researcher/ observer as to whether or not they occurred. The fieldwork involved counting how many times a particular behaviour occurred. There were 20 (20%) events that could be categorized as reflecting an understanding of KM, 12 (12%) as knowledge retention, 15 (15%) as knowledge generation, 15 (15%) as knowledge organization, 25 (24%) as knowledge acquisition and 14 (14%) as knowledge transfer. This is what Figure 73 depicts.

Figure 73: Frequencies and percentages of each category of observable knowledge management behaviours



The observation data were about subjects and events observed, therefore could not be regarded as a random sample representative of the entire College. However, the use of structured interviews, institutional documents, and a questionnaire complemented the data gathering. In this section, data were presented in the context of KM, on aspects of the work of library staff, on their specialized knowledge, and on their attitudes towards the organizational climate. There was observation of the general operational processes in the library to show the processes into which knowledge generation, organization, sharing and transfer, and retention could fit. The findings on KM practices and on the use of official and personal information resources were presented.

4.3.1 Understanding of knowledge management at MCNY

The daily results did not vary much over the 22 sessions of observation. Library use patterns were very similar from one day to the next. In terms of understanding of KM concepts by both library staff and faculty, there did not seem to be consistency. Concepts like knowledge creation through socialisation, externalisation, combination, and internalisation that originate from the work of Nonaka and Takeuchi (1995) were articulated differently by library staff, depending on the responsibilities of the individual in question.

It was observed that sometimes library staff members were overwhelmed by congestion in the library. The result was to occasionally have a number of unhappy users. This was due to the expectation by various faculty members to have students complete certain tasks all at once, therefore expecting library staff to be available to resolve student queries readily. The demand on library resources therefore became very high all at once, but that could be circumvented if course expectations of the library and deadlines for course assignments were synchronized. This was observed in 20 (20%) instances during observation sessions. Out of the 20, 10 (50%) of them happened in the late afternoon/ evening sessions, while 8 (40%) happened on Saturdays mid-morning. The knowledge needs of the MCNY library, from an observational perspective, were therefore to do with

the ability to anticipate user needs at different times of the year and day by varying user groups within the MCNY community.

It was observed as a characteristic of the library working environment that there was trust, and that encouraged knowledge sharing. This was viewed as healthy for purposes of anticipating problem areas, and thus minimising the likelihood of crises. The library was staffed by 7 full-time staff as well as by work-study students. There was a tendency for students to occasionally forget that when they were on duty, they temporarily forfeited their student role and became library staff. As such, their behaviour and attitude was expected to portray the library correctly. This was not always the case as illustrated by a lack of initiative in learning to use databases effectively so that they could quickly know when to pass on reference questions to the reference librarian. This was noted on 2 (10%) occasions when this category of employees exhibited a lack of knowledge about proper procedure. Thus, as far as understanding KM concepts was concerned, some effort needed to be made in re-orienting staff as appropriate.

4.3.2 Knowledge retention

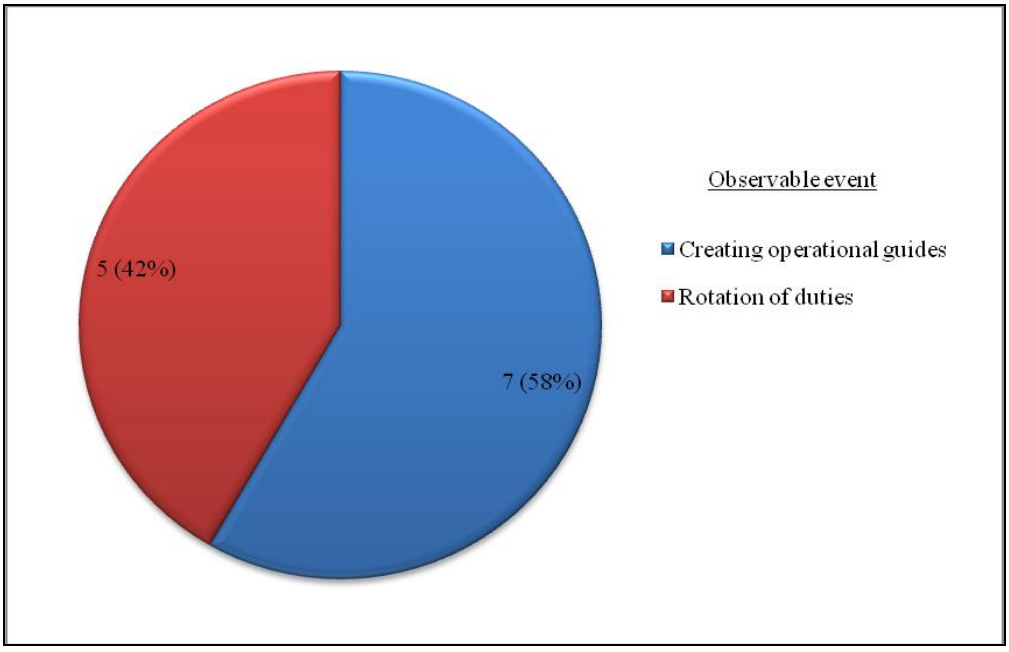
Use of library guides that were created towards more effective library service was necessary. This was to improve the transfer of explicit knowledge because knowledge retention does not mean holding on to knowledge or information. It actually involves sharing it (Lee, 2005; Singh, 2007; Skyrme, 2004). During the times that observation was going on, there were 12 (12%) specific events that amounted to knowledge retention. These included the fact that in 7 (58%) out of the twelve events, each member of library staff was encouraged to create a guide for the duties they did so that if they were not at work, the person who had to perform the responsibilities had the necessary guide.

The events involving the creation of guides could be regarded as a knowledge creation and retention practice. The process was similar to harvesting knowledge for purposes of enriching the operation of the library. However, some of the guides needed constant updating as library software was changing fast. The ILS circulation interface was a case

in point. Even if the same vendor as some two years previously was still providing the library a service, software updates required a number of changes, and in turn that necessitated regular re-training of library staff.

In 5 (42%) out of the twelve events, there was partial rotation of duties. This meant that, as an example, the technical services librarian would be at the circulation desk, while some circulation desk staff would be inserting security tags on library books. This was intended, not only to share duties, but also to enable individuals to manage functions even in times of short absences. These knowledge retention events are demonstrated in Figure 74.

Figure 74: Observable knowledge retention related events and products



4.3.3 Knowledge transfer/ sharing

During all the observation sessions, 14 (14%) events were categorized as knowledge transfer. These were mostly based on communication and sharing of ideas. There was encouragement of library staff to initiate ideas. It was also observed that changes in the

working schedule of library staff were always made in such a manner that there would be no gaps in library service. Communication about schedule changes was always by electronic mail to make sure that everyone had the message. Of the fourteen events, 8 (57%) instances involved such electronic mail messages during the observation sessions.

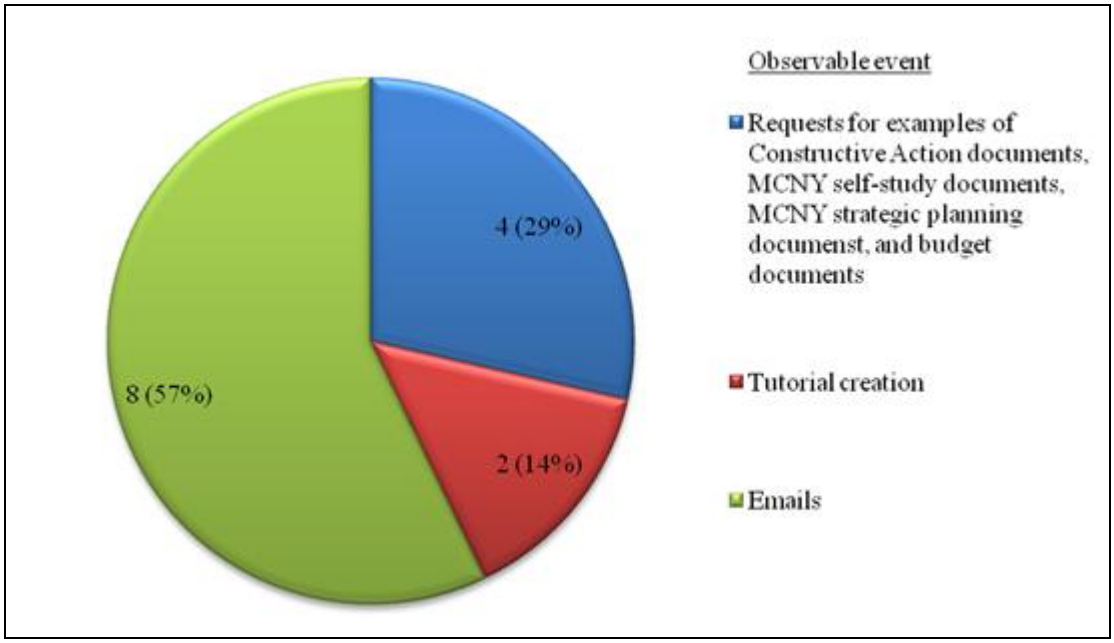
Additionally, it was observed that an open and rigorous dialogue among library staff existed, and it was possible to speak one's mind respectfully and openly without fear of reprimand. Observations also revealed that some of the common communication channels in the library included face-to-face conversations inclusive of meetings, and gatherings, written-documents such as memos, procedures manuals, telephone, a wiki and a blog. Through observations, it was found that the library was electronically well networked and that had the potential to facilitate the processes of transferring knowledge, while enhancing the ability of the staff to communicate with each another, though its ILS system was stand alone and unconnected to any other in the College. The need for knowledge transfer at MCNY was reflected by the 4 (29%) requests for such material as samples of CAs, the MCNY self-study documents, MCNY strategic planning documents, and budget documents. These documents existed but not in a centralized or accessible place.

Among all the observed events categorised as knowledge transfer, 8 (57%) involved reference to some form of published or written information. An attempt was made to identify the subject matter of written electronic mail communications but messages, memoranda, agendas and minutes did not lend themselves to ready categorization and unless they related to schedule changes, they were not included, but acknowledged as an information transfer process. The majority of these kinds of written information could be classified as procedural, implying that the library paid great attention to the following of procedures.

An important observation was that the library link was available inside both Blackboard and Moodle, the course management systems in use at MCNY, to make it possible for library users to visit the library website and online resources more easily. The library was

able to create tutorials inside these systems, but the process was in its formative stages as reflected by 2 (14%) tutorials created at the observation times of this study. However, one may consider this approach to be an effort at using modern technology to enhance the environment favourable to KM practice in the transfer of knowledge. These events are illustrated in Figure 75.

Figure 75: Observable knowledge transfer events



4.3.4 Knowledge generation/ creation

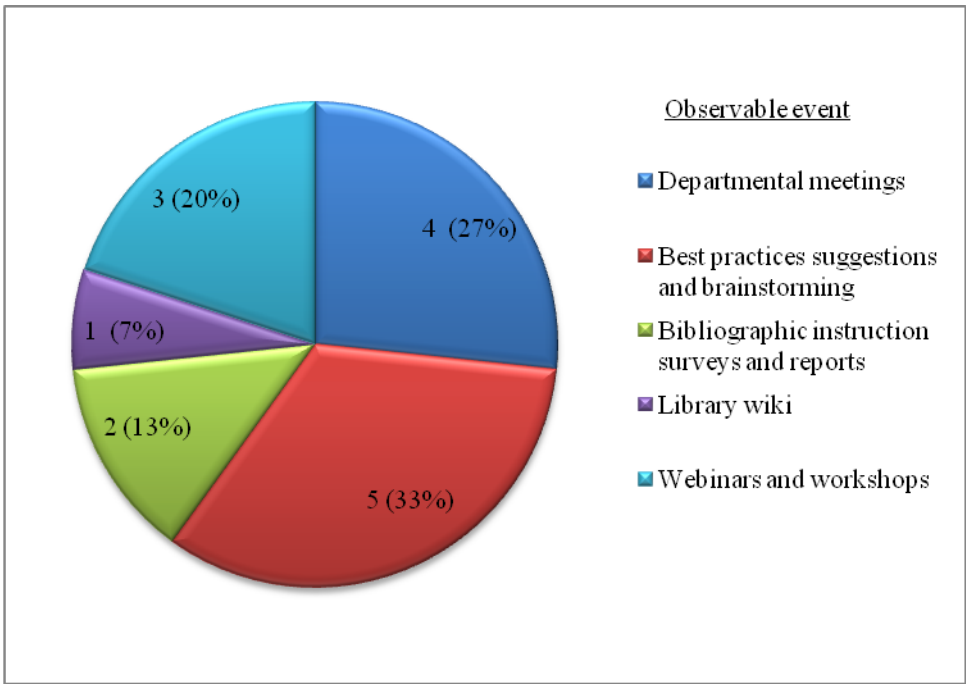
Knowledge generation could be effective if knowledge assessment was conducted in order to determine the extent of an organization's effective use of its knowledge assets. The value of these assets would be based on investment in employee training and experience and the out-datedness of their knowledge if it is not refreshed. Following the suggestion of Daud, Rahim and Alimun (2008), the processes of articulating knowledge from tacit to explicit was triggered by dialogue, formal meetings, brainstorming, and team work, documenting ideas, and organizing information for re-use. The tasks of

different individuals also determined the appropriateness of having brainstorming sessions.

During the observation sessions, there were 15 (15%) specific events that could be categorized as knowledge generation practices. The realization of value of staff training was evidenced particularly in the MCNY library by exposure to 3 (20%) webinars that the library director encouraged staff to participate in during this study, and with plans for continued exposure to such opportunities. This appeared to be an effort at enabling the generation of more knowledge for the library by and for library staff.

This observational phase of the investigation showed that there were 2 (13%) bibliographic instruction survey events, 4 (27%) instances of meetings, and 5 (33%) instances of best practices suggestions within the library at the time of the observation stage. The amount of time spent in meetings varied with the work role. The higher in the organizational hierarchy, the more the time spend in meetings than those lower in the hierarchy, including those in/ with other departments within the College. Meetings were seen by many as an important vehicle for obtaining information. To indicate its usefulness to library users, the library wiki was used by 1 (7%) individual. The mentioned activities indicated a potential for knowledge generation. The knowledge generation events are demonstrated in Figure 76.

Figure 76: Observable knowledge generation events

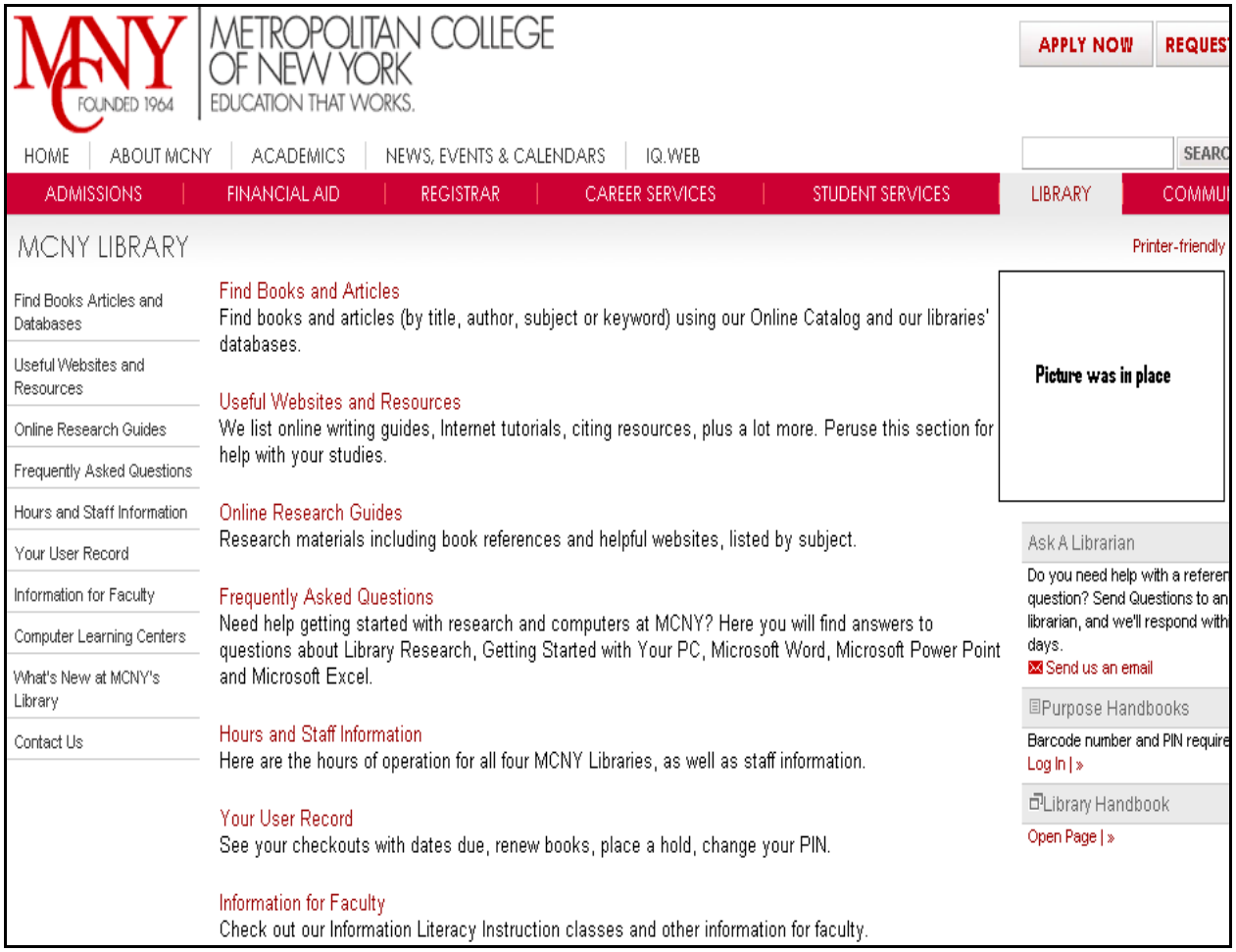


Besides knowledge generation, its acquisition was regarded as crucial to the KM process. This refers to how and where it was acquired from.

4.3.5 Knowledge acquisition

During observation sessions, a total of 25 (24%) specific events were categorized as knowledge acquisition. These were most involving interaction with library users. The culture of the library was to recognize and make use of available expertise at MCNY. This facilitated the updating of the library website, and its continued improvement. While this study was going on, there were 8 (31%) events that involved the library website content changes and improvements. These involved the library collaborating with the MCNY webmaster towards the complete transformation of the library homepage. The transformation is demonstrated in Figures 77 and 78.

Figure 77: Original library homepage (before October 2009)



The original website was static, but the current one has a banner that is easily manipulated to include events that are happening in the library, or offered by the library. The original one was also proving to be difficult to use because of the change in expectations of modern information users who are prone to use more visual and interactive platforms. Those are the characteristics of the revised website, Figure 78, which was in use at the time of this study. This effort required team effort especially in an environment of scarcity of personnel.

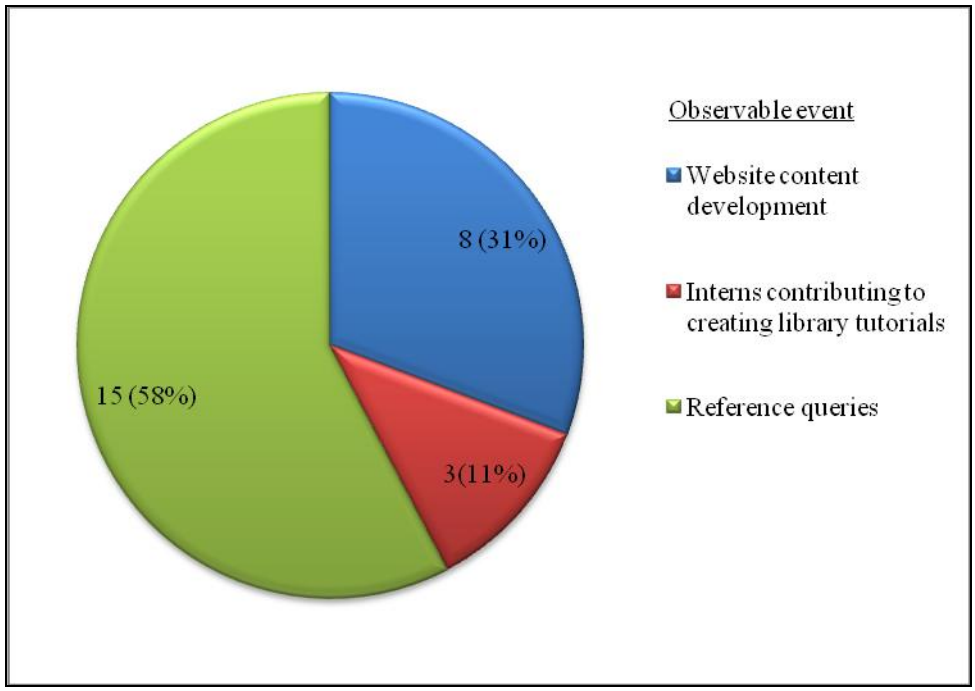
Figure 78: Revised library homepage (launched October 2009)

Besides updating and changing the content of the website, 3 (11%) events involving the input of a library science student intern were included particularly in the creation of tutorials for posting on the website. The library intern was from a library science school in New York and would be making contributions as part of library practical experience before completion of studies. These contributions were valuable especially as the library was making an effort to reach out to modern library student users. The recognition of individuals for their intellectual, professional, and practical effort was a favourable attribute in an environment for knowledge acquisition in KM practice.

There were 15 (58%) reference queries during observation times. One of the reasons for this high number was that the observations were taking place inside the library and the

researcher attended to reference queries as they came. These ranged from questions relating to the use of printers to database searching. These events and questions were categorised as knowledge acquisition because they gave insight into how to enhance service. They are tabulated in Figure 79

Figure 79: Observable knowledge acquisition events



The website of the library was transformed from one that users found confusing to a conventional one that provided more information with fewer words. In that sense, library staff organized some of the knowledge at MCNY.

4.3.6 Knowledge organization

There were 15 (15%) specific events that warranted categorization as knowledge organization during the observation sessions. Among these, 8 (50%) of the instances involved the classification of library material for inclusion at the reserve desk. The MCNY library was cataloguing with the use of WebDewey. WebDewey includes a suite of cataloguing and metadata services in classifying library material, using the Library of

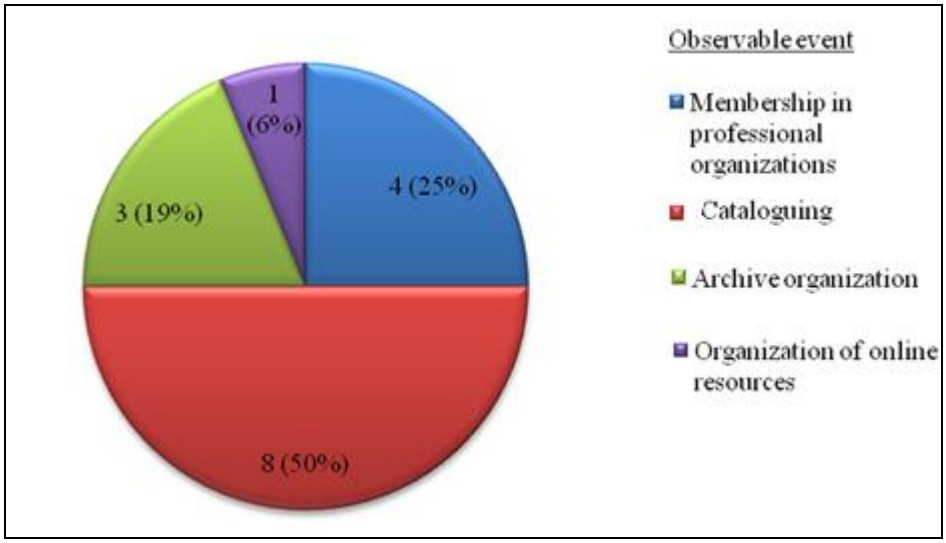
Congress Classification system. The use of WebDewey enabled interlinking between classification numbers, the alphabetical index of the tables and Library of Congress Subject Headings. This ability to work without special effort on the part of the librarians or library users between subject headings and the classification system while supporting hyper textual navigation structures was a feature of KM practice. There were also 3 (19%) instances of the addition of documents to a MCNY archive folder, which formed part of the knowledge organization process.

To be assured that the library organized material by internationally recognized standards, it was, and remains, a member of 4 (25%) professional groups, such as the Metropolitan New York Library Council (METRO), NyLink (an organization of libraries and cultural heritage organizations throughout New York State and surrounding areas that facilitated collaboration and cooperation among its members, and supported access to cost-effective resources that enabled member institutions to enhance the services they provided to their constituents), the Association of College and Research Libraries (ACRL), and the American Library Association (ALA). All these organizations also helped keep librarians updated about changes and trends in the profession, besides providing training possibilities and opportunities. That encouraged knowledge networking, that is, people enriching the knowledge asset through collaborative practices.

At the time of this study, MCNY had opted to use online access for all the journal titles it subscribed to. The planned activation of an article linker (a computer programme that enables library users to connect to all the licensed full text journals and magazines that MCNY subscribed to), was to make searching of databases easier. This was categorised as 1(6%) event in knowledge organization. The journals were searchable through databases including EBSCOhost, Eric, JSTOR, SAGE, WilsonWeb, Gale, Access Science, and ProQuest. To expand the library book collection, it subscribed to Net library and to ebrary, the databases of online books that gave access to ±40 000 books in a variety of subject areas, but full-text access was possible from links directed by catalogue results. This way, the library collected, managed and disseminated information, creating a

bridge between intellectual properties, people, and information resources. These events are highlighted in Figure 80.

Figure 80: Observable knowledge organization events



The organization of online resources became necessary because of the realization that library users may have been getting confused with searching for information from the different databases that the library subscribed to. This was even more so with the ILS operating separately from any other MCNY database.

Database usage statistics indicated that library database usage ranged from very low to inconsistent. This is demonstrated in Table 10 which shows the trend in the use of WilsonWeb, ebrary, and EBSCOhost from September to November 2009, that the researcher used as examples. The decision to use statistics of that period originated from the fact that the data collection period was in November 2009. However, the database usage statistics would make sense only if a comparison was made. Thus, the semester during which the study was going on was perceived as relevant. The comparison was done with statistics for unique documents retrieved (full-text and abstracts). Usage statistics were compared to the numbers of students enrolled at MCNY at each point.

Observing the WilsonWeb retrievals shows that it was used more in 2008 with an average of 11 retrieved documents per student than in 2007 and 2009. The pattern with ebrary usage did not change for the period observed, with 1 retrieval in each period covered. However, there was an increase in the use of EBSCOhost from 2007 to 2009 with an average of 7 retrievals in 2007, 11 in 2008, and 10 in 2009. There may be many explanations for that pattern, but subscribing to these expensive databases was believed to be cost effective if they were used more extensively.

Table 10: Database usage statistics: average number of unique documents retrieved per student

WilsonWeb	**2007 (987 students)**	**retrievals/ student**	**2008 (930 students)**	**retrievals/ student**	**2009 (1082 students)**	**retrievals/ student**
September-November	5665	6	9976	11	926	1
Ebrary	**2007**		**2008**		**2009**	
September-November	507	1	224	1	290	1
EBSCOhost	**2007**		**2008**		**2009**	
September-November	6929	7	10558	11	10465	10

Reflective notes based on a rating scale (1 being least prevalent and 5 being most prevalent) were used to demonstrate prevalence of phenomena, or lack of them. The structured observation results are summarized in Table 11.

Table 11: Structured observation results

Descriptive notes: activity/ situation observed	**Reflective notes based on rating scale (1 being least prevalent and 5 being most prevalent)**	**Prevalence**
Understanding of KM by library staff and by faculty	Some observed behaviours were not consistent with KM culture and that also determined the way that faculty	4

	members and library staff interacted.	
The staffing situation of the library	Library staff was sometimes edgy because of congestion in the library.	2
Whether there was encouragement of library staff to initiate ideas	Each member of library staff was encouraged to create a guide for the duties they do so that if they were not at work, the person who had to perform the responsibilities was informed	5
Whether there was an observable environment of trust that encourages knowledge sharing	Library staff shared their experiences so that they could anticipate problem areas	4
Whether knowledge sharing was encouraged/ rewarded	Knowledge sharing was encouraged	4
Whether there have been knowledge initiatives in the library	Knowledge initiatives were visible from the identification of experts that the library can work with in the improvement of the library website	4
If there was observable management support and resources to the library	Institutional management support was in the form of IT personnel taking care of computer problems that the library experienced	3
If library staff were amenable to helping each other to learn new ways of giving library service	The library director always encouraged staff to help each other to learn new ways of giving library service	5
Whether it was acceptable to speak one's mind respectfully and openly	It was always acceptable to speak one's mind respectfully and openly because that opened up avenues for developing new ideas	5
Networking with other libraries, or belonging to library consortia	METRO Council, NyLink, ACRL; use of WebDewey.	5
Recognizing and making use of available expertise at MCNY	Part-time volunteer contributed to library tutorials and her ideas were considered seriously; webmaster consulted on issues	4
The kinds of materials kept in the library	The library housed books on open stacks, had a reserve collection, had reference books, and subscribed to an online database of full-text books (ebrary).	4
Databases	Databases excited students and faculty who learned to use them, especially when they realized that they could use them remotely too. Article linker activation. Independent ILS.	4

The library website	Faculty did not seem to be aware of links that were available to them. Website was updated.	4
Communication between librarians and faculty	Faculty sometimes made e-mail requests for information literacy classes.	3
The technology available in the library	The library had 40 computer workstations available for the use of everyone who visited the library, and wireless network. Library users could also print for no charge.	4
Library building	The library building is on the 12th floor, facing the Hudson River.	5

4.4 Qualitative findings

To gain more in-depth understanding of the context of KM at MCNY, face-to-face interviews (see Appendix G) were conducted and institutional documents were examined. These efforts produced important qualitative data to arrive at qualitative results.

