# ASSESSING KNOWLEDGE MANAGEMENT SYSTEMS IMPLEMENTATION IN GHANAIAN UNIVERSITIES

**BY**

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## DECLARATION

I declare that, **Assessing Knowledge Management Systems Implementation in Ghanaian Universities** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

…….. …….

**SIGNATURE** **DATE**

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This thesis has been submitted with my approval as supervisor:

…… …….....

**SIGNATURE** DATE

(Prof. Thomas Bingle van der Walt)

## DEDICATION

This thesis is dedicated to my wife (Harriet Afeafa Ankora-Dei) who has been my source of motivation and inspiration, my children (Shabach Eyram Dei, Zoe Elikem Dei and Kairos Emefa Dei), and Mrs Linda Oduro-Ampofo. May you always work hard towards the realisation of your dreams.

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## SUMMARY

Knowledge management (KM) is regarded as a strategic asset and a source of competitive advantage for organisations. While the issues of KM have been widely discussed by many researchers, there is a paucity of studies pertaining to the role of KM in enhancing the performance of universities, especially Ghanaian universities. Similarly, there is the lack of formal strategy that would provide an appropriate framework for these systems to ensure maximum utilisation of available knowledge for competitive advantage. Due to this, Ghanaian universities have been continually reinventing the wheel each time they lose knowledge through expertise leaving the universities. This loss of knowledge through expert staff exiting raises the need to have systems and strategies in place that will help the universities to capture that relevant knowledge. The research thus set out to address these problems by assessing the implementation of KM systems in Ghanaian universities and the strategies that could be adopted to manage and safeguard knowledge as a competitive advantage and for future use.

A survey and a mixed method research approach, which encompasses a questionnaire and interview schedules, were used to collect data from the stratified sampled respondents. One hundred and eighteen (80.27%) questionnaires were successfully received from the respondents, while all nine interviewees successfully responded to the interviews. Pattern matching, content analysis and explanation-building were used to analyse the qualitative data. The Microsoft spreadsheet and SPSS software were used to analyse the quantitative data and descriptive statistics in the form of tables, pie charts and histograms were used to present the findings.

The findings of this study showed that: the concepts of KM was universally understood by the respondents; KM processes were effective; systems and facilities such as internet, intranet, e-mails, mobile technology and DVD/VCD/CD were used to facilitate KM at the universities; leadership, culture, technologies and strategies were the KM enablers; e-learning, coaching and mentorship, communities of practice, and storytelling were the main strategies used to manage and safeguard knowledge; and KM systems had a positive impact on the universities. The study finally formulated an integrated KM framework to guide the implementation of KM systems in universities.

**Key words:** Knowledge management, KM processes, KM strategies, KM critical success factors, KM implementation, KM framework, KM enablers, e-learning, communities of practice

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## LIST OF ABBREVIATIONS AND ACRONYMS

| | | |
|---|---|---|
| AAU | - | Association of African Universities |
| ACCA | - | Association of Chartered Certified Accountant |
| ACU | - | Association of Commonwealth Universities |
| CAI | - | Computer-Assisted Instruction or Computer-Aided Instruction |
| CBI | - | Computer-Based Instruction |
| CBT | - | Computer-Based Training |
| CD-ROM | - | Compact Disk Read Only Memory |
| CIEE | - | Council for International Educational Exchange |
| CIM | - | Chartered Institute of Marketing |
| CIMA | - | Chartered Institute of Management Accountants |
| CKM | - | Chief Knowledge Manager |
| CKO | - | Chief Knowledge Officer |
| CoP | - | Communities of Practice |
| CRD | - | Cumulative Results-Driven |
| CSF | - | Critical Success Factors |
| CUSAC | - | Commonwealth Universities Student Exchange Consortium |
| DEC | - | Digital Educational Collaboration |
| DIK | - | Data Knowledge Information |
| DL | - | Distributed Learning |
| DVD | - | Digital Video Disk |
| E-learning | - | Electronic Learning |
| GAFCSC | - | Ghana Armed Forces Command and Staff College |
| GPCSC | - | Ghana Police Command and Staff College |
| GTUC | - | Ghana Technology University College |
| HEI | - | Higher Education Institution |
| IAU | - | International Association of Universities |
| IAUP | - | International Association of University Presidents |
| IBT | - | Internet-Based Training |
| ICT | - | Information and Communication Technology |
| IHE | - | Institutions of Higher Education |

| | | |
|---|---|---|
| ISEP | - | International Student Exchange Programs |
| IT | - | Information Technology |
| KM | - | Knowledge Management |
| LIC | - | Library and Information Centre |
| LIS | - | Library and Information Science |
| MIUC | - | Marist International University College |
| ML | - | Mobile Learning |
| ML | - | Multimedia Learning |
| MoE | - | Ministry of Education |
| NAB | - | National Accreditation Board |
| NABPTEX | - | National Board for Professional & Technical Examination |
| NCTE | - | National Council for Tertiary Education |
| NUFU | - | Norwegian Universities Committee for Development Research and Education |
| OE | - | Online Education |
| OKMM | - | Organisation Knowledge Management Model |
| RDI | - | Result Driven Incremental |
| ROI | - | Return-On-Investment |
| SECI | - | Socialisation, Externalisation, Combination and Internalisation |
| SPSS | - | Statistical Package for the Social Scientist |
| TEL | - | Technology Enhanced Learning |
| TQM | - | Total Quality Management |
| UG | - | University of Ghana |
| UK | - | United Kingdom |
| UNISA | - | University of South Africa |
| UNZA | - | University of Zambia |
| UPSA | - | University of Professional Studies, Accra |
| VE | - | Virtual Education |
| VLE | - | Virtual Learning Environment |
| WBT | - | Web-Based Training |

# CHAPTER ONE

# INTRODUCTION TO THE STUDY

## 1.1 Introduction

The general purpose of this study is to assess the implementation of knowledge management (KM) systems in Ghanaian universities and the strategies that could be adopted to manage and safeguard knowledge as a competitive advantage and for future use.

This chapter comprises three main sections. The first section presents the background to the study, statement of the problem, purpose of the study, objectives of the study, research questions, justification of the study, and scope and limitations of the study. The second section presents a brief review of existing related literature on the subject. The third section outlines the research methodology for the study as well as the validity and reliability of data collection instruments.

## 1.2 Background to the Study

Societies have become more and more knowledge based. They are focusing on and use knowledge as a key resource (Bousa & Venkitachalam, 2013). As Omotayo (2015:1) opines, organisations are now using knowledge to gain and sustain competitive advantages. This is why organisations understand that what they do not know can become an "Achilles' heel" and a source of advantage for their competitors. Sedaghati (2012:2) further explains that we have moved from the information economy to the knowledge economy, which is the driving force for modern businesses and economies. This calls for the effective management of knowledge by every organisation as an organisational asset. Managing organisational knowledge has not only gained credibility by virtue of the increased research projects on the subject, but also through the increased application of it as a management tool within organisations (Koenig, 2012). It is obvious that KM is being recognised as a valuable intangible asset in its own right and it is key for decision-making and strategy building, the effective exploitation of which determines success for organisations.

In modern organisations, knowledge is an essential resource, especially because it cannot be readily replicated by rival organisations. Organisations that are able to identify, create, disseminate

and effectively manage their knowledge are likely to be more successful than those that do not. Jain (2007) points out that some organisations are unable to function as knowledge-based organisations, because they lack the systems and structures that will enable them to function as such. It is, therefore, important for organisations to have a clear understanding of what knowledge and its management mean to its operations. They need to consider and understand their specific functions and roles, as well as the KM practices and systems that enhance efficiency and lend value to organisational knowledge. An organisation may either function as a production-based, service-based or hybrid-based (production and services) organisation (Lucey, 2005).