4.5 Institutional documents

To determine the need for KM practices in the library one had to know what knowledge assets existed and bring out the gaps so as to find a solution that best fitted the working environment of MCNY. Knowledge assets were found in places like databases, filing cabinets and peoples' heads. The institutional documents studied included the library handbook, the library annual report of 2009, the internal MCNY Self-Study of 2009, and the MCNY archive for the origins of the library.

4.5.1 Knowledge retention

The process of keeping useful knowledge inside the College and avoiding its loss was its retention, or the building of organizational memory (OM). The fact that there were institutional documents that the researcher used for the purposes of this study meant that MCNY kept some of its knowledge assets. The library handbook revealed that the library supported the mission of the College, “to provide a superior, experientially-based

education that fosters personal and professional development, promotes social justice, and encourages positive change in workplaces and communities" (MCNY, 2009a), while operating within the guidelines of the ALA and the ACRL. The Association of College and Research Libraries (2010) strategic plan 2020 envisioned an environment where higher education institutions recognized their librarians as authorities on KM. Thus, the intention to have MCNY librarians who were capable of fitting into that role was implied by adhering to the ACRL plan.

Reading the historical development of the College brought out the fact that the library started as a small collection of book volumes in a corridor, but had now moved with the times and provided online access to more resources (not just books only) than are physically housed in it. The MCNY library was subscribing to 39 831 e-books, 42 919 e-journal titles, and 26 online databases (MCNY, 2009b). This indicated that the work of librarians has had to change too to effectively serve the users. The library annual report also mentioned that "all staff members receive additional training/professional development throughout the year, as well as assist in training other staff members including work-study students" (MCNY, 2009b: 3). This practice enhanced the knowledge base of the library.

From institutional documents readily available, the researcher found that KM awareness was lacking as there did not appear to be a documented inventory of the College's skills base, or evident records of succession planning, even if the library annual report suggested that there were career development practices (MCNY, 2009b). In other words, it appeared that there was a limited knowledge retention culture in the library and at MCNY. This would have made it possible to anticipate remedial action if there was a threat of loss of staff – and their tacit knowledge.

4.5.2 Knowledge transfer/ sharing

From the presence of an MCNY account on iTunes U, MCNY blogs, MCNY social networking with the use of Facebook, Twitter, and YouTube, it was evident that MCNY

encouraged information flow and use of modern technologies such as the freely available Web 2.0 tools. In that environment, the library was also creating podcasts and tutorials for inclusion in the iTunes account in order to reach out to as many users as opened the MCNY account. This was an effort by the library to encourage the use of library resources for knowledge transfer/ sharing.

4.5.3 Knowledge acquisition

Library staff was exposed to regular webinars in order to acquire as much new knowledge as possible. However, for the most part, they were not supposed to be at a cost to the library. Consequently, some relevant opportunities could have been lost due to cost cutting. At the same time, knowledge, if considered as a part of knowledge assessment, its purpose would be for nurturing the knowledge asset. That involved the development and evaluation of staff. That way it could be used to assess the readiness of the library and the College for the knowledge economy and could have College policy uses because once instituted, it would be possible to apply to all departments.

From reading the mentioned MCNY documents, it was not clear if the management of MCNY formally considered knowledge as a strategic asset. The library's mission statement stipulated that: "The library is designed to support the Purposes and curriculum of Metropolitan College of New York through traditional and online resources. It also supports the research and related needs of all College faculty, staff, and alumni" (MCNY, 2009a). Thus, the library operated within the scope of the goals of the MCNY.

The KM concept did not feature in the College's educational philosophy. However, the College's self-study of 2009 revealed that KM principles were in fact the basis for some activities. Examples included the fact that the College continued to seek the right balance between "innovation and stability when it comes to faculty recruitment" (MCNY Self – Study, 2009: 56); and also the concept of faculty participating in the governance of the College implied collaborator activities. From this information, the library became

relevant in support of research and scholarship that could result in innovative ways of teaching and research at MCNY.

4.5.4 Knowledge organization

In the context of MCNY, the information provision practices at MCNY included the existence of an archive that contained historical documents about MCNY. These were partially indexed, rendering the retrieval of un-indexed information very complicated. There was a printed index of those few documents and artefacts that were indexed. The existence of that archive signified that the concept of KM might possibly be understood at MCNY, but it was not clear yet how to put the practices into use. Another archive housed in filing cabinets was also stored in the library. Some of the documents that it contained had digital versions. This instance reflected a vague place of the library in relation to managing the knowledge assets of MCNY.

At the time of the research, the library did not keep student Constructive Action (CA) projects because it was not required to, and there was no centralised place that one could retrieve papers presented at conferences or published by MCNY faculty. This had the potential of inhibiting knowledge sharing or transfer and knowledge retention. This seemed like a contradiction in intentions since knowledge generation was encouraged at MCNY by the College's requirement to have every student produce a CA project, and the appreciation expressed when faculty published scholarly articles. This requirement was coupled with the expectation from the College for the library to give information search instruction and support to users, but with no organized place for the resultant publications.

4.6 Interviews

A structured interview protocol (see Appendix G) with open-ended questions was used in this study, based on the research questions. The researcher explained to the participants the aim of the interviews, before the actual interviews. Participants were given the option

to determine the venue that they were most comfortable in. Out of the 5 interviews, one was held in the researcher's office, while the rest were in the respondents' offices.

All interviews were not audio-tapped but responses were manually recorded. The names, positions or other personal details of participants were not recorded in order to assure, maintain and respect their anonymity. Additionally, none were quoted or identified specifically with any responses. The researcher used only the ideas and opinions they expressed. The interview responses were used to better explore nuances in some of the patterns unfolding in the closed-ended data in the questionnaire. Recording of interviews would have provided exact responses and opinions of participants, but would still have entailed the researcher interpreting the recordings. Interview results were expressed in the sections that follow.

4.6.1 Characteristics of interviewees

Interview participants were key individuals from the administrative, full-time faculty, part-time faculty, and full-time non-administrative staff categories. Their years of MCNY service varied as illustrated in Table 12.

Table 12: Interview respondents by years of service.

Years of service	**Frequency**	**Percent**
Less than 1 year	1	20
Between 1 and 3 years	1 1	20 20
Between 3 and 5 years	1	20
More than 5 years	1	20
Total	**5**	**100**

4.6.2 Understanding of knowledge management principles

Respondents representing the managerial level were among those who were clear about the distinction between knowledge and information, as well as between KM and information management. One individual expressed that:

> *KM has the undertones of censorship, control of knowledge and information, and knowledge is used for competitive advantage. As such, it would benefit MCNY to practice KM because it is important to be ahead of competing Colleges, particularly in relation to the student enrolment and retention questions.*

4.6.3 Knowledge retention

Knowledge retention is a field that focuses on the capture of "workplace wisdom" (Prewitt, 2003) and provides mechanisms for sharing it. This practice could reduce the learning curve of new or incoming employees. Knowledge becomes manageable, shareable, and reusable only if it is recorded and made available. Interviewees expressed that they recorded their experiences but that was for their own benefit, or for the benefit of the educational or work-related programmes they were involved with. However one sentiment was that:

> *The library could play a major part in the knowledge retention processes since that is one of most central departments of the College, and it already has staff members that have the capabilities for organizing and managing knowledge.*

Most probably there were other knowledge retention activities that existed in the College that the interviews failed to capture but all the given information showed that a knowledge retention and use climate existed but needed to be developed further.

Each interviewee had a lot of files with information related to their job functions. It was noted, for example, that:

handbooks need to be archived since they indicate what the students and the College have agreed to

and

there is no obvious list of Constructive Action projects at the moment and that makes it difficult to study the trend of education at MCNY

and

there should be a central place where procedures are kept so that they can be shared, particularly as MCNY has so many adjunct faculty, additionally, it is difficult to capture the knowledge of those that do not stay for long at the College if what they are doing is not stored in a central location, preferably online for easy access.

There were also indications that employees were aware that their IT platform was available for use, but shared only the information that was relevant to their situations. This was the reason generally expressed why they could not understand the lack of a central place for all MCNY knowledge, that is, they all believed that different access rights could be set if there was a place with such knowledge.

There were suggestions about what should be retained by the College. In this area, copyright concerns were expressed. An example was the fact that:

If the College starts collecting and managing a database of CAs, students should know about this in advance; standards for CAs should be clear; maybe the problem of plagiarism could go down if anyone writing a CA knows that it will be accessible to other people to read.

There was also the perception that the library was the most central department to initiate knowledge capture and storage from. When asked whether IT was the best information storage utility for knowledge acquisition and sharing, four respondents agreed with the statement. The researcher considered this sentiment as normal since most people tended

to think that technology was the answer, rather than an enabler, to managing knowledge in some organizations.

4.6.4 Knowledge transfer/ sharing

All the interviewees agreed with the view that individuals shared limited amounts of knowledge or information on what was going on with each other in their respective divisions, but not across departments. One interviewee suggested:

synergy and standardisation in the teaching activities at MCNY

while another felt that departments needed to be

more interrelated than they currently are

Effective KM requires a knowledge sharing culture to be successful. Organizational culture is a set of values, beliefs, assumptions and attitudes that are deeply held by the people in an organization (Baskerville and Dulipovici, 2006; Lloria, 2008; Vasconcelos, 2008). According to interview responses, this did not seem to be a major characteristic of how MCNY employees worked.

Respondents were asked about how they shared knowledge or information on what was going on with each other in their respective divisions. Their responses showed that they did not necessarily share information or knowledge with each other, and much less across departments. There was the feeling that:

information dissemination is not efficient within and among departments

Explanations from interviewees were that this was for the most part because their academic/ professional interests had nothing in common, and they had essentially no need to be sharing any information. However, the common technology infrastructure

offered by the school formed a good basis for any communication necessary to be easy when it needed to take place. It appeared, therefore, that the problem was not so much the technology infrastructure as the culture within the College that was in question. The interviewees also agreed that the 2009 MCNY Self-Study reflected an orientation by the College towards improving technology.

The internet was viewed as the most used system at MCNY and had the potential for extensive knowledge sharing possibilities. All 5 respondents interviewed indicated that they used the internet to retrieve and transfer information. The second most preferred database in the library was the Online Public Access Catalogue (OPAC) where all respondents used it as a means of retrieving information probably while satisfying their information needs. E-mail, which is an accepted KM enabler, was also frequently used by all respondents as a means of transferring information.

Interviewees were not sure of the MCNY information sharing policies. There was the sentiment from one participant that in the College:

> *knowledge is not always shared openly*

There were also mixed perceptions about the positive attributes or privacy of the MCNY communication system. They felt that this may have influenced the decisions people made when it came to open communication, and the ways in which they behaved. One of the practices expressed in an interview was the need to create:

> *strategic alliances as a way of exchanging information and knowledge*

There was the view that although there is no ideal culture that can fit all organizations, there were certain values that must be honoured in a culture if its members are to feel:

> *free and motivated to share what they know and to collaborate around their shared knowledge*

This is in line with the conclusions of Barquin (2001), Weddell (2008), Wen (2005), and Sharma and Chowdhury (2007) who all suggest that incentives are important in encouraging employees to contribute towards KM practice.

A good communication flow within the organization was also viewed as potentially facilitating the ease of managing knowledge. A suggestion that came out of this topic was that it was:

> *essential to avoid or reduce hostilities in order to deal with situations in a manner that would be effective.*

This point coincided with the idea expressed by all participants that communication and collaboration was a central part to KM practice. One suggestion was to use:

> *reflective thinking technique by individuals as a way of discovering what practices work and which ones do not work as all employees aim to fulfil the goals of the College.*

Interviewees felt that MCNY, by being an academic institution, was a suitable environment for knowledge innovation. Since some of the interviewees did not work in the library, it was important to know their perceptions about how knowledgeable or innovative librarians seemed to them. They all felt that the librarians had done their best to serve them when they needed support. While some interview participants were of the impression that there was good communication in the library, others felt that there was a:

> *a high tolerance for disruptive behaviour, noise, and misuse of library facilities; additionally, there is an inherent culture of not respecting the library.*

However, there was also the comment that people in the College normally gave a helping hand to their colleagues.

Through interviews, it was realized that processes and work at MCNY required inputs from more than one individual and that in order to perform to the best of their ability, these individuals needed to work as teams or groups. This statement was supported by the sentiments expressed by interview participants that the December 4 2009 symposium would be likely to pave a way for the start of a working culture where knowledge would be shared openly. The common view expressed by three interviewees was that experience gained in that exercise would be useful in any knowledge assessment process that the College would want to put in place.

All the interviewees were comfortable using the technology available to them in the College, although there was the sentiment from three participants that some of the technology and applications needed upgrading. An example was with:

> *the use of Microsoft Office 2003 on some computers, and Microsoft Office 2007 on others can be very frustrating*

That type of example implied the need for standardisation in applications used in the College. It also touched on the need to check on the appropriateness and effectiveness of applications to convey messages that were related to their media richness, especially with the potential use of Web 2.0 tools.

Interviewees indicated that the library was the place where knowledge presentation or transfer had the potential to effectively happen because all members of MCNY visited it at some point or other. Although IT training was not provided in formal ways, the sentiment expressed was that academic staff was encouraged to familiarize and promote the usage of the facilities provided. There was no indication that the College sent employees for IT training to enhance the use of the knowledge tools. However, some interviewees confirmed that they were aware that the library provided regular workshops and guides that included MS-PowerPoint 2003/ 2007, MS-Word 2003/ 2007, MS Access 2003/ 2007, and Excel 2003/ 2007. Although this was not the core business of the library, the fact that it was the only service place that was available to users who either

taught or attended classes in the evenings made it necessary to provide those classes, thereby enabling the use of technology for knowledge transfer. The practice was in line with the suggestion that an enabling environment could allow for the capture, storage, and easy retrieval of information and knowledge (Özdemir, 2010).

4.6.5 Knowledge generation/ creation

All interviewees suggested that they had no problems with group cooperation if the need arose. They all expressed that if cooperation was required, it was likely to be for the benefit of making the teaching goals of the College easier, therefore they had no problems with it. They were of the opinion that effective teams or group work accomplished most of the important work in organizations and that strong relationships usually developed in project teams or groups assigned with an organizational task. One respondent felt that:

> *there is a lot of knowledge sharing and collaboration with my departmental colleagues to generate knowledge*

These relationships were easy to overlook, yet they were part of the crucial component of knowledge creation in an organization, and the same perception was also suggested by Kulkarni, Ravindran and Freeze (2006). All interviewees expressed the fact that while working in teams, an individual staff member had the opportunity to learn precisely how the knowledge of colleagues can help solve a problem, and in the process come up with new solutions for issues relating to job performance. The implication of this attitude was that, if formalised, faculty was willing to work with the library as well as with any other department as appropriate.

What came out in all interviews was that if knowledge was to be consciously managed in an organization, it was very important to have a KM policy that would be well understood by all employees. This was in line with the suggestions made by Jain (2007), Singh (2007), Skyrme (2007), and Stankosky (2005) who all mentioned the importance

of putting policy in place that would have a systemic impact in an organization. Having a well defined College-wide KM policy was suggested as possibly capable of helping the College store and access the right information and knowledge for the benefit of staff and the College, and probably create new knowledge. This was seen as having the potential to help employees become aware of what kind of knowledge needed to be acquired, managed, and shared.

All interviewees agreed that the College should define and document the organization's policy for KM making it known to all staff or personnel, if KM practice was the route the College considered and decided to take. Some suggestions were that:

rules and policies need to be in place and enforced

and

administrative structures are essential for KM practice

This reinforced the view that the support from the managerial level is essential to KM programs if they are to produce meaningful results.

The use of one of the most valuable assets in the College – the employees - was considered as important in knowledge generation. According to Singh (2007) and Skyrme (2004), employees are the intellectual asset of an organization. In this respect, the researcher asked participants if succession planning was in place as a way of reducing the negative impact of staff-turnover by capturing people's knowledge during their employment. Four participants described the College as lacking in succession planning. To describe it in relation to the library, one interviewee expressed the fact that:

succession planning is non-existent in the library but the library continues to exist

To find out if MCNY encouraged employees in creating knowledge, the researcher asked if there was a rewards system in place. Respondents suggested a desire for rewards that

included such special assignments as organizing workshops or symposia, receiving recognition or commendations such as the College did when employees achieved or attained certain qualifications or positions, getting time away from work, having more training opportunities, receiving a bonus cheque at the end of the year whenever the College finances permitted, celebrating employee success, having time to do academic research and publishing. Interviewees also noted that there was no obvious reward system in the library, though that did not mean it was not in place. In fact one interviewee expressed that:

> *Rewards were useful only where appropriate.*

There was also the desire to get regular increments in income as rewards.

4.6.6 Knowledge organization

When an organization regards and uses knowledge as an asset, then it is a knowledge organization (Rowley, 2001). The implication of regarding itself as a knowledge organization is for it to take an audit of its culture and values so as to create an enabling environment (Jantz, 2001; Sharma and Chowdhury, 2007; Srikantaiah and Koenig, 2000). In so doing, organizing the knowledge is a part of necessary practice. In the words of one interviewee:

> *Knowledge organization is the responsibility of the library.*

One participant expressed that the practice of document description, indexing and classification performed in the library was an example of how the library kept knowledge organized.

4.7 Summary

This chapter dealt with the presentation of the data collected from the different categories of employees at the Metropolitan College of New York. A summary of the major findings was organized according to the themes raised by the research questions of the study. The results emanated from the whole College and the library, and reflected questionnaire, interview, observation, and document review findings.

In reporting the questionnaire findings, the use of SurveyMonkey enabled the demonstration of rating averages that were calculated by the survey tool. In each instance, this was the sum total of all the ratings made, divided by the total number of ratings. In other words, it was the weighted average per column and row. That made it possible to report whether responses reflected or were "strongly agree", "agree", "neutral", "disagree" or "strongly disagree" positions. Structured observation results were presented in tables that demonstrated the existence or absence of events categorized as KM practice. A similar approach of following the sequence of research questions focusing on KM practice in getting data from institutional documents and from interviews was used. They were in a sequence that answered the research questions rather than the order in which responses were given. Whenever appropriate, the actual words of interview participants were used to emphasize or express certain ideas as they were said. A summary of the findings from all the data collection tools are as methods.

4.7.1 Librarians, faculty, and administrators and their understanding of knowledge management

- From questionnaire responses and interviews, the managerial levels clearly understood KM concepts; and
- there were "neutral" responses that indicated that some employees were not sure about the differences in meanings.

4.7.2 The knowledge needs of the MCNY community

- there were no KM practice guides mentioned in institutional records, interviews, or observed;
- there were limited guidelines for the identification MCNY archival records, but an up-to-date catalogue of library material was used to retrieve library documents;
- interviewees indicated that they were not aware of a records inventory covering documents that were not directly related to their job functions;
- the library used steel cabinets to store a small number of College records, but the rest of the archives were in another location;
- determining what storage space to use was cited in two interviews as a major problem faced in storing College documents; and
- questionnaire respondents and interviewees indicated the absence of an organized records centre for storage of all College records resulting to the scatter of records in the departments and that made it difficult to retrieve them.

4.7.3 Knowledge retention policies, practices and gaps in existence at MCNY

- all questionnaire respondents and interviewees showed the existence of computers in their offices and workspaces, and observations indicated this;
- all employees had an mail address for business communication;
- there were procedures manuals observed in the library;
- passwords were used to ensure security access of private and unpublished institutional documents;
- some questionnaire respondents faced challenges including limited computer skills, capturing data, difficulties in coping with changing technology and preservation of data;
- the College had not taken any survey to determine the amount of records created in the College; and
- the desire was expressed in interviews to develop a programme for managing all records.

4.7.4 Modern technologies and practices in use at MCNY and the library that enhance the environment for knowledge management practice

- the library assigned experienced individuals to the student interns and work study to help them find their way in the duties assigned;
- the library extracted the experiences of its experts and shared them to improve its service;
- employees in the College shared their knowledge/ know-how with colleagues and others in limited ways;
- the knowledge in the College was sometimes distributed in informal ways;
- the knowledge in the College was distributed in formal ways;
- the library held regular update meetings to discuss ILS development and procedural issues;
- the employees of the College regularly informed each other about positive experiences and successful work methods;
- librarians regularly attended webinars in which they were free to discuss their methods of working;
- librarians rotated duties on a limited scale in order to distribute their know-how; and
- librarians were available to provide information literacy and library orientation classes as a means for knowledge exchange across individuals in the various organizational levels.

4.7.5 Tools, methods and techniques used for knowledge assessment and knowledge acquisition at the MCNY library

- MCNY employees actively participated in professional networks or associations;
- the library regularly collected information about the needs of its users;
- the library sometimes conducted knowledge gap analyses especially as relevant to ACRL information literacy standards;

- MCNY usually hired consultants when important skills/information were not available in-house;
- the library made use of student interns from library schools in New York, and they possessed new knowledge about modern library trends;
- employees at MCNY regularly attended courses, seminars, or other training programs to remain informed;
- MCNY appeared to consider competitors as a source of inspiration for developing new methods of service provision;
- the library regularly used brainstorming sessions for problem solving;
- MCNY evaluated failures and successes and "lesson learned" were set down at performance evaluation times;
- the library had available up-to-date handbooks and guides which were frequently used;
- library employees were always informed of changes in the procedures' handbook;
- the library had documented the specific knowledge and skills of its individual members;
- the library was a member of professional associations, and library staff were encouraged to benefit from the career development opportunities offered such as through webinars, seminars, and workshops; and
- the library used the services of library graduate school interns to benefit from their current knowledge of library trends and practices.

4.7.6 Tools, methods and techniques used for knowledge transfer at the MCNY library

- problems, failures, and doubts were discussed openly in the library;
- new ideas led to re-design of work methods and processes in the library;
- members were assigned to new projects depending on know-how and availability;
- the library endeavoured to find knowledge combinations that contributed to its identity;

- employees at MCNY were sometimes rewarded for developing new knowledge and testing new ideas;
- the library promoted and encouraged a learning climate among employees;
- MCNY contributed to the development of the important ideas and knowledge in the education field;
- the library used the knowledge and experience of experts from other departments, for example, collaboration with the webmaster to make content changes to the library website; and
- library staff regularly shared their knowledge amongst themselves.

Chapter Five interprets the data that were presented in this chapter. The main trends and patterns in the data were discussed with reference to the research questions outlined in section 1.4 of Chapter One.

CHAPTER FIVE: ANALYSIS AND INTERPRETATION OF RESULTS

In order to begin an analysis, there must already be a synthesis present in the mind

Johan Huizinga (1872–1945)

5.0 Introduction

In this chapter, the data presented in Chapter Four were discussed. It was proposed in the literature review in Chapter Two that instead of sticking to the traditional role of selecting, collecting, and acquisitions of books and materials, the library has now expanded its scope to include the generation, capturing, organizing, and retention of knowledge. At the start of the study, it was obscure what knowledge should be considered as at-risk and worth capturing in an academic library. Having an answer to this question could add value to the status of the library.

The analysis and interpretation of the results in this chapter were guided by themes from the findings that were based on the research questions aimed at investigating:

- what librarians, faculty, and administrators understood KM to mean;
- the knowledge needs of the MCNY community;
- the knowledge retention policies, practices and gaps in existence at MCNY;
- the modern technologies in use at MCNY that could enhance the environment for KM practice;
- the tools, methods and techniques used for knowledge retention-- knowledge generation, knowledge acquisition and knowledge transfer at the MCNY library; and
- the recommendations on implementing KM practices that could enhance the value of library service at MCNY.

According to Wilkinson (2000: 77), "the role of analysis is to bring data together in a meaningful way and enable us as researchers to interpret or make sense of it".

An MCNY library related framework was used so that the results could provide direction in the way that an action research agenda can benefit from. In a case study, at the phase of data analysis, emphasis is on internal validity which is established through pattern matching, explanation building, and addressing rival explanations (Yin, 2003). Pattern-matching refers to a situation where several pieces of information may be related to some theoretical proposition (Yin, 1984). This may be regarded as a strategy for the data correlation stage of the mixed methods data analysis (Greene, 2008). Explanation-building is a form of pattern-matching, in which the analysis of the case study is carried out by building an explanation of the case (Tellis, 1997a). Thus, case study concerns are subsumed in mixed methods data analysis. Additionally, in enhancing the internal validity of a case study, it is important to show:

> that all relevant evidence was used, that all rival explanations were used, that the analysis addressed the most significant aspect of the case study, and that the researchers knowledge and experience are used to maximum advantage in the study (Tellis, 1997a).

Wolcott (1994) restricted analysis to the procedure of identifying essential features and relationships. Miles and Huberman (1994:16) defined data analysis as three linked sub-processes: data reduction, data display, and conclusion drawing. While data analysis may mean data handling, it can also be regarded as categorizing and interpreting data (Gubrium and Holstein, 2001). “The data must speak for themselves” (Leedy and Ormrod, 2010: 296).

5.1 Data analysis

In handling mixed methods data analysis, this chapter incorporated data correlation, consolidation, comparison, and integration stages as suggested by Greene (2007), Onwuegbuzie and Teddlie (2002) as well as by Creswell and Plano Clark (2007). After data were cleaned, that is, “reviewed for valid responses, methodological soundness, and indicators of variability and range” (Greene, 2007: 144), they were reduced to more descriptive information.

Following the triangulation design model of Creswell and Plano Clark (2007), data integration included both the qualitative and the quantitative data that were collected. According to Bazeley (2009), integration during analyses is the key to unfolding the complex relationships in the topic of study. Woolley (2009: 7) suggests that:

> Quantitative and qualitative components can be considered ‘‘integrated’’ to the extent that these components are explicitly related to each other within a single study and in such a way as to be mutually illuminating, thereby producing findings that are greater than the sum of parts.

In this study, the integration of different forms of data meant that the analysis consolidated the findings (Greene, 2007). According to Greene (2007: 146), “consolidation is a form of transformation” because of the fact that qualitative data has to be transformed into qualitative, or vice versa in mixed methods data analysis. This is what Onwuegbuzie and Teddlie (2002: 357) referred to as “qualitizing and/ or quantitizing data” and “correlating quantitative data with qualitized data”. Caracelli and Greene (1993: 197) suggest that:

> one means by which qualitative and quantitative data can be integrated during analysis is to transform one data type into the other to allow for both statistical and thematic analysis of both data types.

While transformed quantitative and qualitative data were integrated and compared, Onwuegbuzie and Leech (2006) emphasize the importance of linking research questions to data analysis in order for the results to make sense.

5.1.1 Data correlation

When making multiple measurements of one object at the same time, it is useful to correlate those measurements (Leedy and Ormrod, 2005; Onwuegbuzie and Teddlie, 2002). In this case study, the object was the MCNY and its library, analysing data that were collected qualitatively and quantitatively. According to Leedy and Ormrod (2005: 180):

> a correlational study examines the extent to which differences in one characteristic or variable are related to differences in one or more other characteristics or variables. A correlation exists if, when one variable increases, another variable increases or decreases in a somewhat predictable fashion.

Although this was not a strictly correlational study, observations revealed that the more library administration encouraged staff to make suggestions openly, the more the staff were willing to make meaningful contributions. This was corroborated by the response from Figure 40 that reflected 17 (44%) of the questionnaire respondents having the perception that when colleagues asked for information, it was essential for business; and 20 (52%) feeling that the information requested from them was important for creative work. The responses were mostly in the affirmative and non-committal categories as reflected by the rating averages of 3.13 and 3.33 respectively. These feelings of making useful contributions seemed to be present if individuals felt that their input made a positive difference. However, in this case the data did not indicate that the positive feelings or the encouragement given by administrators necessarily caused individuals to make the valuable contributions. This is in line with the point raised by Leedy and Ormrod (2010: 275) that "correlation does not necessarily indicate causation". This validates the point raised by Rowley (2002) in section 3.3.3 of Chapter Three that internal validity is not relevant for exploratory studies, which the current study is, although construct validity remains important.

Another instance of direct correlation was observed in questionnaire responses, College documents, and interviews to be the fact that the higher the administrative position of an individual, the clearer their understanding of KM was. Questionnaire results suggested that all administrative category staff disagreed with the view that knowledge and information have the same meaning, and all of them agreed that KM includes information management. This was corroborated in institutional documents which showed that the MCNY administrators made sure that the College met the accreditation standards and was accredited by the Middle States Commission on Higher Education (MSCHE). MSCHE guidelines intended for institutional improvement included information literacy

in the curriculum and defining what information literacy is – information literacy being an essential competency in a knowledge and information led environment. This did not mean that staff from all the other categories had no understanding of what KM involved. Results showed that the responses from their categories were not as unanimous as were those from the administrative category.

5.1.2 Data consolidation

Consolidation of data happens when there are multiple sources of data, and the data has to be merged into one system to produce meaningful results (Creswell and Plano Clark, 2007; Greene, 2007; Onwuegbuzie and Teddlie, 2002). Given that the data in this study came from the questionnaire, the structured observation, institutional documents, and interviews, it was important to consolidate them if meaningful interpretations were to be made. However, while consolidating data from multiple sources, one had to be aware of the fact that triangulation or cross-checking often, "results in convergent, inconsistent, and contradictory evidence that must be rendered sensible by the researcher or evaluator" (Mathison, 1988: 13).

5.1.2.1 Data convergence

To demonstrate instances of convergent data, results of the questionnaire reflected the sentiment by MCNY employees about the appropriateness of creating a repository of documents that would include all student Constructive Action projects, standard MCNY documentation format, Middle States documents, State and Federal reports, strategic planning documents, budgeting and grant materials. The same suggestions were made by four out of five interviewees. This knowledge retention procedure was corroborated by six requests out of the 14 (categorised as part of knowledge transfer) witnessed during observation sessions for some of these materials in the library by MCNY faculty.

Convergence was also a feature of the result reflected in Figure 58 where 24 (62%) of questionnaire respondents disagreed with the notion that the knowledge acquired in their

present job positions belonged to MCNY alone, as reflected by a rating average of 2.46; and 16 (41%) strongly disagreed that it belonged to them as individuals as reflected by a rating average of 3.10; while 22 (56%) agreed that it belonged to both MCNY and themselves, even when 10 (26%) opted to use the non-committal choice. This was corroborated by interviewees who suggested that the library needed to take part in knowledge organization for the College. The point of this suggestion was that if the knowledge was organized, it would be easier to identify it as belonging to both MCNY and themselves, potentially enabling the capture and re-use of knowledge.

While interview participants expressed that they did not share information very much because their academic/ professional interests had nothing in common, and they had essentially no need to be sharing any information, 12 (31%) questionnaire respondents also agreed that their colleagues did not seem to perceive that there was an urgent need to share, even if 9 (23%) disagreed with that perception. Thus, there were some individuals who did not see/ have the need to share information or knowledge. The problem with the perceptions of questionnaire respondents, in this case, was the rating average of 2.82 that indicates a large number of respondents giving no opinion too, because it was difficult to explain what it meant. Thus, the mentioned interview results became essential in highlighting the data convergence.

Both interviews and questionnaire results indicated that information and knowledge were not always found in obvious or central places. Instead, 25 (64%) of questionnaire respondents agreed that they found it on their personal computers, while interview participants suggested that for the most part they found and kept their information in folders (print and on their personal computers). The rating average of 3.67 where 5 = "strongly agree" indicates that that was the perception of most respondents. Thus, data collected converged in confirming that there was no centralized place where knowledge could be retrieved from. While a centralized knowledge repository would be useful, in a networked environment, access and organization of knowledge and information would be essential as emphasized in the SECI model of Nonaka and Takeuchi (1995) in section 2.6.1 of Chapter Two.

Another instance of convergent data was that 15 (39%) questionnaire respondents agreed that an open-minded information sharing environment with people from other departments within the College was lacking, and another 16 (41%) agreed that there was lack of trust in other people's knowledge. This was consistent with interview results where it was expressed that information sharing was essential in order to avoid or reduce hostilities – hostilities that could have originated from a lack of information sharing, open-mindedness and trust. The tendency to prefer the non-committal choice of response is reflected by rating averages of 2.74 and 2.77 respectively. That suggests that there were some questionnaire respondents who were ambivalent about giving responses. The researcher suggests that this could have actually been an expression of the inherent lack of trust that existed, despite assurances of anonymity from the researcher and from the IRB of the College.

5.1.2.2 Data inconsistency

Inconsistency can happen within the results of one method, or between methods. Thus while some results obtained from the same data collection method could produce inconsistencies, results from the questionnaire, for example, were not necessarily always consistent with those from the observations. One example from observations was that the integrated library system (ILS) was not linked to any other database system within the College, and that necessitated fresh library registration for every library user as they visited the library for the first time. In other words, at the time of this study, MCNY IT systems were not completely integrated or centralized. On the other hand, questionnaire results reflected a 19 (48%) majority of the non-committal response to the question of the existence of a central information system at MCNY. The rating average of 2.95 indicates that there was an almost equal distribution of affirmative responses and those expressing disagreement. The inconsistency was in the fact that all staff members belonged to MCNY and were aware of the structure of the College information systems, and could have been more decisive about agreeing or disagreeing for a more definite response, but did not.

In the questionnaire, 33 (80%) of the questionnaire respondents agreed, as indicated by a rating average of 1.98, that KM includes information management. However, 20 (49%) also indicated that the concept of knowledge was difficult to clearly articulate. The rating average of 2.00 reflects that most respondents chose to agree. However, 32 (78%) respondents disagreed with the suggestion that they mean the same thing. This was reflected by a rating average of 3.98 that suggests more disagreeing than strongly disagreeing. If respondents were so clear that KM includes information management, and yet confirm that the concept of knowledge was difficult to articulate, then the distinction between information and knowledge must have been even harder for most to make. That could have had an impact on the choices of responses that respondents made.

There was another instance of inconsistency between what was reflected in the questionnaire, where 25 (64%) respondents, with a rating average of 3.79, were in agreement with the position that their strength lay in their ability to use information retrieval tools such as library databases, and what library database usage statistics indicated. The latter did not reflect wide ranging use of the library's e-resources. This could have meant that the databases may have been irrelevant to courses taught, or the users were not aware of their existence, or they were aware of their existence but unsure of their capabilities and how to effectively use them.

Another area of inconsistency involved part of the very reason for this study – that the library needed to improve the quality and enhance the value of its service in difficult economic circumstances. Observations revealed that library users could print unlimited amounts of work for no charge. This included current students, alumni, employees, and visiting students. All this was because there was no print management system in the library. The same point was also highlighted in the library's 2009 annual report. The result was to have uncontrolled printing and heavy use of resources, material and human, especially the attention of library staff being required in resolving many printer-related problems. That seemed inconsistent with a difficult economic environment where accounting for the use of resources could have been an important function of their pragmatic use. In this case, it was doubtful if user orientation/ instruction by librarians

could help on its own without observable management support and resources (such as installing a print management system) to the library. Concurring with Ulrich (1993), the researcher suggests that institutional management support had the potential to clarify the process of adopting "best practices" in monitoring printer usage and costs in/ for the library.

5.1.2.3 Contradictory data

Contradictory results indicate responses that reflect facts that seem to point towards divergent directions. In this study, while 17 (44%) of the questionnaire respondents agreed that they had no time or were too busy to exercise effective and efficient information storage practices, 18 (46%) blamed it on inefficient technology or poor information systems, and 16 (41%) perceived a lack of a proper IT platform to share information on as the barrier. Rating averages of 2.87, 2.44, and 2.54 all indicate the affirmative choice of response, but with the next popularly selected option being to give no opinion Among the questionnaire respondents, 14 (36%) disagreed that a lack of time was the cause for effective and efficient information storage. The researcher interpreted that to mean that sometimes people blamed technology because it was there to be blamed. The impact of these sentiments on library resource use could be negative because in the modern information environment, the library depends on use of information technology as suggested in sections 2.11 and 2.13 of Chapter Two.

5.1.3 Data comparison/ combination and integration: qualitative and quantitative results

When the differences and similarities between qualitative and quantitative data are highlighted, that is data comparison (Greene, 2008; Johnson and Onwuegbuzie, 2004 Onwuegbuzie and Teddlie, 2002). The data were combined into one integrated whole to provide answers to the research questions. Combining and integrating quantitative and qualitative data was intended to enhance depth and clarity to research findings. While quantitative data analysis was based on representative numbers/ quantities, qualitative

data did not seek to choose samples representative of MCNY employee categories. It was based rather on the quality of the data collected. That was why qualitative findings were more descriptive than in charts such as the quantitative results. This combination of approaches was necessary because of the wide range of data needed to discover and develop suggestions for KM practice in the context of an academic library. However, the potential for problems always existed when attempting to combine these divergent research paradigms. For example, it could have been possible to end up not doing either type of research well, especially as this was the effort of a single individual (Fidel, 2008; Leech *et al.*, 2010).

It was established that current MCNY library service needed value enhancement and suggestions on what would be necessary to address the situation were investigated, as well as on what technologies and solutions available could possibly bridge the gap. Thus, using the questionnaire, interviews, institutional documents, and observation, the researcher examined the gap between the current practical knowledge of the problems and current available solutions. Results from the questionnaire and the interviews expressed the perceptions of employees while documents reflected written practices (or lack of them). Observation enabled a focussed investigation into behaviour patterns and practices without interfering.

Findings from the questionnaire, interview, observation and documentary data suggest that MCNY librarians, faculty, and administrators had a varied understanding of the meaning of KM. Despite having a majority of 33 (80%) of questionnaire respondents agreeing that KM includes information management, and 36 (88%) agreeing that knowledge depends on information, there still were small numbers that gave no opinion as well a few disagreeing. All interview participants seemed to have a clear understanding of the distinction. While observations reflected certain events that could be categorised as KM practice, it was in reading institutional documents that the concept of KM did not feature at all.

The MCNY community also appeared to have gaps in managing knowledge, and that impacted the library directly because of its interrelated nature to the rest of the College. For example, while 19 (48%) agreed that knowledge was found in paper-based documents, 3 (8%) respondents gave no opinion, and 17 (44%) did not agree. A rating average of 3.03 reflects that there was a split in numbers between those who agreed and those who disagreed, suggesting that there were some individuals who felt that they had paper-based knowledge stored, while others were sure that was not the case.

Among the respondents, 17 (44%) disagreed that knowledge was in the heads of departmental members, while 16 (41%) gave no opinion about that perception, and 6 (14%) agreed. A rating average of 2.64 signifies that while many respondents agreed with that perception, there were also others who gave a non-committal response. Another 25 (64%) were of the perception that the knowledge they needed to perform their job functions was on their personal computer or workstation, but 9 (23%) gave no opinion and 5 (13%) disagreed. Among the respondents, 12 (31%) agreed, while 12 (31%) disagreed that knowledge storage was effected on all computers in the departments they worked in, and 15 (38%) gave no opinion. The fact that there were many non-committal responses as reflected by a rating average of 3.00, and some responses indicating disagreement with that perception left the researcher unsure about the perceptions of some individuals in regard to knowledge gaps in the system. However, the explanation may also have been that respondents could have given more definite responses if the College had a written and clear knowledge retention plan. This would be consistent with the findings from the study, of Hamid *et al.*, (2007) at the NLM that is mentioned in section 2.11 of Chapter Two.

Knowledge retention policies and practices at MCNY seemed vague as expressed by 21 (54%) questionnaire respondents who felt that there were no proper organizational guidelines on sharing of information, while 15 (39%) believed that the bureaucratic procedures involved in sharing were complicated, and 16 (41%) viewed a lack of a proper IT platform to share information on as a problem. Rating averages of 2.41, 2.72, and 2.74, reflect that most respondents agreed, but with the next most selected choice

being to give no opinion. However, the availability of online communication, blogs, and wikis at MCNY were modern technologies that had the potential to enhance the environment for KM practice. Observations revealed that at the library, the tools, methods and techniques used for knowledge retention - knowledge assessment, knowledge acquisition and knowledge transfer - included manuals and guides, sharing of information by e-mail and face-to-face as well as having regular meetings.

In the literature review, it was established that modern library users are comfortable using spaces provided by social networking technologies (Anderson, 2007a; Harris and Lessick, 2007; Suber, 2007). This was confirmed in observations where 8 (57%) knowledge transfer instances involved the use of e-mail for communication, while all five interview participants confirmed that their most common mode of communication was with the use of both College e-mail and private e-mail (such as AOL mail, Gmail, and yahoo mail). While wikis were used in some individual classes by faculty, the library wiki was not used as frequently as may have been anticipated. In this study, this was an example of the inaccuracy of the assumption that the access individuals had to computers could automatically result in them accessing and using online resources.

According to Anderson (2007b) and Sadeh (2008), collaborative, interactive workspaces such as the wikis that are available have become relevant and librarians need to find ways of making use of the new technologies to best advantage. Observation results indicated that there was only one visit to the library wiki during the times that observation sessions happened. More research needed to be done to find out the reasons for non-use of some resources that were available but were not in use, especially as there was the danger of using Web 2.0 tools just because they existed, without properly assessing their usefulness/ appropriateness in various circumstances. Abram (2008) refers to:

> moving from a technology-centric strategy to one in which the real needs of our clients must predominate. Aligning technology with user behaviour no longer suffices to ensure success. We need to understand, and understand deeply, the role of the library in our end-users' lives, work, research, and play.

The library faced competition from resources like the Open Access Initiative (Suber, 2007), Wikipedia, Google and other internet resources, which library users regarded as alternative sources of information, potentially relegating the importance of the library to insignificance and making the investment in library resources a waste. As such, making searching of library databases easier by using the article linker computer programme (which was categorized as one of the observed knowledge organization events), or revising the library website were attempts to offer easier platforms for library online database access so as to remain relevant.

Another way the library did this was through collaboration with some faculty who encouraged their students to use articles from scholarly journals. Database usage statistics recorded at the time of this study revealed a low to inconsistent use, but this was consistent with only two bibliographic instruction requests made during observation sessions. This seemed to imply a direct relationship between bibliographic/ information literacy classes and database use. It was anticipated that continued effort to enhance library service would gradually improve the situation.

In line with the summary in Chapter Four, Table 13 demonstrates the integration and comparison of findings through transforming all results into verbal descriptions. Some results were similar, but others were not, and that reinforced the suggestion by Woolley (2009) quoted in section 3.8 of Chapter Three that the use of both qualitative and quantitative methods was complimentary rather than validatory. The results merely provided information on the same subject of KM at MCNY from different perspectives. It was similar to the mixed methods study of Woolley (2009: 19) in that there was:

> integration of data at the analysis stage, of findings at the interpretive stage, and in the presentation of these at the reporting stage. In this way, it was possible to use parts of the data set to deepen understanding, to qualify, and to elaborate on findings emerging from other parts of the data set.

Table 13: Integration and comparison of the results through data transformation

Theme	Questionnaire and Structured observation	Interviews and Institutional documents
Understanding of KM at MCNY	➢ Administrators reflected an understanding of KM; and ➢ Observed events reflected that administrators understood what KM refers to.	➢ Interviewees all understood the meaning of KM; ➢ Institutional documents did not reflect KM as a practice, and it did not appear in any documents used; and ➢ KM was not viewed as an integral part of the College's or the library's mission and/ or objectives.
Knowledge retention/ capture	➢ Colleagues, books, documents, computers, and databases were reflected as sources of knowledge; ➢ Knowledge needs of the library related to the ability to understand and anticipate the knowledge and information needs of users; and ➢ Knowledge capture was done but not in a systematic way throughout the College and that had a bearing on how the library functioned.	➢ Colleagues, books, documents, and databases were acknowledged in interviews as sources of knowledge; and ➢ The institutional documents used proved to be valuable sources of data, demonstrating the importance of retaining and organizing institutional documents.
Knowledge generation/ creation	➢ All departments were generating knowledge all the time; and ➢ Systematically monitoring and organizing it was not in place.	➢ All interviewees were generating knowledge all the time but it was not systematically monitored or organized for re-use by colleagues; and ➢ Getting and accessing institutional documents was not always easy and straight forward.
Knowledge organization	➢ No centralized platform for organizing information, but the library could spearhead the process; and ➢ Efforts could not be successful without collaboration with IT.	➢ There was no centralized or merged platform for organizing information; and ➢ Interviewees suggested that the library could spearhead a process of organizing information and knowledge.

Knowledge acquisition	➢ A sub-set of knowledge capture because it was concerned with the ability to map both internal and external knowledge sources; and ➢ Possible link between low usage of library databases and library instruction/ information literacy classes.	➢ A sub-set of knowledge capture because it was concerned with the capture of knowledge; and ➢ Institutional documents were an invaluable source of data even though they were not organized in a manner that promoted retrieval and re-use.
Knowledge transfer/ sharing	➢ The potential for sharing was reflected if an enabling culture was in place; ➢ The culture of knowledge sharing needed to be developed and worked on; and ➢ The need for a knowledge portal was suggested.	➢ Interviews confirmed that there was the potential for sharing knowledge but on the condition of an enabling culture being in place; ➢ The need for a knowledge portal was suggested as an essential; and ➢ Institutional documents that were not classified or coded were difficult to retrieve, limiting knowledge retrieval and transfer.

5.2 Interpretation of findings

The statement of the problem was that the MCNY library was providing a service that needed quality improvement as it did not adequately address challenges posed by a fast changing information environment. However, no documented study or survey at MCNY had investigated why that was so and what needed to be done to improve it. Literature review revealed that there were library science theories that had not comprehensively articulated the impact of the current information environment on libraries. Examples were the critical realism theory, the fuzzy set theory, probability theory, grand unified theory and the grounded theory that were discussed in section 2.5.2 of Chapter Two. There was uncertainty about whether the use of KM principles and tools could partly solve the library's approach to improving its quality of service to its community in the modern information environment. Thus, in this study, following the synthesis and evaluation of library science theory demonstrated in Chapter Two Table 3, the problems were discussed in a KM context. Leedy and Ormrod (2010) point out that interpretation of the data is the essence of research.

Using the data reported in Chapter Four, the patterns that were realized in the data that had been consolidated through combination and integration was the interpretation of findings. According to Greene (2007: 152), pattern matching could support "inquiry conclusions and inferences". The fact that questionnaire respondents were all MCNY employees, had working computers, were using a network that was never out of order during the time of this research, and had College e-mail addresses may have led one to believe that the response rate of the questionnaire would be much higher than 51%. This was proved to be a faulty assumption. However, all interviewees were very helpful and keen to give as much information as possible, allowing the researcher to get insight and explanations about certain practices that were relevant to the topic of the study. This led the researcher to believe that face-to-face communication was more effective than e-mail, hence the more positive attitude of the participants in the data collection stage when this strategy was employed.

Reasons for non-response or a low response rate to the questionnaire from part-time faculty could have been due to excuses that include those expressed by some of them who felt that they had no business completing a questionnaire originating from a librarian because they were not using the MCNY library, therefore issues involved did not concern them. Thus, they perceived that this survey was raising issues that were not applicable to them. This was exemplified in eight instances where individuals from the part-time faculty category deleted the survey message without opening it as reflected in the Microsoft Outlook mail options. According to Kittleson and Brown (2005: 12), a low response rate may also be attributed to the "inundation of e-mails, the proliferation of spam, and the tendency to "trash" items in one's e-mail if they are not immediately pertinent…".

Another explanation that came out at questionnaire distribution was that some part-time faculty members also taught in other colleges. This was reflected with the use of the delivery receipt function of the Microsoft Outlook mail box that showed that, when distributing the questionnaire, some mail was re-directed to the alternative college mail address that recipients were using regularly. As such, they may have preferred to use the alternative library resources they had available to them. This further demonstrated the initial reason for this study, that is, the need to enhance the value of MCNY library resources and service. Other reasons may have also been due to ignorance of the topic under investigation on the part of some of the potential respondents, uncooperativeness, or the reluctance to answer.

The assumption was that there would be a larger number of questionnaire responses from the part-time faculty category than from any other because they were proportionally represented by the largest sample. This was proved to be correct by a response rate of 54% from this category. Concurring with the views of Baskerville and Dulipovici (2006), Creswell (2003), Fowler (2002), Kumar (2005), Powell and Connaway (2004), Vasconcelos (2008), the researcher interpreted response and non-response rate patterns as representative of attitudes and interest in the topic being studied by everyone who belonged to categories represented. An example was that 90% of the incomplete

questionnaires were from the part-time faculty, while all administrators and full-time faculty responded successfully.

There was a prevalence of the neutral position in questionnaire responses. Giving this position in some of the answers may very well have been for invalid reasons. Possibly the option explaining inability to respond, such as "not applicable", "no basis for judgement", "prefer not to answer" could have resulted in a higher response rate with a different set of results. According to a survey by Leysen and Boydston (2009: 276):

> it is difficult to know whether these neutral responses were due to indifference or ambivalence. The large number of neutral responses added to the difficulty in drawing conclusions from the data.

Information from other data collection methods used in this study was therefore used to complement the data from the questionnaire, as suggested by Woolley (2009).

The map of research literature created in Chapter Two Figure 1 was a handy guide that demonstrated that library science study focus had shifted from individual library practice theories to KM and its relevance to library situations. A look at library science theories helped understand how and where their frameworks are applicable in an environment that recognizes KM as a possible significant way of enhancing value and quality of service, and yet operating in a non-commercial organization. Web 2.0 was also included in the discussion because it affects the way KM can be applied in a library. With the data obtained, interpretation happened around the KM concepts of knowledge capture and retention, acquisition, classification/ organization, creation, and sharing as they applied to the MCNY library because they were the basis for the research objectives and questions.

5.2.1 Knowledge capture and retention

The definition provided in Chapter One that "when information is analyzed, processed, and placed in context, it becomes knowledge" (Gandhi, 2004: 369), makes it important to consider information retention as a process in knowledge retention. Knowledge is based on information (Bell, Shank and Lankes, 2008). This was confirmed in Figure 8 by 36

(88%) agreeing that knowledge depends on information. In that respect, information retention strategies were considered relevant as there can be a progression from information to knowledge (Broadbent, 1998; Wen, 2005). This was particularly important in keeping useful knowledge inside the College and avoiding its loss, and that would be its retention or the building of organizational memory (OM) (Walsh and Ungson, 1991).

At MCNY, although the researcher did not find any formal document(s) declaring or specifying what knowledge was vital to the running of MCNY, such knowledge was retained mainly in procedures manuals and job descriptions. This was in line with March and Simon (1958: 142) who suggest that one of the ways of determining performance programmes in an organization is through "examining documents that describe standard operating procedures". Reiterating the same point, Walsh and Ungson (1991) and Özdemir (2010) also express the fact that the memory of organizations or institutions could be housed in policies and procedures. The same knowledge retention point fits into the discussion that focused on the foundations of KM in section 2.6 of Chapter Two. Structured observation and institutional documents confirmed the existence of these documents as being both online and in print. This was reflected by 29 (71%) questionnaire respondents who felt that they always found sufficient knowledge to enable them to do their tasks, even though 5 (12%) disagreed. At the same time, 19 (46%) found the precise knowledge they needed to fulfil their tasks, and 10 (24%) disagreed. Another 19 (46%) were satisfied with the knowledge that was available in their departments for their use while 11 (27%) disagreed.

Some individuals felt that the knowledge they needed was found only among experts at MCNY rather than in a central location as evidenced by 15 (37%) who agreed, while 11 (26%) disagreed. The rating averages of 2.66, 2.20, 2.66, and 2.85 signify that the most of the respondents agreed, but with the option not to give an option also being selected by relatively large percentages of them too. From these responses, it appeared that there was some knowledge retained at MCNY, even with some respondents reflecting uncertainty. In that sense, one could suggest that knowledge retention is a practical application of the process of knowledge capture.

A significant number of questionnaire respondents, 19 (48%), did not give an opinion about knowledge being kept in a central storage space although 10 (26%) agreed and another 10 (26%) disagreed with that perception. The rating average of 2.95 reflects the dominance of the non-committal position in this case. The fact that some respondents disagreed that the knowledge they needed was available may have indicated a lack of awareness about where it was located, or about its very existence. This was interpreted as an instance where a knowledge gap existed, according to the concept as introduced in section 2.10 of Chapter Two. That is because KM is based on "utilizing and exploiting the organization's information (which needs to be managed for this to occur)" (Broadbent, 1998). At the same time, 12 (31%) agreed while 12 (31%) disagreed that knowledge storage was done on all computers in the departments they worked in, with 15 (38%) giving no opinion, and that resulted in a rating average of 3.00 which also demonstrated uncertainty. From this data, there was no response that was popular with respondents to the knowledge storage question, begging the decision to have a formal knowledge retention policy.

It was not clear to the researcher why questionnaire respondents would not give definite responses to knowledge retention questions. However, all interviewees expressed the need to collect and manage a database of institutional documents that the whole employee community would be aware of. That way, questions regarding knowledge retention would have standard answers, and many ambiguities could be minimized. What this suggested was that MCNY had a varied assortment of knowledge assets that were not clearly organized, confirming the original concern raised by Cohen (1989), the founder of the College, who expressed the sentiment that knowledge had not been organized to encourage its practical application in human service practice and performance. This study found that in fact, this issue needed attention at MCNY particularly because of the need to enable survival in a fast changing information environment.

The knowledge assets included those observed during the course of data collection, and those suggested by Inmon, O'Neil and Fryman (2008) as e-mails, contracts, proposals, reports, copyrights, work processes, procedures, products and individual employees with

memory in their heads, that is, a mix of sources of knowledge and information. In the case of MCNY, the content, form, and access were all perceived by some questionnaire respondents and all interviews participants as important to the availability and use of OM. Among questionnaire respondents, 10 (26%) agreed that documented knowledge was in a centralized computer system, while 19 (48%) did not give an opinion, and another 10 (26%) disagreed. There were 17 (48%) questionnaire respondents who agreed that the knowledge they needed was in paper-based documents, even though 3 (8%) gave a non-committal response and 17 (44%) disagreed. This concurred with the suggestion made by Walsh and Ungson (1991: 62) who did not regard a centralized location as pertinent, but rather, a distribution across different facilities. With improved access and sharing, that would coincide with the KM discussion in section 2.4 of Chapter Two that highlighted the importance of the management of print and digital information; sections 2.11 and 2.13 that highlighted the significance of information policies and architecture that allows for sharing and openness by libraries.

The fact that MCNY had a larger percentage of staff working on a part-time basis than full-time had a lot of implications on the need to create information and knowledge retention systems for the sake of consistency and continuity. It was especially important as demonstrated by 33 (83%) of questionnaire respondents who believed that KM depends on information management. This perception was also confirmed by all interview participants. That meant that they valued the relationship and importance of information and knowledge, even if that did not necessarily do anything for the actual use of knowledge and information. According to Broadbent (1998), just being aware of the importance of knowledge does not result in organizational knowledge, but rather:

> It becomes organizational knowledge when there are management processes in place which capture that often personal, tacit, front-line information from which others in the organization learn and make decisions.

Another 25 (61%) of questionnaire respondents were aware that KM is not the same as information management. These data seemed to suggest that KM practice could be in place if individuals in the College had similar (but not necessarily shared) needs intersecting, and the possibility of each having access to relevant data.

5.2.2 Knowledge acquisition

Knowledge acquisition appeared to be sub-set of knowledge capture because the knowledge acquired at MCNY came from such sources as individuals and their colleagues, books, documents, and databases. Questionnaire responses, observations, interviews, and institutional documents all demonstrated this. As mentioned in section 2.10 of Chapter Two, the most complicated aspect of the KM process was identified in literature as the capturing of information and/ or knowledge that resides in people's heads. The use of knowledge "expert systems" (Koenig and Srikantaiah, 2000) was suggested as a way that knowledge acquisition could be done by an organization to achieve the gradual tapping of knowledge existing in the heads of experts while it was still useful. The findings of this study were indicative of the fact that they did not exist at MCNY. But then, this was not expected to be a simple and straight forward exercise as even the private sector approach tended to explain how to use technology platforms to harness tacit knowledge, but did not show applications that could monitor these collaboration pathways so as to separate trivia from the important (Skyrme, 1997; 2004). That was the reason Walsh and Ungson (1991: 73) suggested that it was the "content of this information that is sometimes decried for its role in hindering learning, not the storage facility itself".

Literature review indicated that as in many organizations, it was sometimes difficult to enable some types of knowledge to be extracted and synthesized for the efficient harnessing of OM. In the case of MCNY, that was likely to be even more complicated especially because KM was not the basis of activities. Indications were that there was potential to acquire and store knowledge and information, but encouragement and an enabling environment was needed. The reason for an enabling environment being interpreted as potentially useful was that the application of peoples' competencies, skills, talents, thoughts, ideas, intuitions, commitments, motivations, and imaginations was a foundation for KM practice (Baskerville and Dulipovici, 2006; Broadbent, 1998; Nonaka and Konno, 1998; Nonaka and Takeuchi, 1995) as mentioned in sections 2.6, 2.7, 2.12 and 2.13 of Chapter Two.

Among the questionnaire respondents, 34 (87%) indicated that they were involved in lateral thinking, that is, adapting thinking to suit changing concepts and perceptions about the service that one provided to the MCNY community, 23 (59%) agreed that they had project management capability, and 30 (77%) believed that their work required them to think in terms of MCNY rather than only the department they worked in. Additionally, 26 (67%) agreed that the possession of the power to persuade and sell one's skills in the context of MCNY was essential. Another 30 (77%) were of the view that having the capability to manage change rather than merely endure it was important. In this instance, 24 (62%) agreed that they used the advocacy skill in their work. Rating averages of 2.03, 2.23, 2.38, 2.23, 2.38, 2.49, and 2.54 respectively indicate that respondents perceived themselves as having the requisite skills for KM practice. The predominant response was to agree, with a few having a tendency towards being non-committal, hence the approach towards 3.00 in some rating response instances. However, these available skills were ideal in an environment for capturing knowledge that was in the heads of individuals. What lacked at MCNY was how to capture it.

Section 2.11 of Chapter Two refers to Jantz (2001) who suggested that knowledge acquisition could be enhanced by providing training or training opportunities for staff. Questionnaire responses revealed 18 (46%) respondents who agreed that there were staff development opportunities at MCNY, while 15 (38%) gave a non-committal response, and 6 (16%) disagreed. In terms of the existence of departmental plans for staff developments, 15 (38%) agreed and 15 (38%) gave no opinion, while 9 (24%) disagreed. There was the perception by some employees that the existence of succession planning in departments did not exist as reflected by 14 (36%) who concurred, 20 (51%) opted not to give an opinion, and 3 (13%) felt that it existed. With regard to the use of mentoring as a staff development strategy, 7 (18%) individuals confirmed that there were mentoring incentives, while 16 (41%) gave a non-committal response, and another 16 (41%) disagreed. This could actually be a misreading of the question because at MCNY there was a mentoring department for students, not for management practice. There were also some employees with the perception that training took place when there were new tools

in use as reflected by 14 (36%) agreeing, 18 (46%) giving no opinion, and 7 (18%) disagreeing.

The specific knowledge acquisition activities observed in the library included library website content changes and improvements, the recognition of individuals for their intellectual, professional and practical effort, discussions on ILS development and procedural issues. The queries that were received at the reference desk indicated that users varied in computer proficiency, knowledge of library services, and database search skills. These events and questions were categorised as knowledge acquisition because they gave insight into how to enhance the quality of service the library could provide. An activity that seemed peculiar to the library was the practice of limited job rotation to make sure that all staff had an idea of what their colleagues were doing. It could very well be that it was possible because of the nature of basic library functions which allowed that.

Computer proficiency was found to be lacking in those that needed help with basic Microsoft Office applications. A lack of knowledge of library services was reflected, for example, in making requests for use of software applications that the library did not have on library computers, but were very specific to the courses taught. This could have also been a reflection of a need to include faculty in library instruction classes as the questions asked by students were in certain cases reflective of the extent of the professors' familiarity with the library. The mission of the library did not include teaching users how to use information technology as there were other departments in the College that could do that. However, it appeared as if this information may not have been communicated, or may not have been emphasized sufficiently enough to be recognized, indicating a gap in information transfer. Inefficient knowledge transfer or sharing is the type of organizational shortcoming mentioned by Jain (2007), Jashapara (2005) and Lloria (2008) in section 2.7 of Chapter Two.