Service-based organisations, such as universities, provide intangible products/items (products with no physical form). Universities usually operate in a knowledge-based environment. The practice of KM in universities exists in two major forms. These are organisational knowledge and academic knowledge (Coukos-Semmel, 2003). Organisational knowledge refers to knowledge of the overall setup of the university: its strengths and weaknesses, the markets it serves and the factors critical to the university's success. It includes the group knowledge of the various departments within the university such as all the tacit and explicit knowledge.

Academic knowledge is viewed as the measurable properties of individuals, referring to academic achievement, tests and the body of knowledge resulting from combined academic inquiry in academia and the communities of scholars engaged in research (Hughes, 1999). It enables people within universities to develop a set of practices to collect and acquire knowledge and to share what they know, leading to action, which improves services and outcomes. Academic knowledge is the primary purpose of universities. This is because universities are considered the traditional hub of knowledge production, storage, dissemination and authorisation. They serve as the main instruments of society for the constant pursuit of knowledge and a suitable environment for the application of KM principles and methods (Mikulecká & Mikulecký, 2000:2).

By nature, the university environment seems to be suitable for the application of KM principles and methods (Mikulecká & Mikulecký, 2000:1–2). The main reasons are the following:

- Universities usually possess a modern information infrastructure.
- Knowledge sharing is natural for members of the universities.

- Knowledge acquisition is a natural desire of students, lecturers and administrators.
- There is usually a trustful atmosphere at universities to the extent that members are neither hesitating nor afraid of publishing or otherwise disseminating their knowledge.

Mikulecký and Lodhi (2000:4) opine that, as modern universities are also business organisations with many business activities on the "educational market", any method of improving efficiency and productivity will be useful to and interesting for them. KM seems to be one of the leading approaches in this direction. Mikulecká and Mikulecký (2000:2) also stipulate that the implementation and use of KM systems in universities facilitate and enhance the effectiveness of teaching, research, innovation and learning. It also enhances the decision-making processes, improves internal document management and exploitation and increases the level of information and knowledge dissemination.

A promising direction regarding the application of KM in universities is the development and implementation of KM systems and strategies. KM systems are developed to meet two threatening challenges faced by universities that are seeking a competitive edge in an expanding and information-intensive marketplace. The first is to enable the universities to work better with all the knowledge generated and shared in them by establishing ways of taking control over the sources of the knowledge with the intention not to lose the created and captured knowledge. The other is to enable the universities to use the knowledge to answer typical and complex business questions that they face and that arise based on increasing competition in the fast-changing global economy (Mikulecká & Mikulecký, 2000:2-3). As a result, universities are able to gather relevant data and construct it in a manner that informs the universities how to achieve their goals and objectives.

The process begins with data collection, processing, storage, preservation, retrieval and dissemination. This KM system helps the universities to structure and organise relevant knowledge for effective decision-making in a way that would position them positively for a competitive advantage (Figallo & Rhine, 2002). It is argued that a strategy would help universities to roll out a plan of action that would see them manage their knowledge more effectively. Optimistically, a KM strategy will assist universities to formulate and implement a KM initiative that would see them achieve better knowledge creation and sharing. A KM strategy can also help universities to

outline factors that should be considered when embarking on a KM practice to ensure long-term success during implementation.

Another direction is through the use of communities of practice (CoPs), e-learning, mentorship and apprenticeship, coaching, storytelling, databases, course management systems, repository systems and other technologically and organisationally driven systems. All of these systems could play an important role in the management of the tacit and explicit knowledge that the universities' community members own (Kimble & Hildreth, 2004; Wenger, 2004:3). The main objective of these systems is to establish a structure where knowledge is shared and exchanged among various members within a given domain. They also support teaching, research, learning and administrative activities.

In addition, the setting up and implementation of KM systems in universities are done to improve the efficiency of administrative services and the effectiveness of academic programmes. Specifically, these systems help the universities to:

- focus on and protect their human and intellectual capital
- re-orientate their culture by opting for an optimal knowledge-sharing strategy
- improve decision-making through facilitated access to expertise and leading practices
- increase efficiency and productivity by reducing cases of "reinventing the wheel"
- create links between people and improve innovation through wider and borderless collaboration
- reduce loss of know-how by capturing explicit and tacit knowledge
- increase client satisfaction by delivering value insights
- enhance quality and ability to collaborate by standardising ways of working and enabling discussions with leading experts (Mikulecký & Lodhi, 2000)

In Ghana, various institutions, in conjunction with the Ministry of Education (MoE), the National Accreditation Board (NAB), the National Council for Tertiary Education (NCTE) and the National Board for Professional and Technical Examination (NABPTEX), implemented different KM systems in this area. Some of these systems include repository systems, distance learning, e-learning, CoPs and others in some selected tertiary institutions. Some factors that contributed to

the introduction and implementation of these educational modes, alongside the traditional face-to-face education include: existing traditional tertiary institutions that are unable to meet the high demand for tertiary education due to the rapid growth in population; mismatch between existing academic facilities and physical infrastructure; the increasing number of students qualified and admitted into tertiary institutions and existing structures and facilities that tertiary institutions provide are limited and, in some cases, have no access for people with disabilities and special needs.

Despite the benefits derived from the implementation of the KM systems, Ghanaian universities have problems and experience challenges with the implementation of its KM systems (Addah, Kpebu & Kwapong, 2012:55). Among the problems are the following:

- Inadequate ICT staff to support and implement the systems
- Lack of KM officers to manage the knowledge and KM systems
- Low motivation among lecturers to blend the KM systems, such as e-learning and CoPs into their face-to-face lectures
- Inadequate internet bandwidth to support the systems
- Inadequate content to feed into the KM systems for sharing
- Lack of awareness of the use and benefits of KM systems for the universities and users of the systems
- Lack of strategic KM framework to support the creation and sharing of knowledge
- Poor financing for the acquisition of ICT infrastructure

## 1.3 Statement of the Problem

Irvine and Carmichael (2009) states that a research problem statement is the foundation and a stand-alone statement that explicitly states what it is that the researcher aims to discover or establish. Following the question raised by Creswell and Tashakkori (2007), "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 study is that, although KM systems are implemented and used, there are still problems with retention because strategies are missing.

In addressing this, Ghanaian universities continue to invest in the implementation of KM systems such as ICT infrastructure, internet connectivity, databases, e-learning systems and CoPs to facilitate and improve KM through teaching, research, innovation and learning, which are the core objectives of the universities. However, there is the lack of a formal strategy that would provide an appropriate framework for these systems to ensure maximum utilisation of available intellectual capital for a competitive advantage. Due to this lack of strategy, Ghanaian universities have been continually reinventing the wheel each time they lose knowledge through expertise leaving the universities. This loss of knowledge through expert staff exiting or retiring raises the need to have formal strategies in place that will help the universities to capture that relevant knowledge.

The lack of a KM strategy could be an impediment to the growth of Ghanaian universities, as they are not able to efficiently gather and share appropriate knowledge for the development of the individual members and the university as a whole. Once a KM strategy is determined, the universities would be provided with means that would probably be able to salvage the knowledge situation at hand. As Jenelic (2011:36) states, the ultimate result of a well-created KM process is that every employee in the organisation should fulfil their mission, which reaches the overall corporate objectives and strategies, and identify the most valuable knowledge from the sea of information.

There is also the aspect of lack of remarkable research that compares:

- the key factors which drive the implementation of KM systems in Ghanaian universities
- the factors that enhance the effective use and application of the KM systems in Ghanaian universities
- the strategies that could be adopted to manage and safeguard knowledge for competitive advantage and future use
- the barriers to the implementation and use of the KM systems in universities

The lack of research in this field has created a knowledge gap and uncertainty about whether the implementation of KM systems in Ghanaian universities can help the universities to achieve their core objectives (teaching, research, learning and innovation) and improve the quality of their

service to their communities in the modern knowledge economy. The research problem is further addressed by looking at the research questions and possible sources of data.