A lack of database search skills was most commonly reflected by the frustration expressed by users while trying to use the library's databases. Additionally, faculty, for

example, did not appear to be aware that from the library homepage they could make reservations for information literacy classes for their students, make suggestions on what the library should purchase, place items on reserve so that their students can search for materials that their professors place on reserve. For the library, these were knowledge acquisition opportunities – knowledge of the library users and their expectations.

5.2.3 Knowledge sharing/ transfer practices in the MCNY library

As mentioned consistently in Chapter Two, effective KM requires a constant flow of knowledge, rather than a stock of it. Dierickx and Cool (1989) suggest that while stocks of knowledge are accumulated knowledge assets, flows are knowledge streams within and across organizations that contribute to the accumulation of knowledge. The accumulated knowledge assets can be regarded as part of an organization's OM. Flows facilitate the connections between seekers of specific knowledge and the providers of needed knowledge (Holtshouse, 1998). That makes knowledge flow and sharing/ transfer techniques for encouraging knowledge retention.

The fact that 21 (51%) of the questionnaire respondents expressed that they were able to consult with their divisional supervisors, and another 21 (51%) with their colleagues meant that there was a degree of information flow at MCNY. Observations in the library also revealed the use of face-to-face conversations inclusive of meetings, gatherings, telephone communication, a wiki and a blog as methods of information and knowledge flow. The researcher interpreted all this to mean that there was some degree of sharing of retained knowledge. In addition, the skills that questionnaire respondents expressed in this study as their strengths, such as team skills, people skills, and communication skills, were all essential in a knowledge sharing environment as suggested in sections 2.11 of Chapter Two where studies from the National Library of Malaysia, Rutgers University library in New Jersey, and the University of Edinburgh library in Scotland that investigated KM use in libraries were cited.

There were wikis and blogs used by different MCNY departments. They required a consideration of the workplace culture and environment, the potential users and their requirements, their communication needs and patterns, sharing habits, and management and ethical issues regarding appropriateness of communications (Anderson, 2007a; Fichter, 2005; Harris and Lessick, 2007). In line with the views of the technocentric school of KM mentioned in section 2.6.2 of Chapter Two, there were blogs and wikis in use at MCNY. The readily identifiable ones included the MCNY Admissions blog, the MCNY Emergency and Disaster Management blog, the MCNY Title V Learning Enhancement Centre blog, and the MCNY Library wiki. According to Fichter (2005: 49), "wikis work best in organizational cultures in which there is a high level of trust and control can be delegated to the users of the system". One therefore had to think about how frequently people needed to communicate, what technology people preferred, how often groups wanted to share information, and how many potential users would be involved, among other considerations. The 2009 MCNY technology survey results indicated that wikis were already a part of institutional culture although detailed monitoring of the use of all these platforms was beyond the scope of this study.

Knowledge flow is the way knowledge travels and grows within an organization (Dierickx and Cool, 1989; Koenig, 2003; Nonaka and Takeuchi, 1995; Williams *et al.*, 2004). The fact that it is more about the human elements than the technology that supports it was confirmed by the very low usage of library databases and the library wiki. Institutional documents and observations also revealed that MCNY had accounts in iTunes, Facebook, Twitter, and YouTube that appeared on the MCNY homepage. The very usage of these platforms was interpreted by the researcher to raise the need for continued research into communication methods and marketing using Web 2.0 resources. This could actually be a knowledge generation exercise for the library in particular and the College in general, especially as it also related to technological challenges including limited computer skills, difficulties in coping with changing technology as that was likely to inhibit the capture and preservation of data.

Similarly, the economic (commercial), technocentric, and behavioural schools of KM that were mentioned in the literature review in section 2.6 of Chapter Two indicated that knowledge flow requires a working environment that nurtures and accelerates the sharing of knowledge. However, from interviews, there was the feeling that, regardless of which College department one talked of, this knowledge flow also required management support for its success. The researcher suggests that this approach could be beneficial to KM efforts given that the perceptions of questionnaire respondents reflected that knowledge sharing enabled their quick accomplishment of tasks as evidenced by 29 (71%) who agreed; 30 (73%) agreed that it improved their job performance; 30 (73%) agreed that it was generally useful in their jobs; and 28 (68%) agreed that it enabled them react more quickly to change. Rating averages of 2.27, 2.17, 2.24, and 2.05 respectively indicate that most of them agreed with the perceptions. The noted suggestion from an interviewee about reducing hostilities in a department in order to encourage good communication had undertones of hostile situations that had been, or could be encountered. This situation may have required the attention of management, but did not encourage knowledge flow or sharing. According to Broadbent (1998), KM is "more than managing information flows". The individuals involved and their appreciation of the benefits of sharing also matter.

Knowledge sharing was seen as happening in the library and by library staff to the MCNY community. This was confirmed by observations that revealed its presence in a blog and a wiki. However, interviewees expressed that at MCNY, knowledge was not always shared openly. If knowledge sharing was viewed as a process (Broadbent, 1998; Davenport and Prusak, 1998), it involved a sequence of events, actions and activities that had to evolve with time (Al-hawari, 2007). As suggested in section 2.10 of Chapter Two, it required roles and context (Kim, 1999), played by MCNY individuals or departments: the role of bringing (offering, showing, and teaching) and the role of getting (acquiring, learning) knowledge among individuals. These roles and an enabling context, from interview and questionnaire respondent results, were not perceived as effectively filled.

Knowledge sharing is typified by the characteristics of knowledge that is shared (Hendriks, 2004), and that was observed to be a characteristic of the way the library operated. It very much depended on trust between departmental members. A lack of trust of other people's knowledge is a weakness if it exists in an organization (Lloria, 2008). From the questionnaire, 12 (31%) gave a non-committal response to the perception about there being a lack of trust of other people's knowledge, 16 (41%) agreed with that perception, but 11 (28%) disagreed that this was the case at MCNY. The rating average of 2.77 signifies that there were affirmative and non-committal choices made, but with the affirmative being the predominant one.

The fact that 16 (41%) questionnaire respondents felt that there was a lack of trust of other people's knowledge could make it harder for individuals to use colleagues' expertise for creating new ways of giving service. Tapping from the characteristics of the behavioural model of KM that was mentioned in section 2.6.3 of Chapter Two, an absence or shortage of trust mattered in the context of both the MCNY knowledge sharing culture and the library in particular.

Sharing information and knowledge about the value of the library to the College community was reflected by the importance that faculty placed on library support for students. It was established from the findings that knowledge sharing activities could be improved within the College. In line with sections 2.6, 2.7 and 2.13 of Chapter Two, communication channels are regarded as the medium through which organization members interacted and shared knowledge. Different channels of communication were available at MCNY and included conventional as well as technology-enabled ones. Indications from 31 (75%) of questionnaire respondents were that they saw knowledge sharing as facilitating knowledge transfer, and this was reinforced by all interview participants. In spite of that, 15 (39%) of the questionnaire respondents felt that there was a lack of an open-minded environment for sharing knowledge at MCNY, confirming interviewee statements about the same fact.

The implications of a lack of open-mindedness on library practice were that any attempts that the library made at encouraging these KM features would be fruitless if they were not a part of MCNY knowledge sharing culture. It would not even matter if there was no proper IT platform to share information as expressed by 16 (41%) who agreed with that perception. Maybe from the use of a reward system that was perceived to be conducive to the creation of reusable knowledge resources, and towards contributing to a library or collection of reusable knowledge resources, knowledge capture could, if put in place, start happening in a formal way. That means that knowledge capture and retention capabilities needed to be in place from a policy stand point – a suggestion mentioned in section 2.11 of Chapter Two that was dedicated to reviewing literature on KM in libraries.

As mentioned in Chapter Two, in a knowledge sharing culture, people are rewarded for individual achievements, and are recognized as well as rewarded for their knowledge sharing and contributions to team efforts (Stankosky, 2005). Giving incentives as suggested in sections 2.7 and 2.10 of Chapter Two, to individuals for contributing to KM activities could have been an effective way of encouraging staff to participate (Barquin, 2001; Gross and Leslie, 2008; Sharma and Chowdhury, 2007; Weddell, 2008; Wen, 2005). In other words, recognition and rewards are perceived to have the potential effect of encouraging staff to embrace changing ways of collaborating, knowledge and information dissemination and providing library service. This was identified as a characteristic of the MCNY library in that if a member of staff was going for a conference or workshop, that was not considered as vacation time. Rather, it was recognized at performance evaluation as an attempt to improve one's professional capabilities. As a result, staff had no hesitation participating in seminars, either as online or physically, and attending a few conferences. This confirmed the findings of Aharony (2011: 20) whose research revealed that:

> The more librarians feel that they receive rewards, the more they trust the organization, the more they are ready to collaborate. Furthermore, the larger the rewards the librarians receive, the more positive attitude they have towards knowledge management… among those librarians whose attitudes towards

> knowledge management are lower, the reward plays an important role; if they receive a reward, they will be ready to collaborate. Moreover, librarians who are less threatened and get reward have better attitudes towards knowledge management.

A study of usage trends of such databases as ebrary book usage, EBSCOhost, WilsonWeb helped in investigating the implications of the patterns. Even if it was not possible to determine whether it was faculty or students accessing the databases due to non-use of individual login, it was possible to read usage trends by searches and retrievals. Results indicated inconsistencies and sometimes under-usage of resources, and that was a likely indicator of a possible lack of information sharing and collaboration between the library and faculty. The fact that some questionnaire respondents were ambivalent about library service that is already in place could have meant that they were not aware of the said service. Among questionnaire respondents, 14 (36%) agreed that the library was providing orientation to new faculty, while 17 (44%) gave a non-committal response, and 8 (20%) disagreed. As far as the library providing orientation service to new staff members was concerned, 13 (33%) agreed that it did, while 16 (41%) opted not to give an opinion, and 10 (26%) disagreed. Rating averages of 3.28 and 3.21 reflect the ambivalence of the responses by being in the 3.00 range that reflects the non-committal position.

A revised approach that has roots in the teaching curriculum has the potential to be useful, as suggested by Bell and Shank (2004) in section 2.4, and Kidwell, Vander Linde and Johnson (2000) in section 2.7 as well as by Hayes (2007) in section 2.11 of Chapter Two. This was confirmed by 18 (46%) questionnaire respondents agreeing that the library needed to be mandated to provide user orientation sessions to new faculty, while 17 (44%) did not give an opinion about this idea, and 4 (10%) disagreed. Additionally, 14 (36%) agreed that the library needed to be mandated to provide user orientation to new staff members, but 21 (54%) gave no opinion about this approach, while 4 (10%) disagreed. Another 16 (41%) agreed that the library needed to be mandated by the College to provide user education workshops to all staff members, but 19 (48%) gave no

opinion while 4 (10%) disagreed. The rating averages of 3.49, 3.31, and 3.46 reflect a predominance choice of the non-committal position. The researcher interpreted this situation to be one that needed institutional policy intervention for a clear direction to be determined.

Making reference to the suggestion made by Kim (1999) in section 2.12 of Chapter Two, knowledge sharing is regarded as an important mechanism that has the potential to enable the turning of individual knowledge into a group's organizational knowledge. The basis on which this can happen is collaboration (Materska, 2004). The spirit of collaboration was viewed as existing at MCNY by 26 (63%) who agreed that members of their departments were satisfied by collaborating to accomplish tasks. This was confirmed by interviewees who felt motivated to share and collaborate around shared knowledge. In the context of the library, this was confirmed by the way the library director encouraged knowledge sharing. However, the success of library initiatives also depended on College wide policies and plans.

To demonstrate the impact of the spirit of collaboration, all interview participants expressed strongly that collaboration was a key factor to the success of KM practice. This was in line with the mention of the same concept in sections 2.4, 2.6, 2.10, and 2.13 of Chapter Two. Additionally, questionnaire results indicated that the information literacy component could be effective if faculty and librarians collaborated in providing it. Ivey (2003) saw conditions for this collaboration to be shared understood goals; mutual respect, tolerance, and trust; competence for the task at hand by each of the partners; and ongoing communication. This was potentially possible, judging from questionnaire results where respondents felt that information literacy could be useful if given as mandatory for every student during the first semester upon entry into College. This could be effective with the involvement of faculty in organizing library instruction because librarians would then give relevant and focussed instruction to students. This was an environment for collaboration and information sharing which could enable KM practice (Kifer, 2005; Pantry and Griffiths, 2003; Rowley, 2003).

Discovering and avoiding potential gaps (Jain, 2007) in essential knowledge was critical to the efficiency of the College and the library. The problem noted in the observation and confirmed by questionnaire responses was that not all files were necessarily stored in a manner that allowed for easy retrieval. As Green (2008: 13) puts it in such a case, "they don't allow for the rich types of categorization that a true social library requires". However, there had been an effort to re-organize the library's shared drive as has already been mentioned.

The authenticity of knowledge is very important so that it is always identifiable as such. Information and knowledge have to be available, but at the same time, those that are using it have to have trust, be assured of its integrity and non-repudiation. A librarian is the person most suited to "integrate vetted and social content in one place…users quickly gain enhanced knowledge in the context of the vetted content" (Green, 2008: 14). This was observed to be a challenging task in the MCNY library environment that included popular search engines like Google, and also in a situation where questionnaire respondents were not prone to sharing information.

Information technology (IT) was acknowledged as one of the core pillars of KM as indicated from the research by Stankosky (2005) mentioned in section 2.6 of Chapter Two. In this perspective, IT can support the process for knowledge creation, sharing, application and storage. In view of the fact that every employee at MCNY had an e-mail account and could interact easily online, the researcher suggests that there was the potential for the extraction of useful information from an intranet. That could be a way to identify any experts or specialists who may have had untapped knowledge, that is, the human capital analysis at MCNY. If the IT platform available was used for information and knowledge gathering, then implications of individual privacy and related issues needed be dealt with. An intranet platform could also enhance the interaction of individual, group, organizational, and inter-organizational knowledge (Nonaka and Takeuchi, 1995; Singh, 2007).

The already available modern technology at MCNY was a strength especially if used to also incorporate KM practice. The interactive nature of knowledge sharing required that the College embrace a culture of the free-flow of information. The way that knowledge was transferred could be regarded as its presentation and dissemination, and would be dependent on the communication infrastructure, information transfer protocols, and its social structure, its knowledge sharing culture and information dissemination (Stankosky, 2005). This is where the expertise of the IT department would become essential. For librarians, it made sense to discuss Web 2.0 interactivity and wish it on the library, but the IT department was positioned to help by its consciousness of what was practical vis-à-vis what was not. One contributory factor to the problem was, as expressed by both questionnaire responses and interview data, that the IT policy at MCNY was not obvious or clear.

Funding plays an important role in the use of IT in an organization, which means that if the organization makes a big investment in IT applications, they are likely to acquire the required numbers of computers and software applications for use, with required access time to the internet and other IT services (Hawkins and Oblinger, 2005). Additionally, the findings of Hayes (2007) mentioned in section 2.11 of Chapter Two suggest that KM processes can be supported by many technologies that depend on a basic IT infrastructure, such as local area networking and internet connectivity, to function optimally. Technologies that existed in the College at the time of this study had the potential to help facilitate the processes of managing knowledge within the organization and enhance the ability of the staff to communicate with each other.

In terms of the challenges that individuals faced in sharing information with people from other departments within the College, 21 (54%) questionnaire respondents agreed that the bureaucratic procedures involved in sharing were complicated, and 16 (41%) agreed that there was no proper IT platform to share information on. However, 17 (44%) among the questionnaire respondents did not commit themselves to agreeing of disagreeing with this perception. This lack of commitment to a definite opinion made the analysis difficult because there was no obvious reason for it. With 13 (33.3%) of questionnaire respondents

agreeing that there was no proper IT platform to share information on, it was important to verify if respondents' perceptions were based on a proper understanding of what the existing MCNY infrastructure did. It was also necessary to find out the impressions of interview participants and observe how IT facilities were used in the library. It was found that some perceptions were not necessarily based on any evaluation of MCNY's IT facilities. They were based mostly on what the individual respondents used their technology resources for, rather than on the weaknesses of the technology. Section 6.4.6 of Chapter Six suggests recommendations on implementing tools, methods and techniques for knowledge transfer at the MCNY library.

5.2.4 Knowledge creation/ generation

After retrieving information, the next step is to use it for knowledge creation. This is dependent on the culture and behaviour of those that are retrieving because "a knowledge culture characterizes an organizational culture that understands and values knowledge management" (Baskerville and Dulipovici, 2006: 91), values the knowledge, feedback and control, and actual implementation. This suggests that the context of knowledge creation and the process of converting it are essential for KM success (Davenport and Prusak, 1998).

The MCNY library operated in a new information environment characterized by rapid changes in technology. It supported and encouraged knowledge creation by researchers through making research resources available. Even if MCNY librarians did not have faculty status, the ACRL (which agreed with the Middle States Commission) expected them to provide quality service, and that created a condition for them to grow professionally. Growing professionally could happen if the library allowed itself to be a learning organization. Section 2.6.1 of Chapter Two referred to the works of Baskerville and Dulipovici (2006), Jain (2007), and Rowley (1999, 2002) who mention one of the characteristics of the economic school of KM as incorporating the ability to be a learning organization that enables creativity, and in the process increase the value generation capacity of an organization. Belonging to professional organizations such as METRO

Council, NyLink, and ACRL greatly enhanced the potential and knowledge of librarians for the benefit of the College, such as through attending webinars and seminars. Being members of the ACRL also encouraged chances of conducting knowledge gap analyses relevant to ACRL information literacy standards, hence the existence of information literacy classes that the library provided. In the long term, the enhancement of librarian skills could culminate in innovative ways of service provision, positively affecting or influencing the success, competitiveness, and prosperity of MCNY in general.

Concurring with the KM analysis depicted as the SECI model by Nonaka and Takeuchi (1995) mentioned in section 2.6.1 of Chapter Two, Daud, Rahim and Alimun (2008), in a classroom setup, suggested that the concepts of knowledge creation (socialisation, externalisation, combination, and internalisation) and innovation had a strong relationship but this relationship had not been examined systematically. The results in the current MCNY study bring some light into this suggestion.

In the MCNY library, socialisation (originating *Ba*) occurred when librarians set out to organize the manner in which they could fulfil their academic support role. There was an emphasis on encouraging direct physical face-to-face experiences with library users. At the circulation and reference desks was where most of the interaction happened. The library also supported the use of technology by providing computer labs with 40 computer work stations and online access, as well as guidance on the effective use of technology and resources. It provided the facilities for information use and re-use, in addition to creating short tutorials for the library user community as well as regularly collecting information about user needs. It was where the knowledge creation process could be viewed as beginning. In that sense it was a technique for knowledge retention or capture. It was therefore important for the library to find a way of collaborating with faculty, regardless of their having access to alternative library resources, because this would be specifically targeted at benefitting MCNY students.

In terms of incentives being used at MCNY for contributing to a library or collection of reusable knowledge resources, 30 (73%) questionnaire respondents agreed that it was a

good idea, while 6 (15%) gave a non-committal response, and 5 (12%) respondents disagreed. All interview participants had positive views about the use of incentives. It has been noted in this chapter that the library used some incentives for individuals who worked in the library. However, because incentives and rewards operate within the area of motivation (Aharony, 2009), there is also the concern about the possibility that an incentive or rewards programme may result in individuals becoming enthusiastic to share, knowing that they will receive bonuses but forfeit the good quality of content contributed. In their study, Fahey, Vasconcelos and Ellis (2007: 186) found that:

> the introduction of rewards devalued the concept of knowledge as a public good, voluntarily shared out of moral obligation and community interest. Instead, knowledge came to be seen as a private good to be shared out of economic self-interest. Following the introduction of rewards, the primary motivation of many members to participate within the community shifted from community interest and moral obligation to that of economic self-interest.

Nonaka and Konno (1998: 40) were quoted in section 2.6.1 of Chapter Two as suggesting that "*Ba* may also be thought of as the recognition of the self in all". Taking this line of thought, it becomes important to consider the suggestion of Kulkarni, Ravindran and Freeze (2006), that individual interactions in a workplace are anchored in self-interest. That therefore reinforces the need to create an enabling environment that can encourages less self-centredness, especially with the responses relating to self-perceptions in questionnaire responses in this study confirming the self-centredness of individuals. For example, most respondents confirmed that they were flexible while performing their tasks, possessed team skills, people skills, communication skills, were able to use information retrieval tools such as library databases, had expertise in creating, recording and storing information, and were able to assess and evaluate information. Where the 5 = "strongly agree" and rating averages were 4.44, 4.13, 4.26, and 4.44, the respondents appear to have had highly favourable self-perceptions about their personal skills.

The same applies in the case of individuals being able to take responsibility for failure of unsuccessful projects. In agreement with the suggestion made by Barquin (2001) in

section 2.10 and by Srivastava and Bhatnagar (2008) in section 2.12 of Chapter Two, Chantarasombat (2009) suggests that the taking of responsibility has to do with employee participation in what is taking place in an organization and a sense of belonging. While 17 (41%) of questionnaire respondents were willing to take responsibility for failure, there was also a large percentage of 15 (37%) that gave an ambivalent response, making it difficult to conclude how far individuals were prepared to take risk, or make risky decisions, or initiate actions whose outcomes they were not particularly sure of.

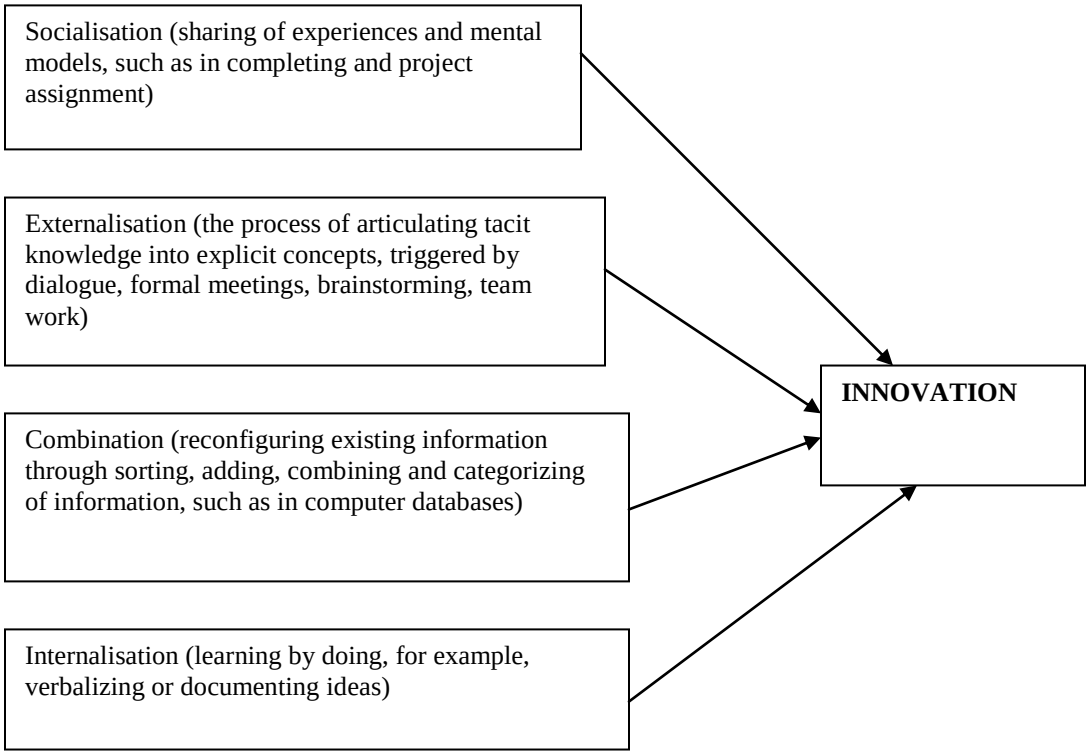
Externalisation (interacting *Ba* explained in section 2.6.1 of Chapter Two) in the library was expressed through the building and management of a collection that came in a variety of formats, and their associated technologies. An example was with the eBooks and e-journals that the MCNY library had opted to use. This required a creative team with different specialisations triggered by dialogue, regular formal meetings, brainstorming sessions, and continued monitoring of problem areas, that is, success through interaction and dialoguing. The work of the MCNY librarians in conjunction with the webmaster and the education technologist to enhance the usability of the library website was a case in point. During the course of this study, the website of the library was transformed from one that users found confusing to a conventional one that provided more information with fewer words.

The combination mode (cyber *Ba* explained in section 2.6.1 of Chapter Two) was expressed by the library's attempts to anticipate user needs. This was augmented by faculty – librarian efforts at creating components that were intended for embedding into the teaching curriculum and facilitated by the use of information technologies – an important component of the education goals of MCNY. According to the Student Handbook (2009c: 3), one of the core values of MCNY was "identifying and implementing creative opportunities to provide quality programs and services". The library supported this value and was also expected to uphold it. Additionally, statistics that showed the patterns of usage of MCNY web pages indicated that the library was the second most visited place online. This traffic encouraged librarians to think in terms of effectively using their already popularly visited address to maximise outreach.

Internalisation (internalising *Ba* explained in section 2.6.1 of Chapter Two) occurred when librarians acquired experience from the work they did in the library, and as information literacy instructors, and documented this as user manuals, guides, and published papers. Innovation by library staff who worked in a modern information environment was subsequently reflected in the enhanced quality of service the library could provide, as well as increased expertise by librarians. It was also reflected in carrying out the current study as it was intended for finding ways to enhance the value of MCNY library service. The expertise of librarians was constantly tested due to the demands on limited numbers of librarians in a fast changing information environment. This situation was consistent with the knowledge economy where there were fewer workers and an increase in the use of the web (McDowell and Christopherson, 2009).

Besides keeping the library website updated, the webmaster gave practical suggestions on how to make the website an interesting space to use. This collaboration was essential since this was a window that portrayed the image of the library. The SECI process which culminates in innovation is demonstrated in Figure 81

Figure 81: Innovation in academic performance (adapted from Daud, Rahim and Alimun, 2008: 76)



5.2.5 Knowledge organization/ classification

The majority of questionnaire respondents and all interviewees felt that there was need for the creation of a repository, or repositories at MCNY. This is in line with the knowledge bank concept at Ohio State University as described by Branin (2003), or a repository (Bailey, 2005) in section 2.10 of Chapter Two. These would include material like CAs, handbooks, and other institutional documents in digital form. This is an instance where the involvement of the library would be inevitable. Out of the context of KM, classification of library material has always been mainly for easy retrieval by library users. Encouraging the access and use of information and knowledge is aimed at encouraging the creation of new knowledge. That makes the process of classification and codification worthwhile because it would otherwise be pointless putting in a lot of effort into preserving information and data only in the hope that someday the knowledge will be

discovered. With KM principles, it extends to include classification of knowledge for easy retrieval.

When knowledge is available, it is of no value if it cannot be accessed for use. To be used, it needs to be retrieved from where it is retained. This was found to be relevant concerning the organization of the MCNY institutional archive. A small part of it was physically stored in the library, the bulk of it was stored in other locations, but indexing and classification was not being done at the time of this study. This resulted in retrieval of information being close to impossible. Having these documents organized would not necessarily imply that they could be accessed by anyone who chose to as it was possible and practical to use secure limited access to private and unpublished institutional documents.

Interviews and institutional document reviews indicated that MCNY departments had no set standard for CAs. It seemed like a contradiction, especially with 26 (67%) of the questionnaire respondents agreeing that all CAs needed to be stored in a repository. This was reinforced by 22 (56%) who disagreed with the perspective that only those CAs with good grades deserved to be stored. The institutional symposium organized to take place on December 4 2009 to discuss issues relating to CAs could form a basis for the standardizing of CAs, deciding how and where they should be stored, including the library's involvement, and all issues relating to the CA projects. Maybe that could be the start of a culture of information and knowledge retention, indicating the necessity for the proper organization of knowledge assets.

Rowley (1999: 417) suggests the creation of knowledge repositories, improvement of knowledge assets, and the enhancement of the knowledge environment. This would call for knowledge classification. The OCLC's WebDewey project mentioned in section 4.3.6 of Chapter Four is an example of the MCNY library using a feature of KM practice.

Another example of the practice of information organization in the MCNY library was realized with the re-organization of the library's shared computer drive. Previously it was

more like a dumping place for files and folders that the creators felt they could not throw away. As time progressed, it became very difficult to retrieve anything from that drive. Use of the services of an archivist intern, in early 2009, to organize the drive resulted in a more organized database. It was possible to find information about user-centered surveys that were done, and quoted in section 1.6 of Chapter One in the section that discussed the originality of this particular study. Because it was not difficult to retrieve them, the researcher obtained knowledge about efforts that were made prior to this study, by the library, to understand their place in the College. This was an instance that demonstrated the usefulness of organized knowledge.

According to Al-hawari (2007), "the majority of managers recognize knowledge management as a mixture of the human and technical with an emphasis depending on how they classify knowledge itself". Codification facilitates retrieval and re-use, that is, artefacts, linguistics, and ontology − "the theory of being which has strong implications for the conceptions of reality" (Wikgren, 2005: 12). Baskerville and Dulipovici (2006: 94) suggest that:

> mechanisms for articulating tacit knowledge for codification include narratives, embedding knowledge systems, and knowledge models. Narratives involve capturing stories that illustrate tacit knowledge. Embedding tacit knowledge into systems involves knowledge engineering for the purposes of capturing rules and relations within a computer based expert system.

The researcher therefore suggests that through involvement with METRO Council, NyLink, and ACRL courses, there was the possibility for librarians to learn and acquire the skills for processing institutional knowledge assets that encompass documents not traditionally processed by librarians.

5.3 Synthesis

The interpretation of findings was done with constant reference to Chapter Two because the literature reviewed in that chapter was intended to support or augment the arguments

of the research, while also synthesizing the ideas that others have already put forward, and possibly discovering research gaps.