## 1.4 Purpose of the Study

The general purpose of this study is to assess the current status of KM systems in Ghanaian universities and the strategies and framework that could be adopted to manage and safeguard knowledge as a competitive advantage and future use.

## 1.5 Objectives of the Study

Efficient and effective KM typically requires an appropriate combination of organisational, social and managerial initiatives, along with the deployment of appropriate systems and infrastructural technologies (Marwick, 2001). Thus, the main objectives of the research are to:

- identify the types of knowledge created, shared and used in the universities
- assess the KM processes (creation, capturing, retention and sharing) at the universities
- assess the KM enablers (leadership, culture, technology and strategy) at the universities
- determine the strategies adopted by the universities to promote and safeguard knowledge
- assess the KM system and facilities at the universities
- assess the impact of KM systems on the universities
- determine the critical success factors and inhibitors to the effectiveness and successful implementation of KM systems at the universities
- develop a framework for the successful implementation of KM systems in universities.

## 1.6 Research Questions

In addressing the research problem and objectives, the following research questions were formulated:

- What are the types of knowledge created, shared and used in the universities?
- What are the KM processes (creation, capturing, retention and sharing) at the universities?
- What are the KM enablers (leadership, culture, technology and strategy) at the universities?
- What are the strategies adopted by the universities to promote and safeguard knowledge?
- What are the KM system and facilities at the universities?
- What is the impact of KM systems on the universities?

- What are the critical success factors and inhibitors to the effectiveness and successful implementation of KM systems at the universities?

## 1.7 Scope and Limitation of the Study

The scope and limitations of the study are discussed below.

### 1.7.1 Scope

This study assessed the implementation of KM systems in Ghanaian universities. It focuses on three universities in Ghana: University of Ghana, Legon (UG); University of Professional Studies, Accra (UPSA); and Ghana Technology University College (GTUC). It also focussed on KM activities at the universities, with specific reference to teaching, research, innovation and learning. Finally, the study focused on the strategies used to manage and safeguard knowledge at the universities.

### 1.7.2 Limitations

As in any research, there were a few limitations to the scope of the study, which need to be stated. Firstly, the study was restricted to Ghana, a developing African country. It is argued that the cultural, economic and political environment of a country can strongly affect an organisation's KM systems' capabilities and, in turn, support and determine its impact on the organisation. Thus, further cross-validation studies in other contexts might strengthen the generalisation or contextualisation of the research findings.

The next limitation of the study is that only faculty members and selected senior administrative staff were involved in the research, representing 11% of the total staff members. Therefore, the opinions and perceptions might be one-sided and might not be representative enough. Further studies may expand the sample size to strengthen the generalisation or contextualisation of the research findings.

## 1.8 Literature Review

A review of relevant literature is an essential piece of any academic work. According to Cooper and Schindler (2011:654), the literature review section of a research work examines recent or

historically significant research studies. It is written to consider the critical points of current knowledge, including substantive findings, as well as theoretical and methodological contributions to a particular topic. It provides an account of what has been authored and published on a topic by credited scholars and researchers (Wilkinson, 2000). Given this scenario, the researcher carried out a literature review to identify and fill the gaps left out by other scholars. A more complete literature review follow in Chapter Two.

Sveiby (2001) and Sharma (2012) assert that researchers and scholars tend to see knowledge as a complex set of dynamic skills, expertise, and so on, that is constantly changing. According to Shrivastava (1998), KM represents the core work of organisations such as schools, colleges, universities, training consultants, corporate training programmes and so on. Pircher and Pausits (2011), similarly, describe the universities as organisations staffed with experts in all sorts of fields who contribute their expertise and experience to the endeavour of producing and preserving knowledge. They serve as the main instruments of society for the constant pursuit of knowledge in a suitable environment for the application of KM principles and methods (Mikulecká & Mikulecký, 2000). Mikulecká and Mikulecký (2000) also indicate that universities can benefit from KM by creating and maintaining relevant knowledge repositories, improving knowledge access, enhancing the knowledge environment and valuing knowledge.

Several authors, including Al-oqaily, Hassan, Rashid and Al-sulami (2014), Hoq and Akter (2012), Wamundila and Ngulube (2011), Mikulecká and Mikulecký (2000), Mohayidin, Man, Kamaruddin and Margono (2007) and Anduvare (2015) investigated KM practices in universities. Although these authors investigated KM practices, these studies were limited in objectives and scope to specific geographical regions and did not adequately establish the strategies that could be adopted to retain critical knowledge in universities or frameworks to guide the successful implementation of KM systems in universities especially in Ghanaian universities.

Al-oqaily et al. (2014) investigate the success factors of KM in universities by focusing on Jordanian private universities. The research established that the Jordanian private universities have the most important and successful factors of KM implementations: organisational culture, effective and systematic processes, knowledge measurement, knowledge organisation and knowledge

systems infrastructure. The findings from the study established that universities should be aware of the distinction between the employees' qualification levels, years of experience and the effectiveness of the IT infrastructures. This is to ensure best adoption of KM implementation in universities. The current study seeks to complement this by identifying the critical success factors of effective KM practices at the universities under study. It will however focus on factors such as leadership, culture, technologies and strategies which were left out by Al-oqaily et al. (2014). This becomes a critical component of the proposed KM framework.

Hoq and Akter (2012) explored the role of knowledge workers in universities. They established that universities are the highest centres of teaching, research, learning and innovation. Their findings indicate that the role of knowledge workers is quite significant, as the universities need to build good information infrastructure and create a conducive atmosphere where all the stakeholders can take part in various KM activities. By promoting KM, knowledge workers can bring about enormous changes in the university's organisational cultures and individual behaviours relative to knowledge. Finally, Hoq and Akter (2012) discovered that universities play a significant role in the building and unhindered development of a knowledge-based society by recruiting skilled and competent knowledge workers and empowering them to manage the knowledge assets effectively. However, this study failed to outline the exact qualification, competence and skills needed to be a knowledge worker. Similarly, it failed to identify or recommend the key person (KM promoter or champion or chief knowledge officer) who is responsible for coordinating and promoting KM at the universities

A study on enhancing knowledge retention at the University of Zambia (UNZA) was done by Wamundila and Ngulube (2011). The study reveals that UNZA reflected an organisation in dire need of business process reengineering with regard to records, policies and documentation management. Wamundila and Ngulube (2011) establish that although policy on training was available, there was no comprehensive policy on other human resources functions such as industrial relations, safety and health and performance appraisal. Further findings from the study show that the policies, processes, procedures and work manuals were not documented, thus breaching the principles of knowledge retention. Notably, the study by Wamundila and Ngulube (2011) establish that knowledge acquisition, creation, sharing and application sustained KM

practice at UNZA. Similarly, some of the knowledge creation strategies adopted by UNZA include training and development, interviews, brainstorming, expert systems, subject matter experts and after-action reviews. This study fails to establish strategies for knowledge retention, rather, established knowledge creation strategies at UNZA.

Several other authors including Mohayidin et al. (2007), Husain and Nazim (2013), Nazim and Mukherjee (2011), and Sarrafzadeh (2008) attempted to conduct studies on KM concept, perception, application and performance in libraries and information centres.

Mohayidin et al. (2007) conducted a study on the application of KM in enhancing the performance of Malaysian universities. The main objective of the study was to assess the level of KM practice among the academics and to determine the factors contributing to the effectiveness of KM practices at individual, faculty and university level. The researchers used factor analysis to determine factors affecting the KM practices while multiple regression analysis was used to analyse and determine the importance of various variables that will add value and thus improve the performance of Malaysian universities. The results indicate that info-structure support; infrastructure capacity; info-culture; and knowledge acquisition, generation, storage and dissemination are important factors in shaping the KM initiatives in Malaysian universities. It was established that info-structure was the most significant variable.