It was apparent from the interpretation of findings that most KM activities were centered on the capability of the College to retain and organize its knowledge assets, or institutional memory. Retaining them would be with the use of an effective knowledge organization, knowledge sharing, knowledge acquisition, and knowledge generation culture, to be successful. Organizational culture was understood to be a set of values, beliefs, assumptions and attitudes that are deeply held by the people in an organization. They could influence the decisions people made and the ways in which they behaved. This included the people who worked in the library. At MCNY, that culture needed working on.

From questionnaire responses and interviews, it was realized that most respondents agreed that rewards should be in place for creating reusable knowledge resources, reusing existing knowledge resources, and contributing to a library or collection of reusable knowledge resources. The actual use of incentives at MCNY was therefore not obvious. But then if instituted, the individual motivational elements of human beings needed to be considered as that had the potential of derailing well- intended KM plans. It was unclear whether recognition was only for individual achievement where people were rewarded for their personal knowledge and had no incentive to share knowledge. The results therefore indicated that the culture of MCNY theoretically partly encouraged sharing of information and knowledge, but that in practice there was still need and room for improvement.

The knowledge cycle discussed by Rowley (2001), which was consistent with the pillars of KM that Stankosky (2005) suggested, was pertinent to the synthesis of this study. It is composed of knowledge use, knowledge revision, knowledge creation and construction, knowledge articulation, knowledge repository updating, and knowledge access as processes with no beginning or end. This process fitted in well with an action research context. The desire to have the capacity to create knowledge in the modern information

environment was regarded as an incentive for the College library to allow itself to be a learning department of MCNY. It is through learning and realizing shortcomings that it could potentially become clearer where KM practices would be most effective and worth investing in. That way it would become more practical to initiate the systemic regard of knowledge as a resource or an asset. According to Broadbent (1998), "KM is about enhancing the use of organizational knowledge through sound practices of information management and organizational learning".

According to Baskerville and Dulipovici (2006: 90), "manipulation of knowledge is an essentially human process that cannot be separated from culturally based interpretation and reflection". Thus, the perceptions of questionnaire respondents who expressed that information and knowledge acquired at MCNY belonged to them individually made it clear that they could only share it at their own will, sometimes to the detriment of the work environment. This was in agreement with the critical realism theory of Wikgren (2005: 19) which stated that:

> the properties possessed by the social and cultural forms…that condition information activities, may be different from those possessed by the individuals…upon whose activity they depend.

Essentially, librarians' skills have to be nurtured and developed to the benefit of all clients and beneficiaries (Abell, 2000).

5.4 Chapter summary

There was awareness at the MCNY library that the new information environment demanded revising the way library service was provided. It was not possible for the library to operate in isolation as it was an integral part of the College. The same reason raised the need for improved quality of service since it operated primarily in a support capacity. It was established that knowledge is based on information. The creation of knowledge repositories, participation in the improvement of knowledge assets, and the enhancement of the knowledge environment, could be ways for the library to be involved with any KM plans by the College. These resources could be viewed as part of the

College's institutional memory. This called for knowledge classification which was perceived as important in facilitating resource sharing. Thus, KM was not regarded as a solution but as a way to better use the expertise within and available to MCNY, and more specifically to the library. Broadbent (1998) suggested the "purposeful management processes which capture often personal and contextual information that can be used for the organization's benefit".

Information flow was suggested as the way knowledge could travel and grow within the College. Similarly, knowledge flow also required a working environment that nurtured and accelerated the sharing of knowledge. Knowledge sharing was viewed as an important mechanism that could turn individual knowledge into the College's organizational knowledge. The MCNY library practices were not deliberately based on KM principles. However, on looking at the knowledge capture, retention, organization, and capture – including the SECI Process - it was established that MCNY library was amenable to KM practice. It was making efforts to share know-how so as to reduce duplication of effort, relying on library staff to identify, integrate, acquire, and organize internal and external knowledge for the benefit of the College as a whole.

Finally, the elements of KM that ended up being highlighted included the knowledge system (that was where discussion centred on knowledge capture, classification, storage and retrieval), OM, knowledge transfer/ sharing and the importance of trust, the potential benefits of a learning culture, and the relevance of an assessment of KM practices at MCNY and in the library for purposes of having an idea of a way forward in a competitive new information environment. Within the academic library context this meant the collaboration of librarians and faculty in creating an educational environment meaningful and relevant for the study programmes offered by the College**.**

CHAPTER SIX: SUMMARY OF STUDY FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

If a man will begin with certainties, he shall end in doubts: but if he will be content to begin with doubts, he shall end in certainties

Sir Francis Bacon (1561-1626)

6.0 Introduction

Using the data presented and interpreted in the previous two chapters, this chapter restates the purpose and research questions of the study, and provides a summary of the findings. It also provides conclusions and recommendations based on the findings of the study and the research experience gained during the conduct of the project. Having started with doubts about whether the use of KM principles and tools can partly solve the MCNY library's approach to improving its quality of service to its community in the modern information environment, findings from this study have given indications that KM survival principles and tools are likely to help it to improve on performance and fulfil its mandate.

6.1 Research purpose and research questions

The purpose of this study was to establish the KM role of the library at MCNY in the new information environment. It was also to highlight that it could be useful if knowledge was considered as an asset which can be captured, codified, shared, and distributed depending on the requirements of the College and its library in response to change in order to compete with competitors. In order to fulfil the purpose of the study, the following research questions guided the study:

1. What do librarians, faculty, and administrators understand KM to mean?
2. What are the knowledge needs of the MCNY community?

3. What knowledge retention policies, practices and gaps are in existence at MCNY?
4. What modern technologies are in use at MCNY that enhance the environment for KM practice?
5. What are the tools, methods and techniques used for knowledge retention--knowledge assessment, knowledge acquisition and knowledge transfer at the MCNY library?
6. What recommendations on implementing KM practices that enhance the value of library service at MCNY?

6.2 Summary of the findings

This section presents a summary of the research findings based on the research questions of the study.

6.2.1 Librarians, faculty, and administrators and their understanding of knowledge management

- From questionnaire responses and interviews, the managerial levels clearly understood KM concepts; and
- Some employees were not sure about the differences in the meanings of knowledge and information, but that did not include the administrative levels.

6.2.2 The knowledge needs of the MCNY community

- There were no obvious KM practice guides mentioned in institutional records, interviews, or observed, reflecting a knowledge need;
- There were limited guidelines for the identification MCNY archival records, but an up-to-date catalogue of library material was used to retrieve library documents;
- Interviewees indicated that they were not aware of a records inventory covering documents that were not directly related to their job functions;

- The library used steel cabinets to store a small number of College records, but the rest of the archives were in another location;
- Determining what storage space to use was cited in two interviews as a major problem faced in storing College documents; and
- Questionnaire respondents and interviewees indicated that the absence of an organized document centre or repository for storing of all College records and documents resulted in the scatter of information and knowledge in the departments and that made it difficult to retrieve it.

6.2.3 Knowledge retention policies, practices and gaps in existence at MCNY

- The findings of the study show that the MCNY had a mission statement but the library and the Student Services Departments had additional mission statements which operated within the parameters of the College one;
- Research findings indicated that senior administrators viewed KM as important in the fulfilment of the College's vision, mission and values;
- The MCNY database systems required varying login details at the time of this study because they were not merged;
- Respondents suggested that a centralized or merged system had the potential to facilitate the sharing of relevant documents and records if all of them were organized in such a way that they could be accessed by individuals from a single entry point;
- The findings of the study show the existence of procedures manuals in the library since it was the focus of the study. These were used as operational guides;
- Respondents did not appear to be aware that the library handbook was posted on the library website, but the website itself described in detail the procedures and forms to be used when interacting with the library;
- The findings of the study show that the library was allocated a budget for enhancing the resources - and these resources included human ones;
- The MCNY Self-Study (2009) stated that there was consensus among students and staff that library resources and services were not adequate;

- The findings of the study show that there were no clear standards for Constructive Action projects across departments and that impacted upon methods for a process to archive them;
- With regard to facilities for document storage, the findings of the study show that there were no facilities available yet at the College to sufficiently cater for document storage, whether they were physical or digital;
- Some interviewees cited space as a major problem faced in storing Constructive Action projects and curriculum documentation, and this was a major gap as even the library had no record of these;
- The findings of the study indicated the absence of a document centre for the storage of printed records resulting in the scatter of records in several locations;
- All questionnaire respondents and interviewees showed the existence of computers in their offices and workspaces, and observations confirmed this and these were potentially rich sources of information and knowledge;
- There were procedures manuals observed in the library;
- Passwords were used to ensure secure access to private and unpublished institutional documents and this was essential in a networked environment;
- Some research participants faced challenges including limited computer skills, capturing data, difficulties in coping with changing technology and preservation of data;
- The College had not taken any survey to determine the amount of records created in the College to warrant a need for the library to be involved; and
- The desire was expressed in interviews to develop a programme for managing all documents and records.

6.2.4 Modern technologies that are in use at MCNY to enhance the environment for knowledge management practice

- All employees had an e-mail address for business communication;
- Interviewees, observations, and questionnaire administration showed the existence of computers in all departments;

- The findings of the study indicate that computers in offices were used to create records;
- Microsoft Office was the commonly used software to create records;
- The finding of the study show that access passwords were used to ensure security depending on the staff category and responsibilities one had;
- Some of the questions and needs expressed in the library indicated that some employee challenges included lack of computer skills, lack of knowledge about capturing metadata, hardware and software dependency, and problems coping with changing technology;
- Employees in the College shared their knowledge/ know-how with colleagues and others in limited ways through Web 2.0 platforms; and
- The knowledge in the College was sometimes distributed in informal ways through social networking, but normally in formal ways through e-mail.

6.2.5 Tools, methods and techniques used for knowledge assessment and knowledge acquisition at the MCNY library

- The library used a conventional Integrated Library System (ILS) (powered by SirsiDynix);
- Library personnel were trained on the management of the ILS;
- The library assigned experienced individuals to the student interns and work study students to help them find their way in the duties assigned;
- The library extracted the experiences of its experts and shared them to improve its service;
- The employees of the College and the library regularly informed each other about positive experiences and successful work methods;
- Librarians regularly attended webinars in which they were free to discuss their methods of working;
- Librarians rotated duties on a limited scale in order to distribute and share their know-how;

- Librarians were available to provide information literacy and library orientation classes as a means for knowledge exchange across individuals in the various organizational levels;
- MCNY library employees actively participated in professional networks or associations such as through ACRL, ALA, NyLink, and METRO membership for knowledge acquisition;
- MCNY library consulted with experts when important skills/information were not available in-house, such as with the running of the ILS;
- Employees at MCNY regularly attended courses, seminars, or other training programmes to remain informed;
- MCNY library appeared to consider competing sources of information and knowledge, such as Google and Wikipedia, as sources of inspiration for developing new methods of service provision or enhancing the current service;
- The library regularly used brainstorming sessions for problem solving;
- The library regularly collected information about the needs of its users;
- The library sometimes conducted knowledge gap analyses especially as relevant to ACRL information literacy standards;
- MCNY library and the College as a whole evaluated failures and successes and "lesson learned" were set down at performance evaluation times;
- The library had available up-to-date handbooks and guides which were frequently used;
- Library employees were always informed of changes in the procedures' handbook;
- The library documented the specific knowledge and skills of its individual members;
- The library was a member of professional associations, and library staff were encouraged to benefit from the career development opportunities offered such as webinars, seminars, and workshops; and
- The library used the services of library graduate school interns to benefit from their current knowledge of library trends and practices.

6.2.6 Tools, methods and techniques used for knowledge transfer at the MCNY library

- The library provided information literacy classes as reflected by the some questionnaire respondents who were aware of the services provided;
- The library provided information literacy classes according to the needs and requirements of teaching faculty;
- The findings of the study show that the potential advantage of library instruction classes offered by the library was not taken up sufficiently enough even when efforts to publicize them were there;
- Library problems, failures, and doubts were discussed openly amongst library staff with the aim of coming up with possible solutions;
- New ideas led to re-design of work methods and processes in the library;
- Library staff members were assigned to new projects such as creating online tutorials depending on know-how and availability;
- The library endeavoured to find knowledge combinations that contributed to its identity such as by working with student interns from library schools in New York City;
- Employees at MCNY were sometimes rewarded or recognized for developing new knowledge and testing new ideas as was the case involving the current study;
- The library promoted and encouraged a learning climate among employees;
- The MCNY library provided comprehensive resources to support the development of important ideas and knowledge in the College curriculum;
- The library used the knowledge and experience of experts from other departments, for example, collaboration with the webmaster to make content changes to the library website; and
- Library staff regularly shared their knowledge amongst themselves.

6.3 Conclusions

In this section the conclusions of the study based on the findings are provided. Following the suggestion of Bryman (2004), the conclusion returns to the research questions and spells out the implications of the findings and for KM theory introduced in sections 2.6 and 2.14 of Chapter Two. According to Powell (1997: 11), "the truth of the conclusion obviously depends on the truth of the premise….". The research findings in this case were the premise on which the conclusions were made. Leedy and Ormrod (2010: 296) point out that "the conclusions should be entirely supported by the data presented". The conclusions were drawn according to the order in which the research questions were stated in Chapter One, section 1.4.1. In drawing conclusions, only the major findings that directly addressed the research questions were discussed.

6.3.1 Conclusions on the MCNY understanding of knowledge management

At MCNY, the field of KM was fairly new, and this partly explains why it did not appear to feature in practice. This research has shown that it is a concept that was understood more by the administrators than by other employee categories. If the assertion by Addleson (2000: 156) that "action and decisions follow understanding" is to be taken into consideration, then it follows that MCNY had the capacity and potential to use KM practice as a basis for activities.

Abbot (2004), taking a Popperian view in looking at information science suggests that all knowledge should be continuously subjected to tests and evaluations, to rational and continuous criticism because it is subjective. Thus, an understanding of KM in itself is not sufficient for instituting it. It takes research and a detailed assessment of institutional needs before venturing into a new field that is unclear to a lot of people. Despite the vagueness of KM, this research concludes that using its principles had potential in enhancing the quality and value of service that the library provided.

6.3.2 Conclusions on the knowledge needs of the MCNY community

The study confirmed that KM seems to be made of various organizational practices requiring changes in policies and work routines. It also confirmed that knowledge, in practice, was most often defined as tacit knowledge in spite of the problems of understanding what it meant. Explicit knowledge was included in those initiatives where the focus was on managing tacit knowledge for purposes of converting it into explicit knowledge, such as in College archival documents, handbooks, and other institutional documents. The shortcoming was revealed in the limited sharing of tacit knowledge as expressed by inadequate processing of the documents, meaning that their retrieval was complicated.

The study established that knowledge at MCNY was not properly managed to facilitate the implementation of competitive programmes for surviving in a knowledge-driven environment. The findings of the study also indicated the lack of a systematic way of organizing Constructive Action projects, course-related documents, institutional documents, and other relevant documents for easy retrieval. However, it was suggested that librarians possess skills that include the identification of knowledge needs, helping to distinguish between information and knowledge, which can facilitate a broader and more inclusive KM initiative.

By creating and building a sustainable institutional repository, it is a conclusion of this study that the library can archive the digital output of the College's research, as well as provide timely electronic access to material previously available only in print. Thus, the librarian is one of the best placed individuals to preserve and manage organizational memory (OM) in support of the competitive goals of MCNY. The lack of proper OM preservation and management may compromise the ability of the College to make decisions that place it in a competitive advantage.

6.3.3 Conclusions on the knowledge retention policies, practices and gaps are in existence at MCNY

Findings on the current means and processes employed to make information contained in records accessible indicated the absence of policy guiding access and contribution to institutional knowledge. The absence of policy implies that employees could have sometimes not been aware what information and knowledge was available to help them effectively fulfil their job requirements, and even when they had valuable knowledge they lacked guidance on how to preserve it effectively.

The new information environment is leaving librarians with no option but to re-tool. Among the re-tooling options is the use of KM principles. It remains important for libraries to be clear about what they intend to project to their user communities before they can put any KM tools into use. The effort by MCNY librarians to combine traditional and the Web 2.0 worlds appears to have the potential to provide access to professionally evaluated, high quality library material. This type of environment has been termed the social library by Green (2008) and it operates in the modern information environment where librarians have changed their ways of providing service. In fact, this environment has resulted in changed librarians' duties that "now include information packaging and information customisation" (Teng and Hawamdeh, 2002: 195).

In the commercial sector, and increasingly in the academic world, knowledge is recognized as an organization's most valuable and powerful resource. As a resource, knowledge is used to improve an organization's efficiency and effectiveness, to create innovative solutions, and to enhance decision making capabilities. KM practices in higher education and at MCNY are actions aimed at improving the internal flow and use of information, and the library can be a major participant in these activities. Examples of such practices include the creation of a 'best practices" database, regular training and education programmes, encouragement and promotion of communication and interaction within departments and between individual staff and departments (Kidwell, Vander Linde

and Johnson, 2000). In this case, what was not obvious in the MCNY library is the mentioned “best practices” database.

If knowledge is considered as an important resource, it stands to reason that an organization's knowledge resources must be effectively managed. However, while an organization attempts to manage its knowledge, this study has shown that efforts can be constrained by a variety of influences acting as barriers. One of the purposes of this research was to identify those barriers which may have been acting as obstacles to any knowledge management (KM) efforts. Based on the results of this study, the researcher found a variety of managerial and resource-related influences acting as barriers to KM practice.

Of importance is to bear in mind that even with the best KM tool available and a mandate to employees to make extensive use of it, if they feel it is not part of their jobs, and themselves, the effort will not yield any desired results. KM practice need not be based on the preconception that an organization can mandate people to share their knowledge. It is likely that individuals would be willing to share their knowledge because they want to, not because they have been told or coerced to do so. This conclusion is supported by results to the questionnaire question about who owns knowledge acquired in one’s present job. The fact that 14 out of the 60 respondents (23%) were positive that the knowledge they had belonged to them alone suggests that knowledge sharing can only be encouraged, for useful and successful results. This could result in the development of a framework for sharing instructional practices that include the work of librarians – an important component of KM strategy.

6.3.4 Conclusions on the modern technologies in use at MCNY that enhance the environment for knowledge management practice

One of the most important aspects of KM is to remove the technical barriers to knowledge contribution. The focus must be on extracting knowledge from the output of the applications that are already in use. A new information environment means that there

is a conglomeration of information (knowledge through learning, experience or instruction), organizations, or systems/ conditions for the processing and/ or dissemination of information. Tools and technology should not be an impediment that would not allow employees to share their knowledge. On the contrary, they should be powerful enablers to get people to share more, not less, of their knowledge. Thus, the library participated in giving basic instruction on the use of technologies that were in use whenever the need arose, such as in the use of Microsoft Office applications, and in the use of the electronic databases.

6.3.5 Conclusions on the tools, methods and techniques used for knowledge assessment and knowledge acquisition at the MCNY library

The tools, methods and techniques used for knowledge assessment and knowledge acquisition to enable knowledge behaviours that enhance the value of library resources by the MCNY library as reflected by the data interpreted included:

- for staff to share what they know and help each other to learn;
- having open and rigorous dialogue between and among each other;
- speaking one's mind respectfully and openly;
- finding out whether certain practices and procedures have been used before and using what has been done rather than creating something anew;
- linking up with people outside the MCNY library to see if they are doing something the library can use, and to get new knowledge;
- seeking out the best individuals to help with tasks not well understood;
- trying to combine ideas from different fields such as from IT, student services, and from the library, thus forming teams to collaborate on projects;
- recognizing others for their intellectual and professional effort;
- willingness to share the good results and taking responsibility for failure;
- being trustworthy and fostering trust; and
- checking trusted information sources.

The SECI model of Nonaka and Takeuchi (1995) as discussed in Chapter Five section 5.2.4 seems relevant in the current information environment for the MCNY library. This is because the inherent use of the originating *Ba*, the interacting *Ba*, the cyber *Ba*, and the internalising *Ba* was reflected in the innovative ways the library tried to project its service.

6.3.6 Conclusions on the tools, methods and techniques used for knowledge transfer at the MCNY library

In the library, the study indicated that knowledge transfer was through online and face-to-face means. It was both formal and informal. Knowledge transfer ensured the exchange of knowledge between individuals in the library and departments in the College, but the library remained open to more intense and more regular information flows.

In addition to the techniques for knowledge assessment and knowledge acquisition mentioned above, this study considered information literacy as a sub-set of KM skills. The reason MCNY library wanted to give information literacy classes was to create conditions for the MCNY employees to appreciate the value of information transfer because it did not appear to be happening in a robust manner. These classes were also to satisfy the requirements of the Middle States Commission on Higher Education specifications that coincide with the ACRL expectations of higher education librarians to help enable all students and faculty become information literate.

The fact that the information literacy classes were not taken up sufficiently implied that the MCNY librarians needed to re-focus their attention on how they were providing their service. The reasons for not taking them up may have included a lack of a policy that requires that library instruction be embedded in the curriculum, an apparent low priority accorded to in-depth academic research, and a possible lack of regular follow ups on quality scholarly research that would have required library resource use included in Constructive Action projects.

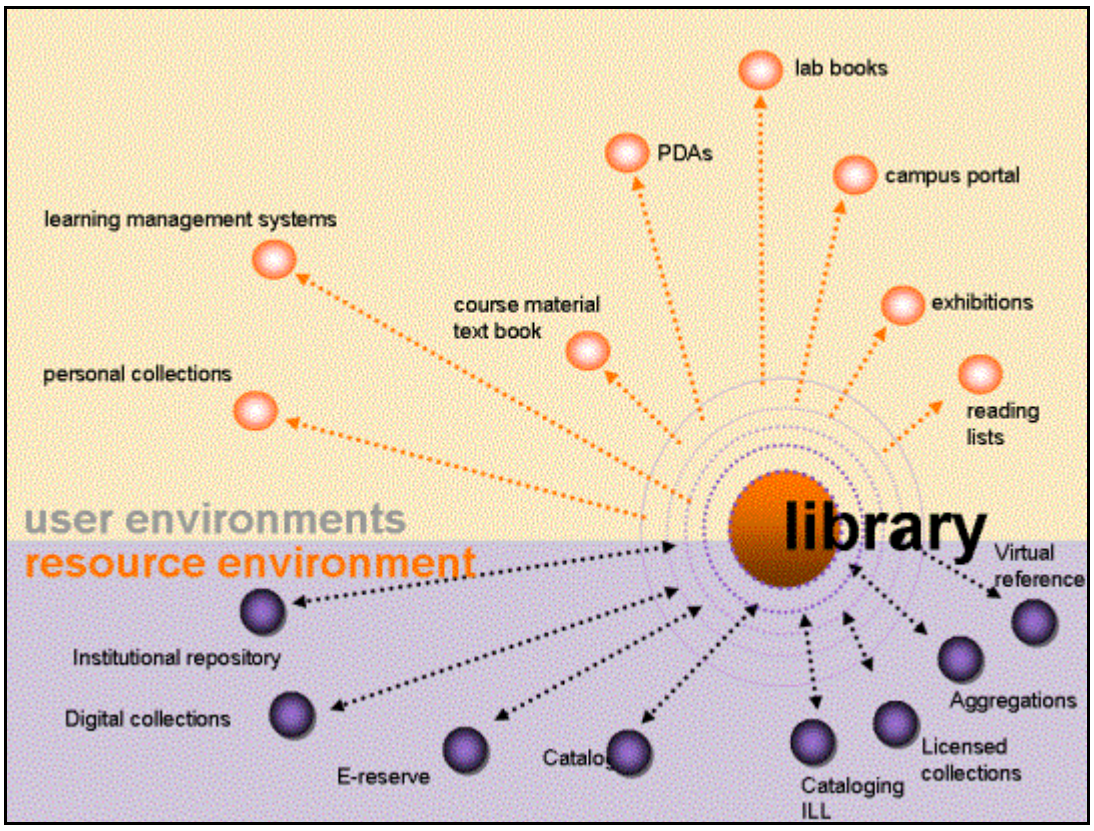
6.3.7 Overall conclusions on the research problem

The aim of the study was to examine current library service at MCNY in order to establish how to enhance the quality of service in a fast changing information environment. The study also established that despite the introduction of the Web 2.0 embedded in library databases, the current use of library resources at MCNY was still low. KM was investigated for its possible application. Concluding from the research findings, there were indications that the College faced some challenges that included: inadequate understanding of what KM meant, lack of written knowledge retention policy, lack of knowledge sharing policy, lack of policy for guiding access to College documents and records, lack of organized storage space for the College archive, and that led to scattered documents in several locations, and under usage of library resources.

This study concludes that the library is the department to be the involved with issues relating to the creation and maintenance of an institutional repository, maintenance of digital collections of the College, e-reserves, library catalogue maintenance, availability of inter-library loans facilities, management of licensed collections such as ebrary and net library, maintenance of databases such as EBSCOhost, and the provision of virtual reference services. The College community could benefit from this by being able to create personal knowledge and information collections, organizing course materials and reading lists, having access through their portable devices and through a campus portal.

This research concludes that the ideal place of the library can be a blending of a well managed resource environment and a user environment as depicted in Figure 82 by Dempsey (2006). The users of the whole institution could get relevant knowledge and information, while librarians learn and participate in inputting and organizing information and knowledge, enabling continuous knowledge creation and innovation.

Figure 82: The library as a blending of social and academic spaces (Dempsey, 2006).



White (2004) suggests that KM has benefits and risks, and the researcher sees the suggestions as part of conclusive statements for libraries. Amongst benefits (pros) are:

- Better ROI (Return on Investment);
- Improved measures of performance;
- A greater understanding of organizational goals;
- Lesson learned on organizational change;
- Knowledge of long-serving staff is retained within the organization;
- A deeper understanding of user's requirements through constant evaluation of the services and its improvements; and
- An opportunity to see ourselves not just service-oriented, but mostly value-oriented.

Risks (cons):

- Hard to capture knowledge and manage it;
- Difficulty to embed KM strategy into an organization's existing strategy;

- Fear of staff moving out of their "comfort zone" because of the knowledge they possess is passed on to colleagues;
- Financial constraints for knowledge sharing incentives;
- Protection issues are not well addressed in an organization; and
- Possible fear amongst library directors to embark on a new venture of KM, because of its infancy in development.

6.4 Recommendations

The study identified various factors which affected KM practices at MCNY. The study therefore makes recommendations to address the KM issues identified by the study in order to enhance the value of service offered by the library. The recommendations made address each of the research questions of the study.

6.4.1 Recommendations on the MCNY understanding of knowledge management

If the library were to spear head a KM guided way of operating, that would take a lot of marketing and justification for it to the whole College. This is because it is a new concept and has to be considered as such if it were to be considered as an operational guide in the academic environment. That may be the way forward for MCNY librarians. This is because in the new information driven economy where there is "emphasis on open source and on-demand services" (Dempsey, 2006), librarians need to keep abreast of such major developments so that they remain some of the key people to advice on proper and fair use of these information sources and resources especially in an academic environment.

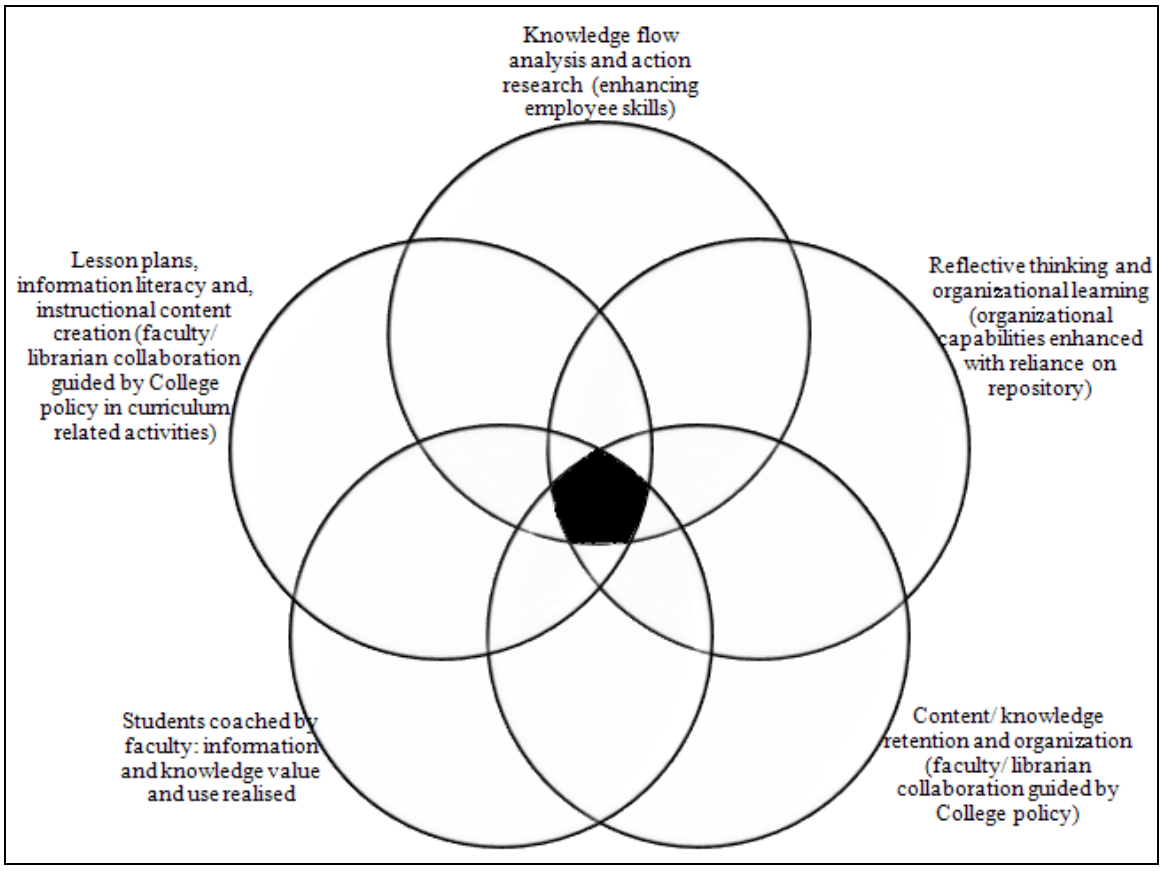
This research has the potential to advise MCNY librarians on finding the best way forward to enhance the value and quality of their service, as KM practitioners. This is even more relevant in a world of abundant online social networking habits where "the library is one source only of materials for the user, it is not necessarily at the centre of their information world" (Dempsey, 2006).