Husain and Nazim (2013) investigated the concepts of KM among library and information science (LIS) professionals. The study established that although the concept of KM emerged in the business sector, its practices have been used in non-profit, public sector, academic institutions and libraries. The study also reveals that: the libraries have both explicit and tacit knowledge embedded in the working processes and experienced employees; KM helps to improve the quality of services rendered to clients; KM perceptions among LIS professionals are varied and they generally view KM as the management of recorded knowledge, instead of sharing and using tacit knowledge embedded in employees; and LIS professionals have positive attitudes towards the application of KM in libraries and they see it as the best method for improving library functions and services. It was also established that LIS professionals' skills in indexing, cataloguing and classification,

authority control and database management are still relevant for KM. However, the LIS professionals need some additional skills such as managerial, leadership and interpersonal skills.

Nazim and Mukherjee (2011) explored LIS professionals' perceptions of KM concepts, its applications and their perceived challenges to incorporate it into academic library practices in developing countries. The study established that the concept of KM was well known to the LIS professionals. However, their degree of understanding of the concepts varied and primarily focused on the management of explicit knowledge. Nazim and Mukherjee (2011) also established that although some of the LIS professionals are informally involved in KM, their roles were perceived as elementary. The respondents believed that the important tools for KM in libraries include CoPs, professional education and training programs, knowledge sharing and information technology. Furthermore, it was revealed that the major constraints for the implementation of KM in libraries are a misunderstanding of the KM concept and a lack of knowledge-sharing culture, incentives and rewards, top management commitment, IT infrastructure and financial resources.

Sarrafzadeh (2005) and Sarrafzadeh (2008) investigated the implications of KM for the LIS professions. The studies focused on Australia, New Zealand, USA, UK, South Africa and Canada. The research findings from Sarrafzadeh (2008) established that LIS professionals regard their expertise and skills as being relevant to KM practice. Although the LIS professionals believed that KM was fundamentally a management concept, they also understood that it was a concept in LIS. The study reveals that although LIS professionals were making a positive contribution to KM in general, their involvement in senior management or leadership positions was a matter of exception. The research establishes that the libraries should be the launching point for KM initiatives. Furthermore, it was revealed that KM is a people-centred phenomenon and this need to be enhanced and promoted. The study finally revealed that KM could contribute positively to an improvement in the prospects of libraries.

To summarise, although a lot of research had been conducted on KM, they failed to provide the exact approach to which KM strategies can be adopted to manage, safeguard and retain critical knowledge at the universities. Similarly, these studies reviewed by the researcher failed to develop and recommend a suitable framework that can be adopted and used to aid the successful

implementation of KM systems in universities. This study does not only complement what the previous researchers have done on KM but also filled the gap left by other researchers by assessing the implementation of KM systems in Ghanaian universities and the strategies that could be adopted to manage and safeguard knowledge as a competitive advantage and for future use. The study not only highlights the KM strategies and framework available in the relevant literature but also strives to provide information and recommend suitable and applicable strategies for knowledge retention and framework to guide the successful implementation of KM systems in universities.

## 1.9 Definition of Key Terms and Concepts

The existence of misunderstanding in human communication is a result of people attaching different meanings and understanding to words used in communication. Due to this, effective researchers seek to discover and avoid this difficulty by clearly explaining the various meanings they assign to key terms and concepts in their investigations. Therefore, defining and explaining terms and concepts are required in order to clarify the meaning and context in which they have been used and to guide the researcher and future researchers.

### 1.9.1 Data

According to Becerra-Fernandez, Gonzalez and Sabherwal (2004:13), the word data is generally defined to refer to the bare facts void of any context. This implies that unarranged facts become data which is a key input in the information-knowledge process. This is the operational definition that would be used throughout this study. It is on this basis that Becker (2007:42) defined data as "a set of discrete, objective facts about events".

### 1.9.2 Information

According to Becker (2007:42), information is data that have been sorted, analysed, displayed and communicated through language, graphic displays or numeric tables. Becerra-Fernandez, et al. (2004:13) also define information as data in context similar to the view of Kalkan (2008:391) that information is data within some meaningful context.

### 1.9.3 Knowledge

Hey (2004:10) explains that the part of knowledge that is more easily definable involves the accumulation and assimilation of multiple pieces of information. Davenport and Prusak (1998:5) define knowledge as a fluid mix of framed experiences, values, contextual information and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. Curley and Kivowitz (2001) defines knowledge as acquaintance with or understanding of a science, art or techniques. That is, knowledge comes with understanding. This understanding helps to distinguish between the various types of knowledge, therefore, it is an essential step for KM (Frost, 2012).

### 1.9.4 Tacit Knowledge

Tacit knowledge, also referred to as intuitive (Horvath, 2000-2001), know-how (Brown & Duguid, 2001), practical, or action-oriented knowledge is based on practice, acquired by personal experience, seldom expressed openly, often resembles intuitions and embodies beliefs and values (Horvath, 2000-2001; Smith, 2012:316). Nonaka and Takeuchi (1995) are of the view that it can be transmitted through social interactions and dialog between individuals or members of organisations.

### 1.9.5 Explicit Knowledge

When tacit knowledge is articulated, it becomes explicit knowledge (Smith, 2012:316). Explicit knowledge, sometimes called know-what (Brown & Duguid 2001), codified (Yeh, 2011), or academic knowledge (Smith, 2012:315) is the knowledge that has been written down, processed by information systems, codified or recorded, archived and protected by organisations (Yeh, 2011). Frost (2012) describes it as the type of knowledge most easily handled by KM systems, which are very effective at facilitating the storage, retrieval and modification of documents and texts.

### 1.9.6 Knowledge Management (KM)

Deloitte and Touch (2000) explain that KM is a discipline that promotes an integrated approach to identifying, capturing, evaluating, retrieving and sharing all of an organisation's information assets. These assets may include people, databases, documents, policies, procedures and

previously uncaptured expertise and experiences in individual workers. Spender and Scherer (2007) further express that KM comprises: processes (the creation, capturing, storing, sharing and effective use of knowledge in an organisation); people (individuals and the roles they play in supporting KM process in the organisation); technology (the tools/infrastructure that an organisation uses to support KM processes) and culture (the norms/traditions of knowledge creation and sharing within an organisation).

### 1.9.7 Knowledge Management Strategy

A KM strategy is simply a blueprint that describes how an organisation will better manage its knowledge resources/assets for the benefit of an organisation and its stakeholders. It describes the approach an organisation wishes to follow in the management of its knowledge assets, i.e. a description of approaches, methodologies and tools (Shannak, Masadeh, Al-zubi, Obeidat and Alshurideh, 2013:146). Finally, it defines the business case, develops a future state model, pinpoints the most significant strategic recommendations from experts in the field and creates a roadmap for implementing all processes. It also helps an organisation to identify the performance gap between the current workflow and the optimal workflow required to achieve strategic objectives (Warner, 2011; Kane, 2014).

### 1.9.8 Knowledge Management Framework

The KM framework describes how KM elements (processes, technologies, structures, accountabilities and governance) should be in place, aligned and interconnected in a manner that supports the achievement of an organisation's goals (Biloslavo, 2005). This ensures that there are no gaps in the system and that there is a free flow of knowledge through the organisation. The KM framework usually provides organisations with the essential areas for consideration in KM efforts. It helps organisations to approach KM methodically and consciously (Okunoye & Karsten, 2002).

### 1.9.9 Knowledge Management Systems

KM systems are the tools or technologies that facilitate the creation, organising, storing, transfer, sharing and application of knowledge in an organisation (Alavi & Leidner, 2001:3). These technological systems process and generate value from their intellectual and knowledge-based assets. In other words, KM systems are repositories of knowledge from a collection of experts,

organised in a manner such that it can be accessed easily (Chandran & Kavitha 2009:158). In universities, these technologically based tools include groupware systems and KM 2.0, the intranet and extranet, data warehousing and mining, decision support systems, content management systems, document management systems, artificial intelligence tools, simulation tools, semantic networks (Bali, Wickramasinghe & Lehaney, 2009); portal, profile, collaborative workspaces, urgent requests, document libraries, servers, databases, knowledge bases, blogs and advanced search tools; e-learning systems and communities of practice (Capozzi, 2007).

### 1.9.10 Knowledge Management Enablers

KM enablers are the driving force or factors that foster the development of knowledge through a typical KM process and are of critical importance for the success or failure of an organisation (Arthur, Andersen & APQC, 1996). Arthur et al. (1996) stress organisational culture, leadership, technology, strategy and people as the KM enablers of an organisation.

### 1.9.11 Knowledge Management Processes

KM processes are the observable organisational activities that are related to KM. The processes of KM involve knowledge acquisition, creation, refinement, storage, transfer, sharing and utilisation (Zaim, 2006:3). The KM function in the organisation operates these processes, develops methodologies and systems to support them and motivates people to participate in them (King, 2009:4; Zaim, 2006).

### 1.9.12 Communities of Practice (CoP)

According to Wenger (2014), "CoPs are formed by people who engage in a process of collective learning in a shared domain of human endeavour: a tribe learning to survive, a band of artists seeking new forms of expression, a group of engineers working on similar problems, a clique of pupils defining their identity in the school, a network of surgeons exploring novel techniques, a gathering of first-time managers helping each other cope. In a nutshell: CoPs are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly". CoPs serve as key vehicles for dialogue with the 'academic voice' and for mutual support for the exchange of ideas and the sharing of good practice between different role groups involved in universities' teaching and learning agenda (Wenger,2014).

### 1.9.13 E-learning

According to Itmazi (2011), e-learning is the use of new multimedia technologies and the internet to improve the quality of learning by facilitating access to resources and services, as well as remote exchanges and collaboration. Itmazi (2011) also states that the learning process needs techniques and tools to present the knowledge (from different resources), interact with it and share it with others. These tools serve as platform for KM in universities. Browaeys (2006) concludes that e-learning is an umbrella term that covers KM anytime, anywhere (asynchronous), on a computer and usually connected to a network.

### 1.9.14 Mentoring

Mentoring is a term that is generally used to describe the relationship between a less experienced individual (mentee or protégé) and a more experienced individual (mentor) (Wai-Packard, 2008:1). Traditionally, it is viewed as a dyadic, face-to-face and long-term relationship between a supervisory adult and a novice that fosters the mentee's professional, academic or personal development (Conrad & Donaldson, 2004). The mentor shares his/her skills, expertise, knowledge, techniques, know-how, best practices and experience to provide a comprehensive hands-on training experience for the mentee (Ensher, Thomas & Murphy, 2001:421).

### 1.9.15 Apprenticeship

The International Labour Organisation (ILO) defines apprenticeship in its Apprenticeship Recommendation (R60, 1939) as any system by which an employer undertakes by contract to employ a young person and to train them or have them trained systematically for a trade for a period, the duration of which has been fixed in advance and in the course of which the apprentice is bound to work in the employer's service. Ryan (2010) also expresses that apprenticeship denotes training programmes that combine vocational education with work-based learning for an intermediate occupational skill (i.e. more than routinised job training) and that are subject to externally imposed training standards, particularly for their workplace component.

### 1.9.16 Coaching

Coaching is concerned primarily with performance and the development of definable skills. It usually starts with the learning goal already identified (Benabou & Benabou, 2000; Clutterbuck, 2001). The most effective coaches share with mentee(s) the capability to help the learner develop the skills of listening to and observing themselves, which leads to much faster acquisition of skills and modification of behaviour. Coaches also share with mentees the role of critical friend – confronting executives with truths no one else feels able to address with them (Clutterbuck, 2001).

### 1.9.17 Knowledge Management System Implementation

According to Albers (2009), the decision to implement KM systems in organisations needs strong support (technical and non-technical) to be successful. KM practitioners and researchers have tried to establish some specific protocols for implementing KM concepts, techniques and practices. Some KM implementation procedures at organisations on which research had been done, often include various common stages such as planning, initiation, development and integration (Oliveira, Caldeira & Romao, 2012). Rao (2014) developed the 8-C (Connectivity, Content, Community, Culture, Capacity, Cooperation, Commerce and Capital) framework for implementing KM.

Malhotra (2000), Albers (2009) and Lingham (2010) concur on the 10-step road map to implementing a KM system. They explain that this road map serves as a methodology and guideline for strategising, designing, developing and implementing KM system initiatives with a specific organisation in mind. The 10-step KM road map is categorised into four phases:

1. Phase 1: Infrastructural Evaluation
    - Step 1: Analysis of existing infrastructure
    - Step 2: Aligning KM and business strategy
2. Phase 2: KM system Analysis, Design and Development
    - Step 3: Designing the KM architecture and integrating existing infrastructure
    - Step 4: Auditing and analysing existing knowledge
    - Step 5: Designing the KM team
    - Step 6: Creating the KM blueprint
    - Step 7: Developing the KM system
3. Phase 3: Deployment

- Step 8: Deploying with results-driven incrementalism (RDI) methodology
- Step 9: Leadership issues

4. Phase 4: Metrics for Performance Evaluation
    - Step 10: Real-options analysis of returns and performance

## 1.10 Originality of Study

Phillips and Pugh (1999:61) express that a Doctor of Philosophy (PhD) degree is awarded for an original contribution to knowledge. Phillips and Pugh (1994:61–62) also argue that such research can be original in a number of ways such as:

- setting down a major piece of new information in writing for the first time
- continuing a previously original piece of work
- trying out something in a country that has previously only been done in other countries
- looking at areas that people in the discipline have not looked at before
- carrying out original work designed by the supervisor
- providing a single original technique, observation or result in an otherwise unoriginal but competent piece of research
- showing originality in testing somebody's ideas
- taking a particular technique and applying it in a new area
- bringing, new evidence to bear on an old issue
- being cross-disciplinary and using different methodologies
- adding to knowledge in a way that has not been done previously

Originality in this study was premised on collecting and analysing pieces of data and presenting the information for the first time. No studies have been done on KM systems implementation in Ghanaian universities, which makes this particular study original. In fact, as far as this researcher could establish, there was no comprehensive and structured study or research done on any aspect of KM systems implementation in universities in Ghana. Not only does it contribute to the knowledge of KM research, but it also adds to the existing literature on the progress of KM development in relation to organisational performance, KM strategies, KM frameworks and KM critical success factors in universities and other institutions internationally.

Originality, in this study, also relates to how the implementation of KM systems aid in acquiring, capturing, processing and retaining knowledge at the selected universities 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 by scholars such as Nonaka (1991; 1995), Grant and Grant (2008), Ramohlale (2014), Appiah (2014) and Chigada (2014), which focused on strategies, topologies or significance of KM, this study focused on the assessment of the implementation of KM systems in Ghanaian universities and the strategies that could be adopted to manage and safeguard knowledge as a competitive advantage and for future use.

## 1.11 Research Methodology

Research methodology is understood as the science of studying how research is done scientifically. In it, the researcher examines and explains the various steps that are generally adopted in studying and solving the research problem. Chapter Three of this study will discuss the research methodology comprehensively.