6.4.2 Recommendations on the knowledge needs of the MCNY community

The knowledge needs of MCNY that required the input of the library were viewed as existing mainly in the capture and organization of knowledge. It was, however, necessary for the College to identify the issues identified as of greatest relevance and urgency in terms of knowledge required. That way, it would be possible to identify topics that were already fully covered by the currently used tools, those that were not addressed, or those that were only insignificantly addressed by the existing tools. Where significant knowledge gaps could be detected, there would be need to fill them. Based on criteria such as relevancy, lack of sound information from other sources, costs of accessing knowledge and knowledge of great interest to MCNY, priority would be accorded to the knowledge topics.

The practical situation would be an interrelationship between the efforts of faculty and the library as indicated in the shaded area of Figure 83, with direction and support provided by administration for the sake of upholding the MCNY educational goals and values. That way, knowledge concerning everything relating to MCNY would be retained, organized, and accessed for use as appropriate. That becomes a form of research archive with the potential to raise the profile of the College, showcasing its research and education results, while managing its information and knowledge assets.

Figure 83: Working towards knowledge management practice to meet institutional goals at MCNY



6.4.3 Recommendations on implementing knowledge retention policies, practices and finding gaps at MCNY

The study findings reflected the lack of a knowledge retention policy for the management of organizational memory, and that needed attention. Knowledge retention was likely to happen in an environment conducive to knowledge sharing. A knowledge sharing culture would therefore be crucial to the success of KM. Sharing the view of Keeler (1999: 22), some of the recommended key characteristics of a knowledge sharing culture in an organization are that:

- top leadership sees knowledge as a strategic asset and provides incentives and support for knowledge management processes;

- the organization focuses on the development and exploitation of its knowledge assets;
- tools and processes for managing knowledge are clearly defined;
- knowledge creation, sharing and use are a natural and recognized part of the organization's processes, not separate from normal work processes;
- groups within the organization cooperate instead of compete with each other;
- knowledge is made accessible to everyone who can contribute to it or use it;
- rewards and performance evaluations specifically recognize contributions to, and use of, the organization's knowledge; and
- communication channels and a common technology infrastructure that enable and enhance knowledge management.

6.4.4 Recommendations on implementing modern technologies at MCNY that enhance the environment for knowledge management practice

The MCNY move towards more distance learning-based instruction, starting from 2010, could benefit from a KM type of approach that uses Web 2.0 applications. The availability of online tutorials and webcasts that guide students in the use of electronic resources, for example, can enhance information literacy instruction.

The use of such a Web 2.0 application as delicious.com enables the accumulation and organization of all resources as tags in an individual's delicious.com account. Resources discovered with the use of webquests, for example, can all be organized in one place. The use of webquest style of instruction has the potential to enable students to make material gathered on the web their own, and integrate the data from their own practical experiences into their Constructive Action projects, but at the same time providing further validation for their conclusions from mostly web sources. This requires a certain amount of creativity and critical/reflective thinking to be successful. Faculty and librarians can provide coaching for this.

The podcasts of research tutorials posted by the library can be downloaded to individual iPods or saved in multiple forms. These have the potential to work better when they are subject specific, implying librarian/ faculty collaboration.

6.4.5 Recommendations on implementing tools, methods and techniques for knowledge assessment and knowledge acquisition at the MCNY library

This research established that KM is a tactical response to the transformation to an information driven economy facilitated by planning, implementing, and monitoring knowledge related activities of an organization (Lloria, 2008). Web 2.0 refers to communication networking that is driven by users (Anderson, 2007a; Carpenter and Steiner, 2005; Harris and Lessick, 2007). Where KM and Web 2.0 merge is in knowledge and information sharing and dissemination. Thus, in the current information environment, a discussion that relates to KM cannot be complete without acknowledging the Web 2.0 presence and impact. In a library, when discussing Web 2.0, the desire to get feedback, understand user habits, improve library service, provide attractive working spaces for users, prompts one to want to use KM principles and tools because their functionality has the potential to enhance the value of the library. Tredinnick (2006) suggests that the already existing technologies in libraries can be integrated with Web 2.0 technologies to share and use information more creatively. The real question that has been realized from this study is to be clear about intentions before deciding on a Web 2.0 tool to use.

From this study, one recommendation is that even when the library did not have enough manpower to monitor or carry out all the duties that a fully functional library could, library user feedback can be used to improve products/services in the library. While some interview participants noted that the factors contributing to the inadequate state of library service included the negative attitudes and lack of awareness of the importance of library resources by some of the faculty, the library can use existing know-how and collaboration in a creative manner for new applications. The library can also continuously attempt to discover the service problems that cause gaps between targets and achievements. It is therefore practical for the library to try to counter dysfunctional beliefs within the

College by utilizing multi-disciplinary teams to perform tasks and/or make decisions. Additionally, through classifying documents, the library has capabilities to integrate its knowledge across different subject areas, thus provide knowledge in a seamless manner.

At the MCNY library, this research suggests the need for KM strategies that include participating in the establishment of, and maintaining a document repository (Singh, 2007; Wikgren, 2005); being major participants in the development of a knowledge portal; having library exit interviews or incorporating those individuals that are retiring into information collection (Barquin, 2001); supporting organizational learning and training (Daud, Rahim and Alimun, 2008; Stankosky, 2005; Rowley, 2001). While a repository helps maintain consistency if faculty and librarians have access to it that reveals teaching/ instruction content, patterns and progression from year to year, a knowledge portal is a platform that enables linkages to the said repositories in a unified, seamless way.

The digital assets would include student Constructive Action projects, curriculum documents and course development portfolios, the Audrey Cohen archive on the College's history, self-study documents, MCNY library resources, and student handbooks, student and staff information. Varying profiles of individuals who have access can be set. It is in the interest of privacy, security, and ownership of information and knowledge that the local computing resources be used. This implies IT/ systems personnel that are committed to that purpose while also overcoming the potential for users creating loopholes in the College security system. As a long-term plan, any involvement of the library in this type of activity can be a viable option of enhancing place of the library at MCNY.

MCNY library can participate in the development and implementation of a process to capture the undocumented knowledge of library employees, besides that of library users, for contributing to a knowledge portal. This can partly be enhanced by encouraging library employees to create and collect guides that relate to their job functions wherever possible and practical, sharing of expertise, and as well as through cross-training. The

process enables the identification of critical "at risk" knowledge and skills, especially those associated with impending attrition, evaluating the risk associated with losing this critical knowledge and skills while focusing on areas of greatest risk, developing and implementing knowledge retention plans for managing this risk. This partly constitutes the capture of OM or what is referred to by Lee (2005) as the knowledge resources management in a library.

Additionally, the library needs to collaborate more strongly with faculty in creating relevant information literacy classes. According to Benton (2009), this is essential because:

> professors and librarians are socialized into different professions with different values that can make us mutually incomprehensible: one emphasizes individual scholarly productivity; the other looks to provide the context in which that work can take place. The two professions are also separated institutionally by different chains of administrative accountability, separate reward systems, and separate budgets. Librarians sometimes seem remote from the usual politics of faculty life, and, increasingly, there are fewer opportunities for collegial exchange between faculty members and librarians.

This way, even the disruptive behaviour, noise, and misuse of library facilities and an inherent culture of not respecting the library mentioned in interviews to a large extent could fall away if the system worked as one.

6.4.6 Recommendations on implementing tools, methods and techniques for knowledge transfer at the MCNY library

It has been recognized that modern library users are comfortable using the spaces provided by information-based industries (Anderson, 2007a; Harris and Lessick, 2007). Collaborative, interactive workspaces have become relevant in this information environment (Anderson, 2007a; Sadeh, 2008) and librarians have had to find ways of making use of the new technologies to best advantage. In fact:

> we're moving from a technology-centric strategy to one in which the real needs of our clients must predominate. Aligning technology with user behaviour no longer suffices to ensure success. We need to understand, and understand deeply, the role of the library in our end-users' lives, work, research, and play (Abram (2008).

This collaboration would be with the use of such activities as web quests, and more seamlessly embedding information literacy instruction into the curriculum. In that environment, information literacy instruction would incorporate Web 2.0 tools that can be used by the library to complement the already existing service. Information literacy features consistently because if aligned closely with the activities that take place in classroom processes, then it ceases to be isolated from the whole big picture of teaching and learning. This approach is based on the mission of MCNY to foster personal and professional development, promote social justice, and encourage positive change in workplaces and communities (MCNY, 2009c). The end result could be an accumulation of MCNY knowledge assets that the library helps in keeping organized. In other words, librarians "support transformation, not transactions" (Abram, 2010).

Some of the ways that library users can use Web 2.0 functionality include the capability for tagging the online public access catalogue (OPAC) (so that they have a set of records that they prefer to use readily accessible to them in a tag cloud), or by allowing the use of sites like Flikr for sharing pictures that are relevant to the College, or to have a social networking account like Twitter, Facebook or MySpace or delicious.com or any of the numerous social networking platforms that are currently in use, to reach out to those that are comfortable with use of these facilities. For example, by creating a free account in delicious.com, it is possible to put together all resources including library links, useful websites, web quests, Facebook, and all links that an individual may want. Even a tagged library catalogue can be included as a tag in delious.com.

In using the library website, if tagging is put in place as a function, its use would be based on lessons gained from information literacy exercises. That way, library users who use tag clouds would be doing it in an academic environment. Macgregor and McCulloch

(2006) suggest that tagging can be an effective method of organizing resources that faculty needs to support teaching, and that can in the process replace traditional subject guides. These resources are valuable if the procedures and guides on how to use them are added to the repository. This is even more valuable at MCNY where there is a larger number of part-time faculty members than full-time ones.

The mention of tag clouds suggests that librarians are now partly using cloud computing, that is, the delivering of hosted electronic services over the internet. According to Scale (2009: 10), cloud computing is:

> the sharing and use of applications and resources of a network environment to get work done without concern about ownership and management of the network's resources and applications…data are no longer stored on one's personal computer, but are hosted elsewhere to be made accessible in any location and at anytime.

With it, the focus shifts away from which devices can effectively store data and able to run applications, to which devices provide the easiest access to data and applications – which are stored at various places on the internet (Abram, 2010; Gervasi, Taniar and Murgante, 2009). By using a platform such as delicious.com that allows cloud computing in the library, librarians can invite each other into a specified closed network, add useful resources to it in a non-formal but constructive way, and in the process be accumulating knowledge for practical use as well as inherently tapping the knowledge in the heads of individuals. This type of knowledge transfer has the potential to help bridge the knowledge gap that sometimes develops when employees go into retirement.

The concerns of librarians become centred on how libraries can use the cloud to both personalise and localize the user's information seeking experience (Abram, 2010; Gerke and Maness, 2010). In an environment where there are financial constraints, the question of the cloud saving the library money and resources by using computing devices more efficiently becomes central. It is even more so because KM practices can be blended with cloud computing and Web 2.0 (Yang and Tate, 2009). This leads to the need to understand the ways that modern library users interact with the cloud, and how library

services may need to be modified to fit into the emerging user patterns. These user patterns have a bearing on the collaboratory work of faculty and librarians. The use of iTunes, Facebook, and YouTube that MCNY does is already a major advancement towards communicating to users of modern information technologies. The library's participation in these platforms can help prove that the physical space of the library is now complemented by the virtual space.

The institutional use of Web 2.0 tools that have been mentioned is to survive in the modern information environment that has produced a need for an approach for a visual and interactive learning environment rather than traditional teaching. As suggested by Tredinnick (2006), library technologies can be integrated with Web 2.0 technologies to share and use information more creatively. Essential in this approach is problem-based learning in order for it to be meaningful. It represents the ability to identify a problem, analyse possible solutions, implement a plan, and present the solution. Information literacy complements problem-based learning and both concepts enhance the growth of skills that support lifelong learning - an important component of the teaching goals at MCNY. The learning outcomes in this case include the gaining of search expertise in identifying the problem and utilizing appropriate keywords for searches, selecting relevant electronic resources, performing simple, field and Boolean searches, as well as evaluating the relevancy of search results from commercial databases and websites (Blummer, 2007). The reason for creating these education platforms is to encourage creative thinking on the part of librarians and faculty so that they become more prepared to impart these skills to students.

Assessment for problem-based learning exercises would contain a rubric, a form of measurement that allows faculty and librarians to evaluate student performance through the appearance or absence of specific criteria (Blummer, 2007). The rubric utilized in an information literacy learning environment rates student performance on activities that include the identification of the problem, the databases and websites selected, the search strategy employed, the presentation of the results, and the contents of the bibliography. The researcher therefore suggests that librarians and faculty co-teach a few sessions in

the library, where they guide students in finding and accessing materials. This helps encourage discussions about ethical and legal issues associated with acquiring and using borrowed text, images, and a whole range of material that users have access to, and this reinforces KM practice in a Web 2.0 environment.

Web quests, "an inquiry-oriented activity in which some or all of the information that learners interact with comes from resources on the internet, optionally supplemented with videoconferencing" (Dodge, 1997) were suggested in interviews as a way for librarians to get involved with what faculty is doing. They are suitable in some courses, but not in all. This approach has cross-curriculum implications and would require proper analysis and organizing in order to be effective. This way, librarian-faculty partnerships can promote the development of information literacy skills among students especially in an online environment. Maybe this method could go a long way in augmenting research support for distance learning students and the use of relevant library resources, thereby altering database usage statistics as viewed in Chapter Four. Rather, constant and increased usage patterns could develop.

An important recommendation is for the library to have a combination of the traditional and the Web 2.0 worlds to facilitate and provide access to professionally evaluated, high quality electronic material, including open access information. The state of library service at MCNY is such that these are concepts that could result in increased value in service provision. A blend of all the mentioned strategies (Nonaka and Takeuchi, 1995) is perceived to be the ideal, but requires the involvement of more individuals than library personnel alone. Research results suggest that if KM initiatives become more central to MCNY's success at meeting its goals, it would be part of practice to link each employee's success to their contribution to the program. Thus, behaviours that are supportive of enhancing the value and quality of library service, if linked to the way that instruction is given at MCNY, can have the potential to enhance the initiative's success. As such, the library has to conduct an assessment of its KM before setting the success criteria for the initiative. This helps focus on relevant areas.

Having a formal written knowledge retention strategy in place is necessary. Because this is mainly a human resources department and IT function, the library as a department can only make recommendations on what it views as its skills base, how it views succession planning, and influence policy on retaining older employees. Librarians at MCNY therefore need to re- tool and constantly re-skill, rather than limit services to discovery of information and information literacy. This redefines the work of administering the library, technical services and reference services librarians who then have to participate in making sure that the use of technology enhances the quality of library service, rather than trivialize it. The library also needs to justify its existence because the current difficult economic times require that. Although not easy, one of the ways to do this could be undertaking a return on investment exercise (ROI).

Since it was expressed in the questionnaire results that the concept of knowledge was difficult to clearly articulate, maybe systemic change resulting in employee re-orientation towards KM principles and practice could help everyone understand what knowledge was/ is critical to the College. Maybe instituting a reward system for sharing and useful contributions would then become more meaningful. Rewards can come in the form of bonuses, recognition, encouragement, and if this is non-existent, individuals remain apathetic. However, it was also important to bear in mind that instituting rewards would not necessarily produce the desired results. It can only create an enabling environment for knowledge creation and transfer. This is because there are certain values that must be honoured in a culture if the organization's members are to feel free and motivated to share what they know and to collaborate around their shared knowledge (Lloria, 2008; Stankosky, 2005).

Another recommendation is in agreement with Jashapara (2005), who shares a similar view as Rowley (2001), in suggesting that it is important for libraries to include KM practices as they are made up of organizational learning, systems and technology, as well as culture and strategy. This is even more relevant in the context of MCNY library's educational and teaching goals. Jain (2007: 379) contributes to this view by pointing out that "for any organisation aspiring to practice KM, it is important to be a learning

organisation, as KM calls for a paradigm shift from traditional librarians to modern information professionals". Rowley (2001) echoes the same view with her concept of a learning organization. The MCNY library can enhance its quality of library service by allowing itself to be a learning department and by including more KM principles and practices in its operations. Much as KM may not be a direct focus of the College as a whole, using KM principles that work seem to be effective in the enhancement of library service. A learning organization is distinguishable from KM as illustrated in Table 14.

Table 14: The learning organization and knowledge management

Learning organisations	Knowledge organisations
• Based on a building metaphor • Learning as a process • Maintaining and developing tacit knowledge • Key focus is human relations and distribution, and cognition • Implemented through organizational projects, including focus on culture and structures • System based view of the firm	• Based on a mining metaphor • Knowledge as a resource • Knowledge processing in terms of tacit to explicit knowledge • Key focus is knowledge community • Implemented through IT projects, with attention to people issues sometimes being focused at the IT user level • Resource-based view of the firm

Rowley (2001: 231)

6.5 Implications of the research for theory and practice

Major changes such as the twenty first century information driven existence have resulted in paradigm changes which leave no discipline unaffected. Library science theory has been found to be in need of developing towards a more transdisciplinary approach. The study revealed that KM was not the backbone of practice at MCNY and as such, suggesting its use in the library would be dependent on institution-wide decisions. This study further shows that the use of mixed methods for data collection helped the researcher to fit together the insights provided by quantitative and qualitative research in answering the research questions.

The study contributes to the existing body of knowledge with regard to the topic in question by integrating KM practices where they are foreign to the institution and their implementation in an academic library. For this reason the contribution of this study is original. This study is important because, in libraries in particular, there are a number of practices that need further investigation due to the fast changing information environment, which are affected by social networking and the media to establish good quality knowledge systems. Thus, the findings of the present study may be of use to librarians, KM scholars, educators, researchers and students undertaking studies into KM practices all over the world.

This study has suggested librarians getting involved in the way some of the courses were offered at MCNY as an approach that could alter the teaching methods to incorporate library instruction. This suggestion had curriculum altering implications and would need to be considered as such. What is important, if any such change were to happen, is to have a database of retrievable information as a way of enhancing the knowledge available to stakeholders. That way, it would be possible to have a place instructional guides could be retrieved for re-use, tailoring, or changing/ updating. This is an instance where the input of librarians could become relevant in the organization of the knowledge.

A collaboratory approach is even more relevant where the blending of the physical and the electronic library can no longer be viewed as "silos that users experience independently" (Gerke and Maness, 2010: 27). This is an area that librarians and faculty may want to investigate whether robust use of the library resources translates into improved grades of students. In this situation, KM practice was considered a possible way of re-inventing the functions of the library especially as it already captured, codified, shared, and distributed knowledge. It was also suggested that librarians need to be involved with managing knowledge production processes that include knowledge making, knowledge creation, and knowledge discovery.

The question of the extent to which librarians can be regarded as KM practitioners at MCNY remains unclear because of different perceptions of what KM is. However, that

does not discourage librarians from considering using KM principles as appropriate. Besides the findings from this research, KM practice is a phenomenon reflected in literature reviewed about different situations and different libraries. It is therefore incumbent upon libraries to define KM in library situations and make that meaning clear to the academic community, particularly with its systemic change implications.

6.6 Suggestions for further research

The suggestion to use grounded theory, for example, for purposes of data collection and organization in the context of library research and practice is worth pursuing. This approach could also be used in calculating the ROI of the library. This is because questions still remain about how to measure the value of library service, and also how to evaluate the application of information retrieval skills to teaching situations by faculty.

The area of the use of an incentive system in encouraging knowledge creation and sharing also requires further investigation. The reason is that this includes elements of motivation theory, making it important to find out how it applies to a KM oriented organization. A knowledge needs analysis could also be useful in measuring staff skills and opportunities for training and development, institutional practices such as knowledge sharing attitude, collaboration, team spirit, rewards and recognition and staff relationship with their colleagues of all levels. This process could also include the resuscitation of the library related surveys mentioned in section 1.6 of Chapter One.

Social software brought forward a wave of richer interactions with people connecting and sharing knowledge in many more meaningful ways than before. There needs to be a balance for librarians to make their choices and select the tools they would want to work with. It means that it is important to determine if they want to use in isolation the tools they have been using already or start making use of those social networking tools that go further and beyond sharing the content, and focus as well on establishing the different relationships, connections and conversations amongst different beneficiaries of library

service. They can augment what is already available and improve on how knowledge flows.

6.7 Final conclusion

The study investigated the existence of KM practices at MCNY where the operational culture of the College was not KM. Its purpose to examine current library service in an environment where information was changing fast, and where there was competition from other sources such as the internet, has been achieved.

After discussing the implications of KM for the library, the suggestion made by Wen (2005) can be a practical way of getting the KM process in place:

> the library director should consider him/her self as the chief knowledge officer of the entire organization and should work together with the CIO, heads of the planning department, the computer and information technology center, the human resources management department, the finance department, etc. to design and develop such a system. Such a knowledge management system should be built on existing computer and information technology infrastructures, including upgraded intranet, extranet, and Internet, and available software programs to facilitate the capture, analysis, organization, storage, and sharing of internal and external information resources for effective knowledge exchange among users, resource persons (faculty, researchers, and subjects specialists, and so on.), publishers, government agencies, businesses and industries, and other organizations via multiple channels and layers.

Another suggestion comes from Branin (2003: 54) who thinks that all academic librarians:

> whether working in administration, collection management, reference, or technical services, must take on new roles as knowledge managers. In this new role, librarians are: knowledge management developers, working more closely with faculty and students to design, organize, and maintain a broader range of

digital assets; knowledge management integrators, having a more active role in the educational and research mission of the university, integrating information resources and services in course and research projects; knowledge management educators; teaching and training students and faculty information literacy and how to organize, preserve, and share their own information resources; knowledge management researchers, applying library and information science and new digital technology to create new organizational (metadata), retrieval, and storage (preservation) options.

To enhance the position of the MCNY library so that it becomes empowered to get involved with properly managing both the library holdings and the rest of the College's knowledge assets, management buy-in and support is essential. This study established that the effective implementation of KM depends largely on many factors, the most important of which are the proper and well organized methods of integrating work processes, collaborating, sharing, and developing an enabling institutional culture. In that environment, the whole College needs to focus on improving its performance by enabling learning and innovation while solving its problems, acknowledging and resolving gaps in its operations, and recognizing knowledge (comprised of people and information) as an organizational asset which has to be managed through enabling policies and institutional tools. Recognizing knowledge and information as organizational assets helps organizations to refocus on using their already existing knowledge and enables them to be innovative rather than limit themselves to best practices solutions only. That is facilitated by interconnectedness among departments including the library, employees, and systems in an organization, and enables better decision-making capabilities. In the process, the service value of the library is enhanced. Recommendations based on the findings of the study were made and areas for further research were identified.

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APPENDIX A: CASE STUDY PROTOCOL for MCNY LIBRARY

A. Introduction to the case study and purpose of protocol

1. Case study question and propositions
2. Theoretical framework for the case study
3. Role of protocol in guiding the case study investigator (notes that the protocol is a standardized agenda for the investigator's inquiry)

B. Data collection procedures

1. Names of college departments to be visited, including contact persons
2. Data collection plan (covers the calendar period for the visits, the amount of time to be used for each interview visit, questionnaire distribution, observations)
3. Expected preparation prior to visits (identifies specific documents to be reviewed and where they can be accessed)

C. Outline of case study report

1. Consideration of the practice in operation
2. Innovativeness of the practice
3. Outcomes of the practice, if any, to date
4. Chronology, references to relevant documents, and list of persons interviewed

D. Case study questions

1. The practice in operation and its innovativeness:
    a. What do librarians, faculty, and administrators understand KM to mean?
    b. What are the knowledge needs of the MCNY community?
    c. What knowledge retention policies, practices and gaps are in existence at MCNY?
    d. What modern technologies are in use at MCNY that enhance the environment for KM practice?
    e. What is the nature, if any, of collaborative efforts within the college that has been needed to put KM practice into place in the library?

f. What are the tools, methods and techniques used for knowledge retention-- knowledge assessment, knowledge acquisition and knowledge transfer at the MCNY library?

g. In what ways is the practice innovative, compared to other practices?

h. Description of how the practice is to continue after research study has ended

2. Evaluation

a. Determine the design for evaluating the study.

b. What part of the evaluation is implemented?

c. What are the outcome measures being used, and what outcomes have been identified to date?

d. What rival explanations have been identified and explored for attributing the outcomes to the effort?

Adapted from: Yin, R.K. (2003: 68).

APPENDIX B:

MCNY IRB Proposal Review Form

Date: _Oct.22,2009_____ Reviewer: all committee members___

Author of Proposal: Judith Mavodza_____

Title of Proposal: The Knowledge Management Role of an Academic Librarian in a Changing Information Environment with Special Reference to the Metropolitan College of New York

Summary: [check one]

____+_Approve

_____Approve with revisions

_____Reject

Comments: Unanimously approved

APPENDIX C: Extracts from Unisa policy on research ethics

PART 1

GENERAL GUIDELINES FOR ETHICAL RESEARCH

1. PREAMBLE

1.1 Unisa is committed to

• becoming the African university in the service of humanity

• undertaking and promoting research that will benefit all the people of South Africa

• being guided by integrity, accountability and rigour in research

• promoting an institutional ethos that is conducive to critical discourse, intellectual curiosity, tolerance and a diversity of views

• maintaining an environment for researchers in which they may be autonomous and ethical in their work

1.2 Unisa promotes high standards of scientific work and strives for excellence in research that can withstand public scrutiny.

1.3 Unisa espouses the constitutional values of human dignity, equality, social justice and fairness.

1.4 Unisa affirms the constitutional principles of academic freedom and freedom of scientific research.

2. RATIONALE

The Unisa Policy on Research Ethics aims to ensure that

• an ethical and scientific intellectual culture prevails among its employees and students

• the rights and interests of human participants are protected. This is particularly important where information gathered has the potential to invade the privacy and dignity of participants, and where participants are vulnerable owing to their youth, age, poverty, disease, ignorance or powerlessness.

• research is ethical where the following are involved: animals, genetic material, agriculture, living organisms, and genetically modified organisms which may negatively affect humans, animals, plants or the environment.

• research is ethical in increasingly diverse research areas. Examples are qualitative[1] and quantitative[2] research, and collaborative research between international researchers and host country institutions. Such collaboration raises particular ethical issues, which include the possible exploitation of vulnerable populations, intellectual property rights of indigenous people and benefit for the host country.

•ethical and scientific soundness of research is not compromised where lack of funding limits opportunities for research and force cost-saving procedures

3. OBJECTIVES

3.1 The Policy on Research Ethics is not intended to restrict or discourage research at Unisa. On the contrary, this policy aims to

• enable researchers to

- enhance their capability to undertake ethical research
- maintain their independence, especially when confronted with undue influence or pressure which may compromise their integrity or that of their research

• discourage unethical research practice

• serve as a basis for policymakers and to provide an enabling environment for the practice of ethical research

• provide an additional resource for the teaching and training of students in research

• make ethics an integral part of the planning and methodology of research

• preserve and promote the autonomy, quality, legitimacy and credibility of research

• protect and promote the rights of research participants[3] and honour their trust in researchers and research

- strengthen the research ethics review system in the University where research involves human participants, animals, or other living or genetically modified organisms

3.2 Application of the policy

3.2.1 The policy covers all activities through which research information is gathered, interpreted, processed and disseminated, for example surveys, interviews, data processing and the reporting of research findings.

3.2.2 The policy applies to all parties in research, including Unisa, researchers, students, research participants, peer reviewers, consultants, clients, funders and sponsors.

3.2.3 The policy does not apply retrospectively. However, researchers carrying out research involving human participants, animals, or other living or genetically modified organisms should report to the relevant Ethics Review Committee on the extent to which their current research complies with the policy.

3.4 This policy may be reviewed by the Unisa Ethics Review Committee when the need arises.

4. RIGHTS AND RESPONSIBILITIES OF UNISA

4.1 Unisa should respect the autonomy and academic freedom of researchers.

4.2 Unisa should create and maintain an enabling environment in which researchers may conduct ethical research.

4.3 Unisa should promote the observance of the Policy on Research Ethics and take appropriate steps for protection against pressures inimical to the observance of the policy.

4.4 Unisa may require the payment of review fees for externally funded research. The particulars are contained in Annexure "A".

4.6 All research involving human participants, animals, or other living or genetically modified organisms must have ethics clearance (from an appropriate Ethics Review Committee before it may commence. It includes research which

• is done on Unisa premises or in any of its units or uses any of its facilities

• involves Unisa employees or students in various capacities, including collaborative or multi-institutional or multi-country studies, or

• is or will be funded from Unisa funds or where funding was obtained through Unisa

4.6.2 Unisa has the right to monitor research that has been approved by any of its Ethics Review Committees and to require submission of regular reports or other information about the research. It may impose disciplinary measures or stop research when ethical principles are violated or the integrity of the University is jeopardised.

4.6.3 In pursuance of this right, the Unisa Research Directorate registers all research that obtained ethics clearance.

4.6.4 Unisa is accountable only for research which has been approved by any of its Ethics Review Committees.

5. RIGHTS AND RESPONSIBILITIES OF RESEARCHERS AT UNISA

5.1 Researchers have the fundamental right to academic freedom and freedom of scientific research.

5.2 Integrity in research

5.2.1 Researchers should be competent and accountable. They should act in a responsible manner and strive to achieve the highest possible level of excellence, integrity and scientific quality in their research.

5.2.2 Researchers have a right, as well as a duty, to refrain from undertaking or continuing any research that contravenes the Policy on Research Ethics, violates the integrity and/or validity of research and/or compromises their autonomy in research. If they feel that the policy or ethical principles are being violated, or that the study is unethical, they should make all possible efforts to make corrections. These would include reporting to the relevant Unit Ethics Review Committee. (The particulars are contained in Annexure "A".) In the event of failure of remedial measures they should terminate the study or end their involvement in it.

5.2.3 Researchers may undertake only such research involving human participants, animals, other living or genetically modified organisms as has been approved by an appropriate Ethics Review Committee.