### 1.11.1 Research Approach

The mixed method approach was applied in this research. According to Creswell (2008), the mixed research method is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches for the purposes of breadth and depth of understanding and corroboration. The use of mixed research for this study is justified based on Cooper and Schindler's work (2011) as it increases the perceived quality of the research, especially when the qualitative study follows the quantitative one and provides a validation for the findings.

The researcher started with the collection of quantitative data and then used qualitative instruments (interview) to find answers to pertinent questions and issues that were insufficiently addressed in the responses to the questionnaires. As Creswell (2008) puts it, the mixed method research approach helps to answer questions that cannot be answered by either the quantitative or the qualitative approach alone. The quantitative approach used was used to ask all participants identical questions in the same order. In some cases, priority was given to the interview (qualitative approach) because the researcher was dealing directly with the respondents. This gave the researcher the opportunity to probe for further answers that were provided by the interviewees

during the interview process. The use of the qualitative research approach in this study helped to collect data by means of interview. It allowed the participants the opportunity to give their own views, stories and understanding as far as KM practices and usage in the universities are concerned.

### 1.11.2 Survey Research

The survey research design was used in this study. Survey research involves the collection of data/information from a sample of individuals through their responses to questions by using the questionnaire, interview and/or observation (Cooper & Schindler, 2011). The researcher therefore made use of the survey research since the study involved a large population and covered a geographically dispersed population. The selected participants were considered, however, as one unit for the purpose of analysis. The use of the survey strategy in this study enabled the researcher to gather data by means of the opinions of sampled respondents about the implementation and use of KM systems in universities. Hence, data was gathered from a sample of faculty members and senior administrative staff (library, registry and ICT staff).

### 1.11.3 Population and Sampling

The population for this study comprised three universities with a total staff strength of 1337 – 1055 faculty members and 282 senior administrative staff. The selection of the three universities took into consideration the need to have representation of public and private universities; autonomous and semi-autonomous universities; and technical/technological, research and professional universities. The location or accessibility and the state of the KM practice at the university were also taken into consideration. These universities are: University of Ghana, Legon (752 faculty members and 142 senior administrative staff); University of Professional Studies, Accra (171 faculty members and 91 senior administrative staff) and Ghana Technology University College (132 faculty members and 49 senior administrative staff). The researcher used the stratified sampling technique to divide the population into two strata, which consisted of faculty members and senior administrative staff. A 10% sample size was selected from this population with an additional 10% error margin on the sample. Alreck and Settle (1985), Seaberg (1988), Neuman (2000:217), Grinnell (2001) and Grinnel and Unrau (2004) suggest that a 10% sample size, especially for a large population, is good enough to draw valid and reliable data. Cochran (1963) also suggests an additional 10 percent error margin of a sample size to be added to the sample.

This represents 11% of the total population. To this end, a total sample size of 147 was considered for this study.

### 1.11.4 Instrumentation

This study employed mixed methods in order to obtain reliable data and valid results. The researcher used the questionnaire and interview to gather primary data for this study. The questionnaire consisted of closed-ended and open-ended questions. A semi-structured interview was adopted and this created a conversational partnership between the researcher and the respondents. It afforded the researcher the opportunity to follow up on data/probes provided by the respondents, thus, enabling additional information not disclosed in the questionnaire.

The concept of triangulation is based on the assumption that any bias inherent in a particular data source, instrument and method would be neutralised when used in conjunction with other data source(s) (Creswell, 2008). The combination of these instruments enabled the strengths of one method to counteract the weaknesses of the other and it helped to check the validity of the findings and to generate a rich profile on KM system in the Ghanaian universities.

In addition, the researcher triangulated the data collection instruments and found that they complemented each other. The idea of combining them in a single study owes much to the past discussions about mixing methods (quantitative and qualitative), linking approaches and combining research designs in all phases of the study. The triangulation was not just to compare and contrast results, but also to obtain a rich set of data, thus enabling the researcher to develop complete and well-substantiated conclusions about the impact of the KM systems and strategies on the universities.

### 1.11.5 Data Analysis

In this study, the data analysis went through two main stages. The first stage is the data preparation. This involved organising, piling up, typing field notes and recordings and sorting the data. By preparing the data, it became an "intelligible product" for the researcher to read, edit for accuracy, comment on, code and analyse. The second component is the analysis itself. The researcher

analysed the data by coding the refined (prepared) data and made it ready for analysis. The statistical package for the social scientist (SPSS) was employed at this stage of the analysis.

### 1.12 Ethical Consideration

Ethics is the branch of philosophy that comprises systematising, defending and recommending theories of right and wrong conduct. In research, ethics involves the application of essential ethical principles to a variety of research work, including scientific research. Several factors may confront researchers. This study was guided by the Unisa Policy on Research Ethics (Unisa, 2007:9). The researcher was guided by the assertion by Babbie and Mouton (2001:525) that the researcher has a right to search for truth, but not at the expense of the rights of other individuals. The researcher has the right to collect data by means of interviewing people, but not at the expense of the interviewee's right to privacy.

This study was approved by the Department of Information Science of the University of South Africa (Unisa) and cleared by Unisa's Research Ethics Board before being undertaken. These processes were undertaken to ensure compliance with the Unisa Policy on Research Ethics (2007). The policy specifies that researchers must avoid undertaking secret or classified research. In doing so, the study ensured that the following ethical dimensions were addressed to avoid diluting the research process. The following ethical issues were taken into consideration for the purpose of the study: inducement to participate, planning the research, responsibility, personal information and honesty.

**Inducement to participate:** Embedded in mixed method research are the concepts of relationships and power between participants and researchers. The wish to participate in a research study depends on a participant's preparedness to share his or her knowledge. Individual's participation in this study was freely given, specific and based on informed consent. Direct or indirect compulsion, as well as undue inducement of participants in the name of research, was avoided. The researcher informed participants of the purpose of the study and the study participants were advised that participation in the study is voluntary.

**Planning the research:** The researcher drafted and properly executed a research plan to avoid reporting of misleading results. Steps were also taken to protect and ensure the dignity of participants as well as those that could be affected by the results of the study.

**Responsibility:** According to Unisa (2007), researchers need to maintain the dignity and welfare of their participants. This entails protecting participants from harm, unnecessary risks and mental or physical discomfort that may be inherent in the research procedure. The researcher ensured that participants' dignity and anonymity were protected. Interviews were conducted in safe environments.

**Personal information:** The researcher was guided by the assertion by Esterberg (2002:53–54) that the researcher should ensure that the participants in the study are duly protected in terms of confidentiality during the process of data collection, analysis and publishing of the theses or when disseminating the outcomes of the study. It is also advisable for the researcher to protect the names of the participants and the institution or community being researched. The researcher ensured that participants' personal information was not discussed with any third parties. During data collection, participants were advised not to write their names on the questionnaires.

**Honesty:** The research was conducted in an honest, fair and transparent manner and the participants were informed of the purpose and benefits of the study. The participants were randomly selected (to eliminate favouritism) when the questionnaires are sent out.

## 1.13 Significance of the Study

The significance of performing a detailed study of the assessment of KM systems in Ghanaian universities cannot be overstated. This study is significant and quite timely, considering the challenges being faced by Ghanaian universities with regard to KM. Universities are faced with problems such as employees with specific knowledge leaving the employment of the university, which leads to knowledge loss; over-reliance on key employees to solve problems in the university, which leads to the proverbial reinvention of the wheel whenever they leave the university; much data/information/knowledge available in the universities, but not centralised, which leads to

duplication and additional external pressures; and competition arising because of information technology. Ghanaian universities are not exempt from these problems.

Furthermore, while these universities are producing and acquiring knowledge, they have not set up proper guidelines and frameworks to identify, manage and safeguard the key knowledge so that it can be made available for the success of the universities. Therefore, the topic for the research was identified as it aided the researcher in identifying key knowledge-related issues and therefore concludes and suggests strategies that would help make KM practicable in Ghanaian universities. In this regard, it is hoped that this study will make an original, significant contribution towards the existing body of knowledge in the field of KM in Ghanaian universities. Better KM practices will most probably enable universities in Ghana to acquire and sustain a competitive edge. The universities' authorities might be enabled to identify critical factors that could affect the successful implementation of KM systems and adopt the suggestions and recommendations of the study, which will be based on the research findings.

In addition to this, the study will hopefully stimulate the interest in top management to create KM systems, platforms and knowledge centres where Chief Knowledge Officers/Managers (CKO/M) might be appointed to spearhead KM at the universities. The study highlighted the critical success factors (CSF) and the contributions of information technology to KM by creating databases/repositories for collecting, organising and storing information to facilitate the transfer of and access to knowledge. Developments in KM have to be concerned with less data and more organisational learning, especially the transfer of best practices and the management of intellectual property. Thus, it will hopefully provide opportunities to the universities and other organisations to reconsider their perception and stance on the critical success factors and the role of information technology solutions in KM. The study recorded, analysed and determined the role that KM systems play in the universities' performance.

It is also expected that the benefits of the research findings may help other institutions of higher education (IHE) and organisations to deal with issues pertaining to KM and their practices. It was thus the intention of the researcher to grab the opportunity to advance the cause of KM and to help Ghanaian universities become better and progressive universities. Furthermore, this study can

serve as an instrument for identifying the extent to which Ghanaian universities deal with KM and how they use can KM to improve and become innovative.

## 1.14 Outline of the Study

This thesis consists of preliminary pages, seven chapters, references and appendices:

**Chapter 1 – Introduction and discussion of theoretical background of the study**

This chapter draws a comprehensive picture of the study as a whole and sets out the foundations for the following chapters. It provides an introduction and the theoretical background and context of the study; and it gives the problem statement and a brief description of the research issues, research objectives and research questions. In addition, this chapter explains the significance of the study, delimitation of scope the study, definition of key concepts, originality of the study and research methodology.

**Chapter 2 – Literature review**

Chapter 2 reviews literature on relevant topics based on the set objectives, including knowledge pyramid and KM concept, KM process, KM systems, KM framework, KM strategy, KM enablers, KM implementation and KM in universities.

**Chapter 3 – Historical overview of the selected universities**

This chapter discusses the background and profile of tertiary education in Ghana and the three universities that were selected for this study and how they can use KM to improve and became innovative: University of Ghana, Legon (UG); University of Professional Studies, Accra (UPSA); and Ghana Technology University College (GTUC).

**Chapter 4 – Research methodology**

This chapter provides a justification of the research methodology and details of the research design process used. In particular, the chapter focuses on the research approach, survey research, population and sampling procedures and data collection and analysis.

**Chapter 5 – Data analysis and presentation of research findings**

This section codes and analyses the questionnaires and interview guide. The Statistical Package for the Social Scientist (SPSS) was used in analysing the data collected from the respondents and the findings are presented using descriptive, chart and tables.

**Chapter 6 – Interpretation and discussion of results and findings**

Discussions of the results and findings are included in this chapter. It describes the basic information derived from the analysis of the data collected.

**Chapter 7 – Summary, conclusion and recommendations**

This chapter is the final chapter of the thesis. It draws conclusions about the research issues by linking the research objective and questions identified in Chapter One with the main findings. In addition, the chapter discusses the theoretical contributions and practical implications of the research. Recommendations for future research are also provided.

## 1.15 Summary

This chapter presents the background to the study, statement of the problem, purpose of the study, objectives of the study, research questions, justification of the study, and scope and limitations of the study. It also presents a brief review of existing related literature on the subject and the research methodology for the study as well as the validity and reliability of data collection instruments.

The next chapter, Chapter Two, will present a review of relevant literature in KM systems in organisations, particularly the relevance of KM systems implementation in universities.

# CHAPTER TWO
# LITERATURE REVIEW

## 2.1 Introduction

The previous chapter, Chapter One, provided an introduction and discussion of the theoretical background to the study of KM in organisations (university). This chapter of the study, Chapter Two, expounds concepts of KM and reviews some research studies and published literature on KM, with particular focus on the knowledge pyramid, KM concept, KM systems, KM strategies, KM critical success factors, KM implementation stages and KM frameworks. Furthermore, studies related to KM implementation in universities, libraries and information centres and Ghanaian universities were reviewed.

## 2.2 Literature Review

A review of relevant literature is an essential piece of any academic work. According to Cooper (2011:654), the literature review section of a research work examines recent or historically significant research studies. It is written to consider the critical points of current knowledge, including substantive findings, as well as theoretical and methodological contributions to a particular topic. It provides an account of what has been written and published on a topic by credited scholars and researchers (Wilkinson, 2000).

While the objective of a literature review is to augment one's argument, it also summarises and synthesises the ideas that others have already put forward. This is because a summary of a literature review is an outline of the important information about the resources. Reviewing scholarship enhances the interpretation of old material to bring forth new ideas in the area of KM in universities. Bless and Higson-Smith (1995:23) state that the purpose of a literature review is to sharpen and deepen the theoretical framework, to familiarise the researcher with the latest developments in the area of research and to identify weaknesses and gaps in knowledge. The University of Leicester (2012) outlines that the ability to review and report on relevant literature is a key academic skill. Thus, literature reviews:

- situate the research focus in the context of the wider academic community in a particular field

- report the critical review of the relevant literature
- identify a gap in the literature that the research will attempt to address

Leedy and Ormrod (2005:80) suggest that in the summary of a literature review, the researcher gathers up all that has been said and describes its importance in terms of the research problem. After reviewing relevant literature to the current study, the researcher was able to trace the intellectual progression of the field of KM, including major debates. According to Webster and Watson (2002), an effective review of relevant literature creates a strong foundation for advancing knowledge. It facilitates theory development, closes areas where there is an excess of research and unearths areas where research is needed. It is usually a secondary source and, as such, does not report any new or original report or findings.

According to Hart (1998:15), a literature review goes through transitions depending on the level of research. The transition is from descriptive through analytical and summative, to an analytical synthesis. The descriptive review is fundamentally for undergraduate studies, which essentially focus on topics, revealing of contemporary sources on a topic and analysing the related topic. The analytical and summative review is for the first level of postgraduate studies (master's level). It involves the demonstration of knowledge of theoretical issues relevant to the topic. At the PhD level, the analytical synthesis is usually applicable.

For a Doctor of Philosophy, Hart (1998:15) states that the candidate is normally expected to use analytical synthesis covering all known literature on the topic, a high-level conceptual linking within and across theories, a summative and formative evaluation of previous work, an in-depth discussion of relevant philosophical traditions and the ways they relate to the PhD focus.

## 2.3 Knowledge Pyramid

Different scholars refer to the data, information and knowledge (DIK) pyramid by different names. In most of the KM literature, the pyramid is referred to as the "Knowledge Hierarchy", while the information science domain refers to the same pyramid as the "Information Hierarchy" (Rowley& Heartly, 2007) and "Knowledge Pyramid" (Sharma, 2008).

T.S. Eliot laid the groundwork and predicted the discussion of DIK that has continued from his poetic lines in 1934:

- "Where is the life we have lost in living?
- Where is the wisdom we have lost in knowledge?
- Where is the knowledge we have lost in the information"?

Eliot (1934) suggested a chain, a hierarchy and a distinct relationship between each of these concepts by relating wisdom to knowledge and knowledge to information. This hierarchy also suggests that one can affect the other and even can be changed into another. These ideas have remained and have been analysed and discussed in many different forums, including Ackoff (1989), Rowley and Heartley (2007), Frické (2008), Muller (2011), Frost (2014; 2015) and many more.