5.2.4 Researchers should undertake only such research as, according to their understanding, will benefit society and contribute to knowledge on the subject. They are advised to use resources judiciously and to avoid the unnecessary duplication of research.

5.2.5 Researchers have a right and a duty to make all necessary efforts to bring the research and its findings to the public domain in an appropriate manner and at an appropriate time. The publishing of research findings should be done in a manner which will not harm research participants or their communities.

5.2.6 Researchers should not undertake secret or classified research, any secret assignment under the guise of research or research whose findings are to remain confidential. They should endeavour to convince their client(s)/sponsor(s)/funder(s) of the importance of publishing research findings in scientific journals.

5.2.7 Researchers have a responsibility towards those involved in or affected by their work. They should make reasonable efforts to anticipate and to guard against the possible undesirable or harmful consequences of research. They should take reasonable corrective steps when they come across misuse or misrepresentation of their work.

5.2.8 Researchers should be honest in respect of their own actions in research and in their responses to the actions of other researchers. This applies to the whole range of research, including generating and analysing data, publishing results, and acknowledging the direct and indirect contributions of colleagues, collaborators and others.

5.2.9 Researchers may not commit plagiarism, piracy, falsification or the fabrication of results at any stage of the research. The findings of

research should be reported accurately and truthfully, and historical records and study material should be preserved and protected.

5.2.10 Plagiarism, falsification, the fabrication of results, and scientific misconduct in general are regarded as serious disciplinary offences. These will be investigated by the relevant Ethics Review Committee and the findings reported to Unisa or the research sponsor. See Annexure "A", the Disciplinary Code for Employees and the Student Disciplinary Code.

5.2.11 Researchers undertaking research involving humans, animals, other living or genetically modified organisms may be requested to report regularly to the relevant Ethics Review Committee. They should inform this committee immediately about any unexpected adverse events.

5.3 Relationship among researchers

5.3.1 Principal researchers are responsible for the ethical conduct of research by juniors, assistants, students and trainees under their supervision. At the same time juniors, assistants, students and trainees have a responsibility to act ethically and to observe the Policy on Research Ethics.

5.3.2 Juniors, assistants, students and trainees have a right to receive, and principal researchers have a responsibility to provide, proper training and guidance on all aspects of research, including ethical conduct. The principal researchers should delegate to juniors, assistants, students and trainees only those responsibilities that they are reasonably capable of performing on the basis of their education, training or experience, either independently or under supervision.

5.3.3 Researchers should not engage in discriminatory, harmful or exploitative practices or harassment. They should not impose their views or beliefs on or try to seek personal, sexual or economic gain from anybody, including other researchers, juniors, assistants, trainees or students.

5.3.4 Researchers should not deceive or coerce other researchers, including juniors, assistants, trainees and students into serving as research

participants. Students, either as research participants or as research assistants, have the right to end involvement in the research without having to face adverse consequences.

5.3.5 Students working on research as a tuition requirement should not be exploited by advisors or mentors, nor used as cheap labour.

5.3.6 In addition to researchers and students, other individuals such as administrative employees of Unisa who may have access to data or identifying information, should be briefed on ethical issues and the Policy on Research Ethics, including the participants' right to confidentiality.

5.4 Data sharing

5.4.1 Researchers should ensure the protection of the interests of co-researchers and participants, including participants' right to confidentiality, when sharing or making public available data in any form.

5.4.2 Data which do not identify participants and which are in the form of anonymous[4] or abstracted facts may be commonly shared, if necessary even before publication of the study, among researchers and peer reviewers, and may be made available to the public.

5.4.3 As far as possible, researchers should ensure that relevant findings of the research are taken back to the research participants or communities in a form and manner that they can understand, and which will not cause them harm.

5.5 Reporting and publication of research

5.5.1 Reporting of research findings advances scientific knowledge. Researchers who conducted the study have the right and the duty to publish research findings in scientific journals, books or other media. When they agree to delegate this responsibility to other individual(s) or organisation(s) they should do so only if they have received a mutually agreed commitment to publish or disseminate the results within an agreed period, with an agreed content and in an agreed manner.

5.5.2 Where there is a conflict between the advance of scientific knowledge and the protection of intellectual property (e.g. by way of patents) researchers should endeavour to convince the patent holder of the importance of publishing research findings.

5.5.3 If a client/sponsor/funder requires nonpublication of results carried out on humans, animals, or other living or genetically modified organisms, or that it must give prior approval for the manner and content of reporting, such research proposal may be disapproved by the relevant Ethics Review Committee. If the request not to publish is based on strategic or other reasonable grounds, the committee may consider nonpublication of results for no more than one year following the completion of research. Input from the relevant college/institute/centre should be sought where there is a request not to publish. See Annexure "A".

5.5.4 The results should be reported irrespective of whether they support or contradict the expected outcome(s).

5.5.5 Researchers should disclose in their publications the source(s) of funding and sponsors, if any, unless there is a compelling reason not to do so.

5.5.6 Researchers should in their publications explain the methodology used, as well as how ethical dilemmas encountered were resolved.

5.5.7 The following guidelines should be followed for giving authorship credit while reporting the research in any form:

• Authorship, and its sequence in case of more than one author, should be based on the quantum of contribution made in terms of ideas, conceptualisation, and actual performance of the research, analysis and writing of the report or any publication based on the research. Authorship and its sequence should not be based on the status of the individual in the institution or elsewhere.

• All other individuals not satisfying the criteria for authorship but whose contribution made the conduct and completion of research or publication possible should be properly acknowledged.

• A student should be listed as principal or first author on any multiple-authored publication that substantially derives from the student's dissertation or thesis.

• When data or information from other studies or publications is quoted or included, appropriate credit should be given.

5.5.8 When results are disseminated through the popular media, researchers should endeavour to ensure that media people comprehend the limitations and implications of research results, and that distortions and misrepresentations in media reporting are minimised.

5.6 Peer review

5.6.1 Apart from ethical review, peer (scientific) review is an essential part of research. The purpose of peer review is to improve and advance research, and to facilitate observance of ethics. Researchers should be encouraged to subject their own work to such a process.

5.6.2 Researchers should be encouraged to make themselves available as peer reviewers for research in the fields in which they have adequate knowledge and expertise.

5.6.3 Peer reviewers should be aware of the ethical aspects of research and publication. They have to act objectively, impartially and constructively.

5.6.4 If peer reviewers have any actual or potential conflicts of personal or professional interest with the work under review which could jeopardise their ability to undertake the review in a scientific and ethical manner, they should either disclose the same or decline to review the work concerned. In such situations, their role should be decided on the basis of the type and severity of the conflict of interest.

5.6.5 When scientific misconduct or violation of ethics is discovered, the peer reviewer should take appropriate steps to report it to the relevant Ethics Review Committee. See Annexure “A”.

7. RIGHTS AND RESPONSIBILITIES OF FUNDERS, CLIENTS AND SPONSORS

7.1 Researchers should ensure that they have an explicit written research mandate from the client/sponsor/funders in which the conditions and terms of the research are set out clearly (e.g. research problem, expected deliverables, financial commitments and time frames).

7.2 The acceptance of a mandate should be sealed by a legally binding, written contract between the parties. This contract should specify the terms agreed on, including the rights and obligations of the parties involved, and the sharing of intellectual property rights and benefits.

7.3 The position with regard to the dissemination and publication of findings from the research study should be clarified.

7.4 Researchers should recognise the right of the client/sponsor/funder to request information from them at any stage in the course of the research. However, interference that may jeopardise the scientific integrity of the study or the interests of the research participants may oblige Unisa to cancel the cooperation.

7.5 Clients/funders/sponsors should be made aware of the Unisa Policy on Research Ethics. They have the right to receive a copy of the policy and to expect that the research proposal submitted for funding or sponsorship by researchers and Unisa contains the necessary information on ethical issues and complies with the policy.

7.6 Clients/funders/sponsors should respect the Unisa Policy on Research Ethics and should not expect researchers or Unisa to undertake research or conduct which is in any way contrary to the policy.

7.7 Where clients/sponsors/funders act, directly or indirectly, as gatekeepers and control access to the participants, researchers should not devolve onto the gatekeepers their responsibility to obtain separate and informed consent from participants and to protect their rights.

PART 2

GUIDELINES FOR RESEARCH INVOLVING HUMAN PARTICIPANTS

1. BASIC PRINCIPLES FOR RESEARCH

1.1 Moral principles

Unisa promotes the following four internationally established and accepted moral principles of ethics as bases for research:

• autonomy (research should respect the autonomy, rights and dignity of research participants)

• beneficence (research should make a positive contribution towards the welfare of people)

• nonmaleficence (research should not cause harm to the research participant(s) in particular or to people in general)

• justice (the benefits and risks of research should be fairly distributed among people). These principles are not ranked in any order of preference. In disputes a balance between the four principles should be pursued.

1.2 General ethics principles

In addition to, and expanding on, the above moral principles, the following ten general ethics principles should be adhered to by researchers. Again, the ethical principles may not, by themselves, resolve all ethical problems and dilemmas which confront researchers. Researchers may be required to balance the demands made by moral principles of research and to privilege one principle over another, depending on the context and circumstances of the research involved.

(i) ESSENTIALITY AND RELEVANCE

Before undertaking research adequate consideration should be given to existing literature on the subject or issue under study, and to alternatives available. In view of the scarcity of resources in South Africa, it should be clearly demonstrated that the research is essential to the pursuit of knowledge and/or the public good.

(ii) MAXIMISATION OF PUBLIC INTEREST AND OF SOCIAL JUSTICE

Research should be carried out for the benefit of society, and with the motive of maximising public interest and social justice. All efforts should be made to make public in an appropriate manner and form, and at an appropriate time, information

on the research undertaken, as well as the results and implications of the completed research.

(iii) COMPETENCE, ABILITY AND COMMITMENT TO RESEARCH

Researchers should be professionally and personally qualified for the research. Commitment to research in general and to the relevant subject in particular is an essential prerequisite for good and ethical research.

(iv) RESPECT FOR AND PROTECTION OF PARTICIPANTS' RIGHTS

Researchers should respect and protect the dignity, privacy and confidentiality[5] of participants and should never expose them to procedures or risks not directly attached to the research project or its methodology. Research and the pursuit of knowledge should not be regarded as the supreme goal at the expense of participants' rights.

(v) INFORMED AND NON-COERCED CONSENT

Autonomy requires that individuals' participation should be freely given, specific and based on informed consent. Direct or indirect coercion, as well as undue inducement of people in the name of research should be avoided. These act as barriers to autonomous decision making and may result in people consenting against their better judgment to participate in studies involving risks.

(vi) RESPECT FOR CULTURAL DIFFERENCES

Researchers should treat research participants as unique human beings within the context of their community systems, and should respect what is sacred and secret by tradition. Research should preferably be undertaken with, and not merely on, an identified community. In some situations the consent of "gatekeepers" may have to be obtained in addition to that of research participants.

(vii) JUSTICE, FAIRNESS AND OBJECTIVITY

Criteria for the selection of participants of research should be fair, besides being scientific. Easily accessible individuals or groups should not be inordinately burdened with research being carried out repeatedly on them.

(viii) INTEGRITY, TRANSPARENCY AND ACCOUNTABILITY

The conduct of research should be honest, fair and transparent. Researchers should be honest about their own limitations, competence, belief systems, values and needs. The contribution of other researchers or members of the research team should be properly acknowledged. Researchers should not abuse their positions or knowledge for personal power or gain.

(ix) RISK MINIMISATION

Researchers should ensure that the actual benefits to be derived by the participants or society from the research clearly outweigh possible risks, and that participants are subjected to only those risks that are clearly necessary for the conduct of the research. Researchers should ensure that the risks are assessed and that adequate precautions are taken to minimise and mitigate risks.

(x) NON-EXPLOITATION

There may be no exploitation of research participants, researchers (including student and junior members), communities, institutions or vulnerable people. There should be benefit to a community in which research is conducted. As far as possible, communities should receive feed-back on research carried out on them.

2. RELATIONSHIP BETWEEN RESEARCHERS AND PARTICIPANTS

2.1 Participants should be seen as indispensable and worthy partners in research. Researchers should respect and protect the rights and interests of participants at every stage and level of research.

2.2 The risks and benefits of the research to the prospective participants should be fully weighed. Research that could lead to unnecessary physical, social and/or psychological harm should not be undertaken. Researchers should

identify potential risks to participants and make provision for their avoidance. When risks form part of the conduct of the study, efforts should be made for mitigation or protection.

2.3 In case harm, injury or loss of opportunity is incurred by participants, provision should be made for compensation or payment for treatment with clear guidelines on how to obtain this.[6] In the event of significant harm, participants should be entitled to claim compensation regardless of whether or not there was negligence or legal liability on any other basis.

2.4 The criteria for selecting research participants should be fair. Repeat studies should not be done on the same group because of their easy accessibility, as this will make them bear an unfair share of the burden of participation. At the same time, it should be borne in mind that no particular group(s) should be unfairly excluded from research, as this could result in their unfair exclusion from the direct, indirect or potential benefits of research.

2.5 Unless consent on a mutually beneficial arrangement is obtained, Unisa and its students should not use a community or research setting as a constant and long-term resource for data collection for curricular research or training.

2.6 The relevant social, cultural and historical background of participants should be taken into consideration in the planning and conduct of research.

2.7 Researchers should not infringe the autonomy of participants by resorting to coercion, undue influence or the promise of unrealistic benefits. Coercion may include taking undue advantage of individuals or abusing the authority and influence of research. Inducement may include a promise of material or financial rewards, services or opportunities. No financial or other inducement should be offered to participants, whether children or adults, parents or guardians of children taking part in research. Reimbursement of expenses (e.g. transport costs, meals) or compensation for time or effort expended or opportunity lost is allowed, on condition that all participants are offered similar rewards and that such rewards are aimed at recompensing only.

2.8 Researchers should ensure that reimbursements or compensation to participants does not cause conflict in the group or community.

2.9 Research should not unreasonably burden or exploit participants or communities, and should not unnecessarily consume their time or make them incur loss of resources, opportunities or income.

2.10 Participants are autonomous agents who have the right to choose whether or not to be part of the research.

2.11 Participants should be informed of the existence of the Unisa Policy on Research Ethics. The policy should be made available to them if it can help them make an informed decision regarding their participation.

3. INFORMED CONSENT

3.1 Personal information (i.e. information[7] about an identifiable, natural person)[8] may only be collected and processed with the specific informed consent of the individual(s) involved. Only information that is relevant and necessary (i.e. not excessive) may be collected.

3.2 Consent need not be obtained where personal information is involved which has been de-identified to the extent that it cannot be re-identified again, if it is about a natural person who has been dead for more than 20 years,[9] or if it is in the public domain or contained in a public record.

3.3 The participation of individuals should be based on their freely given, specific and informed consent. Researchers should respect their right to refuse to participate in research and to change their decision or withdraw their informed consent given earlier, at any stage of the research without giving any reason and without any penalty.

3.4 Participants should give their consent in writing. They, in turn, should be given written information containing adequate details of the research.

3.5 Consent for participation in research is freely given and informed if

(i) it is given without any direct/indirect coercion or inducement. See paragraph 2.7 above.

(ii) prospective participants have been informed on the details of the intended research

(iii) prospective participants have understood this information

(iv) the researcher has answered any question(s) about the research and their participation

(v) it is given before research commences

3.6 The information in (ii) and (iii) should include the following:

• Purpose of research

The aims, implications (including commercial ones) and possible outcomes of the intended research should be stated in understandable language.

• Risks and benefits

The possible, anticipated and potential benefits and the potential risks (direct/indirect, immediate/long term) of the research should be explained. These include discomfort and unpleasant emotional experiences. Where questionnaires or interviews are involved, participants should be informed of the nature of questions posed, for example that they are sensitive or emotionally disturbing, or that they cover personal issues such as health, sex life or criminal

behaviour. Where research may affect communities (e.g. when genetically modified organisms are studied) they should be informed and consulted on possible long-term effects for them.

• Methods of study and participants' actual role in research

Where questionnaires or interviews are involved, participants should be informed of the estimated time these will take.

• Identity of the researchers

The name, address and telephone number of researcher(s), the institution(s) and the chairperson of the relevant Ethics Review Committee who may be contacted, should be provided.

• Identity of others associated with the research

The name(s), address and telephone number of chief consultant(s), funder(s) or sponsor(s) if any, should be provided.

• Why selected

The reasons or method for selecting the particular locality, community, group and/or individual for participation in the study should be explained.

• Privacy, anonymity and confidentiality

Measures to ensure privacy, anonymity and confidentiality of participants, as well as any risk of breach of confidentiality and anonymity should be explained. If data and identity provided by participants in group discussions cannot be kept anonymous and confidential, this should also be disclosed. See paragraph 4.8 below.

• Future use of information

Participants should be informed of any possible future use of the information obtained, including publication of research findings, use as a database, archival research, recordings for educational purposes, and use as secondary data (i.e. anonymous or abstracted information which does not violate the privacy, anonymity and confidentiality of participants).

• Right not to participate and to withdraw

Participants should be informed that they have the right to decline their consent outright, or to withdraw their given consent at any time without any penalty or prejudice. They are free to refuse to answer certain questions which form part of an interview or questionnaire, and to object to the use of data gathering devices, such as camera, tape recorder, and so forth.

• Right to get help

Researchers should help participant(s) in cases of adverse consequence resulting from their participation in research. These include psychological trauma, distress, and loss of job, social hostility or retaliation against the participant(s). When, in the course of the research, researchers come to know of a need of participants that is

not connected to the research but which may improve their lives (e.g. medical treatment), they should endeavour to get the help needed.

• Additional information should be given to which a reasonable person in the prospective participant's position is likely to attach significance in his/her decision whether to participate.

3.7 If the data collection from the participant(s) is done in more than one sitting and there is a long time period between the sittings/contacts, informed consent should be sought each time.

3.8 Nondisclosure of all information

In some situations the methodology or practicalities of a research project may necessitate the concealment of information. This may be due to the possibility that behaviour changes may result or responses be affected when such details are revealed to participants. In such a case the researcher should, before conducting the study, determine

(a) whether the use of such a methodology is justified by the scientific, educational or applied benefits

(b) whether alternative procedures which do not require the concealment of information could be used instead

If the use of such methodology is deemed justified by the researcher, the following should be done:

(i) A detailed justification for not revealing all necessary information and obtaining informed consent should be provided in the research proposal and methodology and it should be subject to scientific and ethical reviews. Only after approval in both reviews, should such research be undertaken.

(ii) The participants' right to privacy, anonymity and confidentiality gains additional importance in such cases as they do not know the real purpose or objective for which they provide information.

(iii) Even if both scientific and ethical reviews would allow that some of the information about the study need not be revealed, participants should be provided the rest of the information. In no case,

however, should researchers withhold information regarding risks, discomfort, unpleasant emotional experiences, or any such aspect that would be material in making the decision to participate.

(iv) Participants should be given the reasons for not providing full information as soon as is possible after completion of the research. Where needed, services such as counselling and referral should be offered.

3.9 Consent where gatekeepers are involved

In some situations there may be a need to obtain permission of the "gatekeeper" to access the participants for research. The following care should be taken in such a situation:

(i) Permission obtained from the gatekeeper may not be substituted for the need to obtain separate and informed consent from the participants. The rights of participants in such a situation are the same as in all other cases.

(ii) In obtaining the gatekeeper's permission, no precondition made by the gatekeeper for access to information or data obtained should be accepted without the consent of the participants.

(iii) In the process of research or data collection, care should be taken to ensure that the relationship between the gatekeeper and the participants is not jeopardised.

3.10 Vulnerable participants

(i) Researchers should be concerned particularly about the rights and interests of vulnerable participants, such as children (i.e. those individuals under the age of 18 years), the elderly, pregnant women, people with mental impairment, prisoners, students and persons in dependent relationships, the disabled, indigenous people and indigents.[10]

(ii) Research results that can be obtained if carried out on adults should never be done with children. Children should participate only when

their participation is indispensable to the research. The protection and best interests of children are of prime importance.

(iii) Therapeutic research or experimentation[11] on a child under the age of 18 years may be conducted only if it is in the best interests of the child, and if the consent of both the child (if he or she is capable of understanding) and of his or her parent or guardian, has been obtained.

(iv) Nontherapeutic research or experimentation[12] may only be conducted on a child under the age of 18 years with the consent of the following persons: the Minister responsible for social development, the parent or guardian of the child, and the child if he or she is capable of understanding.[13] The Minister may not give consent if the research or experimentation poses a significant risk to the health of the child.[14]

4. PRIVACY, ANONYMITY AND CONFIDENTIALITY[15]

4.1 All research participants have the right to privacy to the extent permitted by law (e.g. child abuse cases should be reported to the appropriate authorities in terms of the law).

4.2 Privacy includes autonomy over personal information, anonymity and confidentiality, especially if the research deals with stigmatising, sensitive or potentially damaging issues or information. When deciding on what information should be regarded as private and confidential, the perspective of the participant(s) on the matter should be respected.

4.3 All personal information and records provided by participants should remain confidential. When conducting interviews it should be made clear that confidentiality and anonymity will be safeguarded. Whenever it is methodologically feasible, participants should be allowed to respond anonymously or under a pseudonym to protect their privacy.

4.4 All personal information obtained directly or indirectly on or about the participants (e.g. names obtained by researchers from hospital and school

records), as well as information obtained in the course of research which may reveal the identity of participants, should remain confidential and anonymous. This guarantee should also be given when researchers ask consent to use data which is not already available within the public domain (e.g. classified data on prisoners held by the Department of Correctional Services).

4.5 In the case of covert observation (e.g. of a public scene) steps should be taken to ensure that the information will not be used or published in a form in which the individuals could be identified.

4.6 Researchers should maintain privacy, anonymity, and confidentiality of information in collecting, creating, storing, accessing, transferring and disposing of personal records and data under their control, whether these are written, automated or recorded in any other medium, including computer equipment, graphs, drawings, photographs, films or other devices in which visual images are embodied.

4.7 Researchers should make appropriate arrangements for the preservation and confidentiality of research records for one year after the submission of the report or the results.

4.8 Risk minimisation should be applied to research records. The possibility of a breach of confidentiality and anonymity should be anticipated, addressed and explained to the participants as an attendant risk.

4.9 Codes or other identifiers should be used to break obvious connections between data and individuals/organisations/institutions where possible. Where there is a mixture of information obtained from the public domain and information obtained with the participants' informed consent, no traceable link should be left between the two sets of information.

4.10 Confidentiality and anonymity of participants and their localities should be maintained when reporting to clients/sponsors/funders. Participants should not be identified or made identifiable in the report unless there are clear reasons for doing so. If the researcher or institution intends to identify

participants or communities in the report, their informed consent allowing such disclosure should be obtained, preferably in writing.

4.11 Research findings published in the public domain (e.g. theses and articles) which relate to specific participants (e.g. organisations or communities) should protect their privacy. Identifiers which could be traced back to the participants in the study should be removed. However, public interest may outweigh the right to privacy, and may require that participants be named in reports (e.g. when child labour is used by a firm).

4.12 Participants' consent should be sought where data identifying them are to be shared with individuals or organisations not in the research team. They should be provided with information about such individuals or organisations (their names, addresses etc).

4.13 The obligation to maintain privacy, anonymity and confidentiality extends to the entire research team, other researchers at Unisa, Unisa administrative employees, and all those (from or outside Unisa) not directly associated with the research who may possibly have access to the information.

ANNEXURE "A": UNISA GUIDELINES FOR ETHICS REVIEW

1. INTRODUCTION

1.1 The research ethics review system in Unisa aims to protect potential human participants, animals, other living or genetically modified organisms, and contribute to the highest attainable quality of scientific and ethical research.

1.2 Unisa, having committed itself to safeguarding the rights of potential and actual human research participants, animals, other living or genetically modified organisms, undertakes to provide administrative, financial and other forms of support for the ethics review system.

1.3 The Executive Director: Research takes ultimate responsibility for the proper application of ethics review at Unisa. He/she ensures that the Guidelines for Ethics Review are publicly available at the Unisa Research Directorate and registers all research that has obtained ethics clearance.

1.4 The Unisa Policy on Research Ethics serves as the fundamental guide for ethics review. Other local and international guidelines may be used by Ethics Review Committees in Unisa.

1.5 Revision of the Guidelines for Ethics Review may be initiated by any Ethics Review Committee in Unisa. Revision must be done through the broadest and most transparent process possible, and any changes must be disseminated widely. The Executive Director: Research is the officer responsible for revision.

2. RESEARCH REQUIRING ETHICS REVIEW COMMITTEE (ERC) APPROVAL

Researchers may not undertake research involving humans, animals or other living or genetically modified organisms without the prior approval of the appropriate ERC, if the research

- is done on the premises of Unisa or in any of its Units or if it uses Unisa facilities,
- involves Unisa employees or students, in various capacities including collaborative or multi-institutional or multi-country studies, or
- is or will be funded from Unisa funds or if funding for it was acquired through Unisa.

3. NATURE OF ETHICS REVIEW COMMITTEES (ERCs)

3.1 ERCs are independent bodies comprising members who have the ability to undertake thorough, competent and timely reviews of research proposals. They must be independent from political, institutional, professional and market pressure.

3.2 The ERC is different from a scientific or technical review committee. While the ERC examines the adherence of the research to ethical principles, the scientific or technical review committee looks at its scientific and technical quality. Membership in committees may overlap but the ethics review must be independent of the scientific review

3.2.1 It is beneficial for the work of the ERCs to maintain active links with the scientific or technical committee, especially because some methodologies or research designs while technically sound, could involve ethical dilemmas. ERCs may seek the advice of experts or of the scientific or technical committee when in their view this will help them in the discharge of their functions.

4. TERMS OF REFERENCE OF ETHICS REVIEW COMMITTEES

4.1 The main role of ERCs is to promote the conduct of ethical research in Unisa. In particular, they contribute to safeguarding the dignity, rights, safety, and wellbeing of all actual or potential research participants and communities, as well as animals, while taking into account the interests and needs of researchers and the integrity of Unisa.

4.2 There are two categories of ERCs in Unisa, namely the University ERC and the Unit ERCs:

- The University ERC has Unisa-wide jurisdiction and is not attached to or based in a single unit in Unisa. It is a subcommittee of the Senate Research Committee.
- The Unit ERCs are attached to or based in a specific college/institute/centre. There is a minimum of one Unit ERC per college.

4.3 The Unisa Ethics Review Committee

4.3.1 provides guidance to Unit ERCs.

4.3.2 reviews research protocols and ongoing research that require its action, including complaints from researchers and matters not resolved at Unit level.

4.3.3 provides guidance to researchers on the ethical aspects of their work.

4.3.4 develops mechanisms in consultation with Unit ERCs for the promotion of cooperation between the Unisa ERC and Unit ERCs, and among Unit ERCs.

4.3.5 develops and proposes policies to enhance and facilitate ethical research and ethics review in Unisa, including those which are necessary for building capacity in ethical research and ethics review.

4.3.6 reviews the UNISA Policy on Research Ethics as the need arises.

4.3.7 provides advice to the Executive Director: Research on matters pertinent to research ethics.

4.3.8 reviews research which:

- is elevated to it for action or opinion from Unit ERCs, researchers, research participants or other stakeholders in research, or
- involves several colleges/institutes/centres. Such cases must first have the approval of the pertinent Unit ERCs before

review by the Unisa ERC. Where there is inconsistency in the response to the research proposal between the Unit ERC(s) and the Unisa ERC, steps must be taken by either or both ERCs to resolve the issues involved. If the issue cannot be resolved in this way, the Unisa ERC decision takes precedence. Basic ethical principles for research remain the basis for resolving issues.

4.4 Unit Ethics Review Committees

4.4.1 review research proposals and evaluate the ethical aspects of ongoing research within their jurisdiction. Colleges/institutes/centres should seek the approval of the relevant Unit ERC before research contemplated under paragraph 2 above is conducted.

4.4.2 furnish the Research Directorate with information on all research proposals that they review and investigate all information on unethical studies that are reported to them by researchers, participants or peer reviewers while ensuring the confidentiality of the report or information.

4.4.3 elevate to the Unisa ERC proposals and ethical issues in ongoing research that require appropriate action.

4.4.4 provide guidance to researchers and lecturers in the college/institute/centre with regard to specific ethical issues within the domain of the discipline involved.

4.4.5 propose policies to enhance and facilitate the ethical conduct of research including those that are necessary for capacity building in ethical research and ethics review.

4.4.6 develop specific guidelines for specific needs within a college/institute/ centre or for the composition of Unit ERCs for approval by the Unisa ERC.

4.4.7 provide guidance to other Unit ERCs and College Committees when consulted. In particular, the guidance of the Animal ERC of the College of Agriculture and Environmental Sciences should be sought for all research projects involving animals or other living organisms.

4.4.8 review projects proposed by lecturers who require students to do research as part of formative or summative assessment and/or teaching strategy. Sufficient information should be provided by lecturers and clearance obtained before the project may proceed.

Class approval for student research projects may be sought in certain circumstances. See paragraph 10.7 below.

4.4.9 ensure that employees and students adhere to the Unisa Policy on Research Ethics in any collaborative or individual research.

4.4.10 evaluate ongoing research that they have previously approved.

4.4.11 review research which:

- involves their personnel or students,
- is funded from college/institute/centre funds or the funding of which was acquired through the college/institute/centre, or
- will use college/ institute/centre facilities or will be done on the premises of the college/institute/centre.

4.5 There must be open communication and active cooperation between the Unisa ERC and the Unit ERCs to achieve the highest possible quality of ethical review in Unisa.

4.6 Multi-institutional research

Research involving external bodies (e.g. laboratories/institutions/universities) in South Africa or in other countries must have the approval of appropriate ERC(s) in Unisa. To facilitate the review process, parallel or simultaneous reviews may be conducted among the ethics committees of the institutions involved. In no case however may the approval by ethics committees of external institutions replace the review and action by the appropriate Unit/Unisa ERC.

5. COMPOSITION OF ETHICS REVIEW COMMITTEES

5.1 Chairpersons of the College Research Committees serve ex officio on the Unisa ERC and Unit ERCs.

5.2 Regular membership of an ERC is between 5 - 11 members. The regular members of ERCs should come from different academic disciplines and sectors. These are

- scientists or researchers
- person(s) with competence in law
- person(s) with competence in research ethics

- lay person(s) including representatives of interest groups such as groups for consumer rights, animal welfare, indigenous peoples' rights and environmentalists.

5.3 Membership on *ad hoc* basis

5.3.1 In addition to the regular members, members may be appointed on an ad hoc basis by the Executive Director: Research to provide the ERC with special expertise or guidance not adequately available in its regular membership, e.g. representatives of special groups or communities and other Unit ERCs. The duration of their membership in the committee must be based on the need of the ERC for their special expertise.

5.3.2 The ERC must exert efforts to include a representative of the population which will be studied. If this is not possible, the ERC must invite persons who are knowledgeable about the culture, history, social dynamics and vulnerabilities of this population and who can speak on their behalf.

5.3.3 If, in the view of the ERC, human populations will be affected by particular agricultural science research, the committee must exert efforts to include a representative of the populations that will be potentially affected. If this is not possible, the ERC must invite persons who are knowledgeable of the culture, history, social dynamics and vulnerabilities of this population and who can speak on their behalf.

5.3.4 Where appropriate, e.g. where animals or plants are involved, ERC membership must include persons who are knowledgeable in appropriate fields, including animal welfare, environmental or ecological principles, and nature conservation laws.

5.4 When a case is elevated to the Unisa ERC, the chairperson of the relevant Unit ERC is invited to sit in the meetings of the Unisa ERC.

5.5 All ERCs at Unisa should strive for balanced representation in terms of gender, race, and discipline.

6. OFFICE BEARERS OF ETHICS COMMITTEES

6.1 Chairperson

The chairperson of the ERC is elected by the members from among themselves and has a term of three years.

6.2 Secretary

The ERC is provided secretarial and administrative assistance, as well as a secure office, by the Unit or Unisa.

7. FUNCTIONS OF OFFICE BEARERS

7.1 Chairperson

7.1.1 The chairperson is the presiding officer and overall administrator of the work of the ERC.

7.1.2 The chairperson is responsible for:

- ensuring that the records and documents of the committee are secure and, in appropriate cases, kept confidential;
- documenting adequately and in a timely manner all documentation of committee meetings and deliberations;
- the recording of receipts of applications, documents submitted and other transactions of the ERC; and
- reporting annually to the members and the Unisa ERC (in the case of Unit ERC) and to the Unisa Executive Director: Research (in the case of the Unisa ERC) on funds received and disbursed.

7.2 Secretary

The secretariat is responsible for:

7.2.1 preparing communications regarding the listing of each received and approved document, the frequency of continuing review, and other obligations of the investigator or researcher;

7.2.2 stamping approval and expiry date on every page of the consent form;

7.2.3 obtaining signature of chairperson;

7.2.4 keeping records and receipts;

7.2.5 organising and maintaining a registry of research proposals reviewed by the ERC;

7.2.6 submitting all research that obtained ethics clearance to the Research Directorate for registration;

7.2.7 signing a confidentiality agreement;

7.2.8 executing other tasks assigned by the chairperson.

8. MEMBERSHIP OF ETHICS REVIEW COMMITTEES

8.1 Appointment

8.1.1 Members of the ERC, including those who do not have appointments as employees of Unisa, are appointed by the Executive Director: Research and have a term of office of three years with possible reappointment.

8.1.2 To ensure continuity in the workings of the ERC, as well as utilise accumulated experience and wisdom, the term of office of regular members of the ERC is rotated. The first ERC membership tenure rotation is broken down as follows:

- No more than 50% of the members serve for two years, the remainder for three years.
- The succeeding members serve the full three-year term.

8.2 Conditions of appointment

8.2.1 ERC members should be willing to have their names and affiliations made publicly available.

8.2.2 ERC members should sign a confidentiality agreement regarding meetings, deliberations, applications and related matters.

8.2.3 Only members who are not appointed as employees of Unisa may receive honoraria for work on the ERC, and all reimbursements and payments received in relation to their work in the ERC must be recorded.

8.3 Resignation

8.3.1 A member who can no longer serve on the committee must resign in writing. No reason for the resignation need be stated.

8.3.2 A vacancy should be filled as soon as possible. The chairperson of an ERC recommends people to fill vacancies to the Executive Director: Research.

9. MEETINGS

9.1 The ERC meets every three months or more frequently if the need arises.

9.2 It may decide to meet regularly en banc or as subcommittees. However, in instances where there is disagreement among members regarding action on applications, or whenever the need arises, the chairperson may call for an en banc meeting.

9.3 A simple majority of regular and ad hoc members constitutes a quorum.

9.4 Members must be furnished well ahead of time with all documents which will be deliberated on at the meeting.

9.5 The ERC may decide to divide the members into subcommittees to review research proposals. This is particularly pertinent to ERCs that have a considerable volume of proposals and/or a diversity of research fields to review. Alternatively, it may decide to review the research proposals en banc.

9.6 Voting

9.6.1 When a vote is required to arrive at a decision, a simple majority of members present suffices. However, any dissenting opinion must be adequately recorded and kept.

9.6.2 All regular and ad hoc members are entitled to vote. Each member has one vote.

9.6.3 The chairperson votes only when there is a tie.

9.6.4 No member who has not reviewed the application can vote on that application.

9.7 Timely decisions

9.7.1 To ensure complete and correctly accomplished applications the ERC must communicate to applicant(s) its action or decision within two weeks after the meeting where the application was decided on.

9.7.2 Applications with incomplete or incorrect documents must be returned no later than two weeks after receipt of the application. Inadequacies in the application must be clearly identified in the communication to researchers.

9.8 Possible decisions

The ERC can make any of the following decisions on applications:

- Approved
- Require modifications
- Request further information or clarification
- Disapproved, with reasons

9.9 Conflict of interest on ethics review committee

9.9.1 Only members without conflict of interest with the research under review may participate in the deliberations and vote.

9.9.2 There is conflict of interest when a reviewer has an interest relative to a specific application for review and such interest can compromise his/her ability to make a free

and independent evaluation. Conflicts of interest may arise, for instance, when the reviewer has financial ties to the project.

10. PROCEDURE FOR ETHICS REVIEW

10.1 Submissions required for ethics review

Two copies each in English of the following must be submitted to the ERC:

(i) Complete research proposal. The proposal which is submitted for scientific or technical review must be the same as that submitted for ethics review.

(ii) Completed application for review form.

(iii) Proposal summary sheet.

(iv) Documents related to the proposal.

10.2 The application for review form must contain the following information:

(i) Researchers' names, affiliations, addresses and contact numbers

(ii) Organisation(s) or institution(s) involved in the study

(iii) Sponsors or funders

(iv) Other pertinent information such a conflict of interests. There is conflict of interest when the researcher has an interest in the research that may jeopardise his/her ability to undertake the research in a scientific and ethical manner.

10.3 The proposal summary sheet must contain the following information:

(i) Title of the proposal

(ii) List and definitions of acronyms and abbreviations

(iii) Name(s) of principal investigator(s)/researcher(s). If this is a student, a letter of confirmation from Unisa must be included.

(iv) Names and addresses of all sponsor(s) or funder(s)

(iv) Abstract of the proposal in nontechnical language

(v) Research objectives

(vi) Anticipated outcomes

(vii) Inclusion or exclusion criteria (if applicable)

(ix) Withdrawal or discontinuation criteria (if applicable)

(x) Methodology or research design

(xi) Activity plan or time line

(xii) Safety procedures and criteria (if applicable)

(xiii) Description of procedure of reporting to ERC

(xiv) Description of how participants will be informed of the findings or results and consulted on potential or actual benefits of such findings or results to them and others

(xv) Description of the risks of the procedures which participants may/will suffer (e.g. no risk, discomfort, pain, stigmatisation, negative labelling/other potential risks) as well as the level of risk. See paragraph 10.10 below.

10.4 The proposal-related documents must include the following:

(i) Participant information sheet (if applicable)

(ii) Description of the process for obtaining informed consent

(iii) Informed consent form in English and in the language of the potential participants. The language should be understandable to a lay person.

(iv) Description and/or amounts of compensation including reimbursements, gifts or services to be provided to participants (if applicable)

(v) Description for arrangement for indemnity (if applicable)

(vi) Description of any financial costs to participants (if applicable)

(vii) Description of provision of insurance coverage to participants (if applicable)

(viii) Description of steps to be undertaken in case of adverse event or when injury or harm is experienced by the participants attributable to their participation in the study.

(ix) Statement agreeing to comply with ethical principles set out in the Unisa Policy on Research Ethics

(x) Disclosure of any previous ethics review action by other ethics review bodies (if applicable)

(xi) Research instruments such as questionnaires, interview guides and similar documents

(xii) Research budget

(xiii) Project agreement (e.g. MOA)

(xiv) CVs of principal investigators

(xv) Letter(s) of permission from relevant bodies (if applicable)

10.5 Steps for reviewing proposals

10.5.1 After members have reviewed the proposal and related documents they make a summary of the proposal and documents using the Assessment Form/Checklist.

10.5.2 They then write their decision on the appropriate page of the Assessment Form/Checklist. If the decision is ”disapproved” they must write the reasons for the disapproval. If the decision is ”modify” the items for revision must be clearly indicated in the Assessment Form/Checklist.

10.5.3 Reviewers should as far as possible provide researchers with suggestions for meeting the ethical requirements for the research, especially if the research is deemed to be significantly beneficial to society or has strong social justice merits. However, the justice merit of the research cannot on its own be used to approve an ethically defective proposal.

10.5.4 The members' views are discussed at the meeting and a decision reached in accordance with paragraph 9 above.

10.5.5 Any member can request the chair to invite the investigators and/or funders to elaborate or explain certain aspects of the proposal.

10.5.6 The chairperson must communicate the decision of the ERC to the applicant in writing. This must include a clear explanation if the decision is negative or if revisions are required.

10.5.7 Research which involves external institutions as well as the participation of employees or students from Unisa must be reviewed and acted on by the Unit ERC(s) to which the employees or students belong.

10.6 Expedited review

10.6.1 Expedited review is possible for proposals that pose no significant risks or need only minor revisions after previous conditional approval.

10.6.2 The chairperson may nominate two or more members to review the proposal. If it is a resubmission, previous reviewers should be nominated. The reviewers examine the proposal and documents.

10.6.3 The chairperson circulates the reviewers' decision and comments to the rest of the members for their decision. If a consensus cannot be reached or a

member expresses some concerns, the proposal must be given a full review. An en banc meeting of the ERC may be required.

10.6.4 The chairperson then communicates the decision to the researchers.

10.7 Class approval

10.7.1 Projects that vary in detail but conform to the same general pattern may be given class approval by the Unit ERC to avoid repetitive submissions. This is appropriate for training and research projects to be carried out by students, especially where these pose no risk of distress or injury to participants.

10.7.2 If research is to be undertaken according to class approval previously obtained, a letter stating this should be sent to the Unit ERC for its records.

10.8 Ongoing review

10.8.1 The ERC evaluates ongoing research that it has previously approved.

10.8.2 Principal investigators must submit in writing the following to the ERC:

(i) Report of any adverse event[1] including a detailed description of the event, measures taken to address it and the outcomes. This report must be submitted as soon as possible, but not later than two weeks after occurrence of the event.

(ii) Report of any ethical problems encountered including a description of how these were addressed. This report must be submitted every two months after commencement of the research.

(iii) Any changes in the research design including methodology.

(iv) A terminal report describing the actual procedures for taking informed consent and any other ethics-related procedures, including the steps taken to ensure that participants are informed of the findings and consulted on how the findings can benefit them or others.

(v) For long-term research and highly sensitive research the ERC can require a progress report on a regular basis for renewal of approval.

Relevant to (iii), any envisaged change in the study design or methodology that has potential or actual ethical repercussions must first be approved by the ERC.

[1] That is, harm or injury suffered by participants that is attributable to the research such as physical harm, psychological or emotional stress, financial loss and social ostracism or stigma.

10.8.3 It is the duty of researchers to inform the ERC in writing as soon as possible in the case of premature termination of the study. The information should include an explanation for the premature termination, including an explanation of measures taken to protect the participants against any adverse effects of the premature termination.

10.9 Review fees

10.9.1 A standard review fee, the amount to be set by the Unisa ERC, may be charged for exclusively external research or research which is externally funded. The fee is payable upon submission of the proposal for review.

10.9.2 Monies thus collected may be spent on the operation of the ERC.

10.10 Vulnerability and risks

10.10.1 It is the duty of reviewers to identify whether or not the research will involve vulnerable persons or groups and to ensure that adequate protective measures are provided for.

10.10.2 Special attention should be given to evaluating the risks of participants in relation to benefits.

10.10.3 Research can be classified on the basis of the degree of risk:

'Category 1' Research involving negligible or minimal risk

'Category 2' Research involving greater than minimal risk but presenting the prospect of direct benefit to participants

'Category 3' Research involving a minor increase in minimum risk and presenting no prospect of direct benefit to participants

'Category 4' Research that does not fit the above categories

10.10.4 While all research involving human subjects should be approved by an ERC and subjected to scrutiny, research involving reviews of administrative records which contain names of people may require a lower level of scrutiny, while research involving solely aggregated data and literature reviews needs the lowest scrutiny (if any).

11. ASSESSMENT FORM/CHECKLIST

11.1 Code number

11.2 Title of research proposal

11.3 Proponent(s)

11.4 College or Institute

11.5 Sponsor or funder

No N/A Yes

(i) Demonstrated that potential benefit outweighs potential harm

(ii) Justification for risk

(iii) Protective measures for vulnerable participants

(iv) Informed consent form in language familiar to participant

(v) Information in consent form clear and comprehensible to participant

(vi) Consent form contains the following basic information:

- purposes of research
- expected duration of participation
- participant's actual role in the study
- procedures for selection of participants
- foreseeable risks and discomforts
- procedures or measures in case of adverse event
- how privacy of participants will be ensured
- benefits to the participant
- benefits to others
- how confidentiality will be maintained
- compensation/gifts/services to participants
- reimbursements
- indemnity
- insurance
- approximate number of participants
- additional information required by local laws
- names of contact person for research-related inquiry

- statement that participation is voluntary and no penalty or loss of benefit for nonparticipation
- measures that will be taken if injury or harm attributable to study occurs
- statement that participant can withdraw any time without obligation to explain

(ix) Procedure for taking prior informed consent ensures that potential participants understand the implications of their participation and are able to make an autonomous decision.

(x) Security of data storage

(ix) Information and consultation with participants on findings or results

(xi) Participants' access to products developed by study

(xii) Sharing of benefits from products developed by study

(xiii) Reporting to ERC after approval

(xiv) Qualifications of investigators and staff

(xv) Disclosure of conflict of interest

(xvi) Benefit to local community

(xvii) Benefit to larger society

(xviii) Community participation

(xix) Possible adverse impact on the community

(xx) Manner of sharing or disseminating findings or results

(xxi) Prior informed consent

Acknowledgement and works consulted

1. The ethics review system for research in Unisa has been adapted from international guidelines. These include:

- the Declaration of Helsinki,
- the Council for International Organizations of Medical Sciences (CIOMS)
- International Ethical Guidelines for Biomedical Research Involving Human Subjects,
- World Health Organisation *Operational Guidelines for Ethics Committees that Review Biomedical Research* (2000) Geneva

- Belmont Report *Ethical Principles and Guidelines for the Protection of Human Subjects of Research*
- Nuffield Council on Bioethics *The Ethics of Research related to Healthcare in Developing Countries* (2002)
- The Philippine Council for Health Research, National Ethics Committee *National Guidelines for Biomedical/Behavioural Research* (2000)

2. It is further based on principles contained in applicable UN declarations such as:
   - the Universal Declaration of Human Rights,
   - the Convention for Biological Diversity,
   - the Declaration on the Elimination of Discrimination against Women,
   - the Declaration of the Rights of the Child, and
   - the Rights and Protection of Indigenous Peoples.
3. It is also based on the Standard Operating Procedures developed by the Forum for Ethics Review Committees – WHO (FERCAP-WHO) for ethics review and with consideration of relevant national legislation and ethical guidelines. See also Alvarez Castillo F *Ethics for Social Research in Health: the PHSSA Guidelines* Philippine Health Social Science Association Manila (2001);
4. Items 7, 9, 10 and 11 were adapted from

4.1 The WHO 2000 *Operational Guidelines for Ethics Committees that Review Biomedical Research*

4.2 University of the Philippines Manila, College of Medicine Research Implementation and Development Office *Research Manual* (2003); and

4.3 Torres C IEC/IRB Review Requirements and Procedures. UP-NIH Fogarty International Center Training Program in Bioethics. Quezon City: Philippines (2005)

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Prof MA Seedat – Institute for Social and Health Sciences

Dr Rendani Ladzani – Research Directorate

Prof SM Mogotlane – Health Studies

Prof MA Seedat – Institute for Social and Health Sciences

Approved – Council – 21.09.07

APPENDIX D: Code of Ethics of the American Library Association

As members of the American Library Association, we recognize the importance of codifying and making known to the profession and to the general public the ethical principles that guide the work of librarians, other professionals providing information services, library trustees and library staffs.

Ethical dilemmas occur when values are in conflict. The American Library Association Code of Ethics states the values to which we are committed, and embodies the ethical responsibilities of the profession in this changing information environment.

We significantly influence or control the selection, organization, preservation, and dissemination of information. In a political system grounded in an informed citizenry, we are members of a profession explicitly committed to intellectual freedom and the freedom of access to information. We have a special obligation to ensure the free flow of information and ideas to present and future generations.

The principles of this Code are expressed in broad statements to guide ethical decision making. These statements provide a framework; they cannot and do not dictate conduct to cover particular situations.

I. We provide the highest level of service to all library users through appropriate and usefully organized resources; equitable service policies; equitable access; and accurate, unbiased, and courteous responses to all requests.

II. We uphold the principles of intellectual freedom and resist all efforts to censor library resources.

III. We protect each library user's right to privacy and confidentiality with respect to information sought or received and resources consulted, borrowed, acquired or transmitted.

IV. We respect intellectual property rights and advocate balance between the interests of information users and rights holders.

V. We treat co-workers and other colleagues with respect, fairness, and good faith, and advocate conditions of employment that safeguard the rights and welfare of all employees of our institutions.

VI. We do not advance private interests at the expense of library users, colleagues, or our employing institutions.

VII. We distinguish between our personal convictions and professional duties and do not allow our personal beliefs to interfere with fair representation of the aims of our institutions or the provision of access to their information resources.

VIII. We strive for excellence in the profession by maintaining and enhancing our own knowledge and skills, by encouraging the professional development of co-workers, and by fostering the aspirations of potential members of the profession.

Adopted June 28, 1997, by the ALA Council; amended January 22, 2008.

APPENDIX E: Open-ended Questionnaire

1. Understanding the meaning of knowledge management

1. What do you understand by the term Knowledge Management?

2. What are the categories of knowledge available at MCNY (categories such as information that you have that you use, or have used, to change the way you fulfil your job responsibilities)?

3. What knowledge do you need to carry out your work?

4. Do you know the number of files in the system that are relevant to your work?

5. What knowledge retention policies are in existence at MCNY?

6. What knowledge retention practices are you aware of as being in existence at MCNY?

7. What knowledge gaps do you notice, that matter towards the fulfilment of your duties?

8. Is there new knowledge created in the process of doing your job duties?

9. Do you use new knowledge collected from external sources?

10. Are you aware of instances of deliberate knowledge creation?

11. Does you department exercise periodic knowledge contribution in the shared drive

12. What modern technologies are in use at MCNY that enhance the environment for KM practice?

13. What are the tools, methods and techniques used for knowledge retention

14. What are the tools, methods and techniques used for knowledge assessment in your department?

15. What are the tools, methods and techniques used for knowledge acquisition in your department?

16. What are the tools, methods and techniques used for knowledge transfer in your department?

17. What recommendations on implementing KM practices that enhance the value of library service at MCNY can you suggest?

2. Human capital analysis

1. Are you aware of expert categories of staff at MCNY?

2. Do you see staff placement as related to their expertise?

3. Does your department have expert database - existing vs. future development

4. Is there a concept of succession planning at MCNY and specifically relating to the library

5. How is knowledge of experts who are leaving MCNY captured, and do any procedures or plans to do so exist?

6. Are there any plans for the development of external industry experts or databases?

7. Does MCNY have plans for expert knowledge sharing on regular basis?

8. Does MCNY have plans in place for the development of best practices, using experts?

APPENDIX F: Questionnaire

Dear Participant,

I am gathering data for a research project in fulfilment of my Ph.D. program at the University of South Africa (UNISA), School of Arts, Education, Languages and Communications, Department of Information Science, P. O. Box 392, UNISA 0003, UNISA - Campus, Preller Street, Muckleneuk Ridge, Pretoria, South Africa. Likewise, I have attached a narrative discussion of my dissertation, which provides some information about the study I would like to conduct at MCNY and the potential benefits the results might contribute to the improvement of the library.

Please submit the provided survey before 11/30/2009. The survey is not intrusive and takes on average about 20 minutes to complete.

At this point, I have successfully submitted and defended my research proposal at UNISA. The following is a brief overview of the study:

Title of the research study:
The Knowledge Management Role of an Academic Librarian in a Changing Information Environment with Special Reference to the Metropolitan College of New York.

Purpose of the Study:
This study was organized as a case study to explore/ investigate knowledge management principles as a possible operational basis for providing a consistently efficient and effective quality service by the library in an information environment that is fast changing.

Procedures to be used:

A sample of participants will complete a short survey. Concurrently, some participants will meet with the researcher for a short interview in their offices at times that are convenient to them between 11/01/2009 and 11/30/2009.

Potential risks to participants:
There is no apparent risk to the participants involved in this study.

Potential benefits of the study:
By identifying what the library needs to do to enhance the quality of its service, recommendations for strategies to increase the student support are put in place.

Protection of the identity and privacy of the participants:
Participants are requested to answer only the questions on the instrument and responses are encrypted so that they are not readable to anyone else but the researcher. Respect for privacy and identity of participants is in accordance with the specifications of the UNISA Policy on Research Ethics (2007) and the American Library Association (ALA) Code of Ethics of 1997 (amended January 22, 2008). Participants may also withdraw from the study at any time if they feel they do not wish to complete it.

Other than the survey questions, only general demographic information will be asked. Once returned to the investigator, the research results and findings will be analysed.

Thank you in advance for your support. I can be reached by e-mail at 44642393@mylife.unisa.ac.za or jmavodza@mcny.edu.

1. Do you consent to participate in this survey?

☐ Yes ☐ No

2. What staff category do you belong to? (Please select as appropriate)

Staff category	
Faculty full-time	
Faculty part-time	
Administrative staff	
Non-administrative staff - full time	
Non-administrative staff - part time	

3. If you are non - faculty, do you work for the library?

Yes	
No	

4. For how many years have you held that position at MCNY?

Less than 1 year	Up to 3 years	Up to 5 years	More than 5 years

5. The relationship between knowledge and information is that

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
They mean the same thing					
Knowledge depends on information					
Knowledge management is the same as information management					
Knowledge management includes information management					

Information use can lead to knowledge creation					

6. What is your perception on the environment for sharing of knowledge in your department?

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
It facilitates knowledge creation					
It facilitates knowledge storage					
It facilitates knowledge retrieval					
It facilitates knowledge transfer					
It enables me to accomplish tasks quickly					
It improves my job performance					
It is useful in my job overall					
It enables me to react more quickly to change					
It speeds decision making					

7. What is your perception on the environment for sharing of knowledge at MCNY?

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
The specific knowledge that I need is found only among experts at MCNY rather than in a central location					
The concept of knowledge is difficult to clearly articulate					
The knowledge stored in a central location cannot be directly applied					

without extensive modifications because of the fast-paced dynamic environment that my department operates in					
As the tasks of my department change frequently, I am always having to seek new knowledge that is not directly available in the MCNY databases or on the shared computer drive					
I am able to extensively re-use knowledge from the shared drive after making a few changes to adapt the retrieved knowledge to the current situation					
The knowledge that I find in the shared drive can be applied to current situations with little or no need to seek out or create new knowledge					

8. Do you think the members of your department are

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Satisfied by collaborating to accomplish tasks?					
Supportive for knowledge sharing and creation?					
Willing to collaborate across organizational units?					
Accept responsibility for failure?					

9. I always find

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
The precise knowledge I need					
Sufficient knowledge to enable me to do my tasks					
That I am satisfied with the knowledge that is available in my department to use					

10. There should be a reward system for

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Creating reusable knowledge resources					
Reusing existing knowledge resources					
Contributing to a library or collection of reusable knowledge resources					

11. When a colleague asks you to help with their knowledge needs, what type of knowledge is typically sought?

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Essential for business performance					
Essential for the College's competitive advantages					

Important for leading to innovation and/ or creative work					
Outdated and no longer useful for business					

12. Most of the skills and expertise that you have been using in your job for the past 6 months were acquires

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
At MCNY					
Through self-learning					
Through formal training					
At my last job					

13. Most of the knowledge that I need to do my work is located

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
In paper-based documents					
In the heads of my department members					
In a central information system					
On my personal computer or workstation					
On all computers in the department					

14. Knowledge that you acquire in your present job belongs first and foremost to

	Strongly	Agree	Neutral	Disagree	Strongly

	agree				disagree
You alone					
MCNY alone					
Depends on how much effort you put into it					
Both yourself and MCNY					

15. To do my work when I am stuck

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I often consult with my divisional supervisor					
I often make use of documented procedures with MCNY					
I often consult with other departments within MCNY					
I often consult with colleagues from other colleges					

16. My biggest barrier to being able to store information that I receive more efficiently and effectively is

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Lack of time/ too busy					
Inefficient technology					
Poor information systems					
Organizational policy/ directives					

17. Sharing of information

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
happens constantly with other departments in the College in formal ways to do my job well					
happens constantly with other colleagues in the College in formal ways to do my job well					
happens rarely with other departments in the College in formal ways to do my job well					
never happens with other departments in the College in formal ways to do my job well					
never happens with other colleagues in the College in formal ways to do my job well					

18. What are the challenges you face in sharing information with people from other departments within the College?

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Colleagues do not seem to perceive that there is an urgent need to share					
I do not see an urgent need to share information					
There is a lack of open-minded					

sharing environment					
There is a lack of trust of other people's knowledge					
There are no proper organizational guidelines on sharing					
The bureaucratic procedures involved in sharing are complicated					
My tasks do no require cross-department information sharing					
There is no proper IT platform to share information on					
I do not know about other people's knowledge needs					

19. In my department, the following are typical

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Staff development					
Plans for developing staff expertise					
There is regular performance appraisal					
Attending courses, conferences or workshops is encouraged					
Time used for attending courses, conferences, workshops is taken off individual vacation days					
There are mentoring incentives					
Succession planning is in place					

Training always takes place when there are new tools in use, or when the existing tools are changing					

20. My strength lies in

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Flexibility while performing my tasks					
Team skills					
People skills					
Communication skills					
The ability to assess and evaluate information					
Creating, recording and storing information					
Using information retrieval tools such as library databases					

21. Your duties involve using the following skills:

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Lateral thinking, that is, adapting your thinking to suit changing concepts and perceptions about library service					
Thinking in terms of MCNY rather					

than only the department you work in					
The power to persuade and sell your skills in the context of MCNY					
Managing change rather than merely enduring it					
Advocacy					
Strategic planning					
Project management capacity					

22. The following material needs to be kept in a repository of the College:

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
CA (Constructive Action projects)					
Only the CA projects with good grades					
Annual reports					
Institutional conference proceedings					
Multimedia material					
Student course material					
Library resources					
Other (please specify)					

23. The MCNY library

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
provides user orientation to new faculty					
provides user orientation to new					

staff members					
needs to be mandated by the College to provide user orientation to new faculty					
needs to be mandated by the College to provide user orientation to new staff members					
needs to be mandated by the College to periodically provide information retrieval and use workshops to all staff members					

24. An information literacy class for students should be a credited course and

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
can be useful if given as mandatory for every student during the first semester upon entry into College					
can depend upon faculty to determine student information needs					
can be provided on a continuous basis					
can be used by the college to determine information literacy gaps among students					
can be effective if faculty and librarians collaborate in providing it					

Thank you for completing this survey. Your time is valuable, therefore your contribution to this study of our library's service is highly appreciated

APPENDIX G: Library Interview Protocol

Time of interview: Date:

Place:

Interviewee's position: Interviewee's years of working experience:

Description of project:

Investigating knowledge management practices in the MCNY library

Questions:

1. When a colleague asks you to help with their knowledge needs, what type of knowledge is typically sought?

2. How did you acquire most of the skills and expertise that you have been using in your job over the past 6 months?

3. Where is most of the knowledge that you need to do your work located or stored?

4. Who owns the knowledge that you acquire in your present job?

5. How often do you make use of documented procedures to do your work when you are stuck?

6. What is the biggest barrier to your being able to store information that you receive more efficiently and effectively?

7. How often do you share information with other departments in the College in formal ways?

8. What are the challenges in sharing information with people from other MCNY departments?

Adapted from: Creswell (2007: 136)

APPENDIX H: Library Observation Protocol

Descriptive notes: activity/ situation observed	Reflective notes based on rating scale	Value (1-5) (1 being least prevalent and 5 being most prevalent)
the staffing situation of the library		
whether there is encouragement of library staff to initiate ideas		
whether knowledge sharing is encouraged/ rewarded		
if there is observable management support in terms of resources to the library		
whether there is open and rigorous dialogue among library staff and with faculty		
if library staff are amenable to helping each other to learn new ways of giving library service		
whether it is acceptable to speak one's mind respectfully and openly		
using what has been done before towards more effective library service, rather than using a lot of time creating what may be perceived as new things		

networking with other libraries, or belonging to library consortia		
recognizing and making use of available expertise at MCNY		
the kinds of materials kept in the library		
Whether there have been knowledge initiatives in the library, such as collaborating with other departments		