The DIK hierarchy was made prominent by Russell Ackoff in his address accepting the presidency of the International Society for General Systems Research (ISGSR) in 1989. Ackoff (1989) used the hierarchy to explain how information systems could be used to organise data and make it accessible and how knowledge systems could apply information to specific tasks and since these systems rely on logic, these can be programmed and automated. However, Ackoff (1989:9) notes that wisdom-generating systems are ones that man will never be able to assign to automata. It may well be that wisdom, which is essential to the effective pursuit of ideals and the pursuit of ideals itself, are the characteristics that differentiate man from machines.

In providing a comprehensive review of the knowledge pyramid literature, Jennifer Rowley identified significant ambiguity and gaps in the relationships between the DIK elements and that "wisdom is a neglected concept in KM" (Rowley & Heartley, 2007:178). Frické (2008:136) also argues that data has no relationship to information and that the notion of its relationship is totally flawed. In his argument, he mentions that to infer information from data assumes the truthfulness of the data and concludes that the inferences must then be also true. This inductive assumption cannot be sustained. In addition, he argues that there is not "a special category of 'data' which can serve as the bedrock for all else." Thus, the hierarchy is without foundation.

While the discussion on the DIK relationship continues, Da Vinci (2008) is of the opinion that the academic community has spent years discussing and clarifying what constitutes data, information and knowledge. In his view, variations emerge in the definitions and the basic terminology used in these definitions depends on the background of the author and the specific aims he/she pursues. However, in the view of Liew (2007), the definitions of data, information and knowledge are entrapped in a logical fallacy known as circular definition. Liew (2007) presents a common phenomenon in the defining of data, information and knowledge. To her, describing the interrelationships does not constitute a definition. Defining them and describing their interrelationships are two distinct issues. However, there are some agreements in some of the definitions without the fallacy.

### 2.3.1 Data and Information

The concept of data has gone through a variety of definitions by different people, largely depending on the context of its use, the field of study and the background of the scholar. Davenport and Prusak (1998) define data as discrete and objective facts about an event: a purchase transaction, a price, or the name of a company that is represented in a symbolic manner, like in numbers or letters. Data on its own lack relevance or purpose because it cannot explain aspects about the event, such as why it happened, or predict its outcome. Nevertheless, data are the raw material that organisations need to operate and to answer questions such as what, where, when, who, how big, or how many. Lucey (2005:15-16) summarised it by saying that data are raw facts that have no context or meaning of its own.

Shannon (1948), Zins (2007:479) and Reddy (2007:5) also define data as conceived of symbols or signs, representing stimuli or signals that are "of no use until in a useable (that is relevant) form". Zeleny (2005:15–16) characterises this as "know-nothing". In terms of the sources of data (data source), Hey (2004:10) explains that they are computer files and data streams that can be placed in storage databases or filed in repositories. It is discrete, can pile up, be recorded and manipulated, or captured and retrieved. It can exist naturally (need only to be recorded) or can be created artificially (often produced as a by-product of a business process) (Bocij, Chaffey, Greasley & Hickie, 2003:5).

The word ‘data’ is sometimes used interchangeably with the word ‘information’. However, for information managers, the terms ‘data’ and ‘information’ have distinct meanings (Lucey, 2005:15). In simple terms, information consists of facts and data that are organised to describe a particular situation or problem (Hey, 2004:10) that is interpreted and understood by the recipients of the massage (Lucey, 2005:17). Data becomes information when it is analysed, summarised or processed in some way to produce a message or a report, which is conventionally deemed to be ‘management information’ and it is understood by the recipient (Lucey, 2005:17). Information is endowed with relevance and purpose. Therefore, information has a meaning, is relevant and has a purpose, which is to aid in making decisions and/or solving problems or realising an opportunity. It provides answers to "who, what, where and when" questions (Ackoff, 1989).

Finally, Davenport and Prusak (1998) opine that information is data that have gone through several processes such as:

- Contextualisation: by explaining the purpose of the data
- Categorisation: by defining data into units of analysis or key components
- Calculating: by analysing the data using mathematics or statistics
- Correction: by removing errors from data
- Condensation: by summarising data to form a concise message

### 2.3.2 Knowledge

The definition of knowledge is complex and controversial and can be interpreted in many different ways (Chaudhary, 2005:16). It is used interchangeably in practice as well as in literature, with intangible assets, capabilities, core competence or even skills (Chaudhary, 2005:16). Alvesson and Kärreman (2001:99) point out that knowledge is a vague concept because it has been applied to facts (encyclopaedic); instructions on how to carry out an activity (procedural); determination of when is it appropriate to use encyclopaedic or procedural knowledge (social); or determination of the reason why (explanatory). Alvesson and Kärreman (2001) warn that knowledge is not always objective, reliable, functional, useful and, generally, good thing. Hence, users need to be aware of its distinguishing features.

Adjei and Dei (2015) and Hey (2004:10) explains that the part of knowledge that is more easily definable involves the accumulation and assimilation of multiple pieces of information, once again providing structure to it in the form of relationships between the information and internalising, or personalising that knowledge by bringing it from the outside 'into' to the mind. Davenport and Prusak (1998:5) define knowledge as a fluid mix of framed experience, values, contextual information and expert insight that provide a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers.

Hara and Schwen (2000:8) and Dagar (2016) state that knowledge is a social constructivist paradigm which is viewed as both an individual and a social process, because knowledge is constructed individually and collectively. According to Hara and Schwen (2000:8) and Dagar (2016), knowing is a process of gaining situated understanding that a person or a group of people has acquired through experience in social contexts. This type of knowledge includes know-how, which is directly related to competitiveness and productivity of an organisation although it may be transient and incomplete. According to Eddy (2004), knowledge from the constructive paradigm is generated by humans through a series of interaction between their experiences and their ideas.

Nazari (2012:23) identifies three (3) frameworks to explain knowledge. According to him, knowledge is:

1. connected: It exists in a collection (collective wisdom) of multiple experiences and perspectives
2. a catalyst/action: Knowledge is always relevant to environmental conditions and stimulates action in response to these conditions. Information that does not precipitate action of some kind is not knowledge, i.e. knowledge mostly exists only in application
3. applicable in un-encountered environments: Information becomes knowledge when it is used to address novel situations for which no direct precedent exists. Information that is merely "plugged in" to a previously encountered model is not knowledge and lacks innovation.

#### 2.3.2.1 Taxonomies of Knowledge

Knowledge comes with understanding. This understanding helps to distinguish between the various forms and types of knowledge, hence, it is an essential step for KM (Frost, 2012). According to Sanghani (2009), the understanding of the philosophy of knowledge largely divides into debates about the questions "What is possible to know (ontology)?" and "How can we be certain of what we know (epistemology)?"

The Greek philosopher Aristotle classified knowledge into episteme knowledge (abstract generalisations, basis and essence of sciences and scientific laws and principles); techne knowledge (technical know-how, being able to get things done, manuals and communities of practice); prognosis knowledge (practical wisdom, drawn from social practice); and metis knowledge (it is what the flair). Polanyi (1962), Nonaka (1994), Nonaka and Takeuchi (1995), Nonaka and Konno (1998) and Ready (2007) mention tacit and explicit knowledge while Hasan and Al-hawari (2003) mention the semi-explicit and semi-tacit knowledge.

The other types of knowledge are: knowledge of facts, knowledge of facts acquaintance, knowledge of how to do things, practical knowledge, intellectual knowledge, small-talk and pastime knowledge, spiritual knowledge and unwanted knowledge (Machlup, 1962); proprietary, public, personal and common sense knowledge (Boisot, 1987); logical, semantic, systemic and empirical knowledge (Pecorino, 2000); general and specific knowledge (Grant, 1996; Nickols, 2000); individual and group (collective) knowledge (De Vasconcelos & Kimble, 2001); core, advanced and innovative knowledge (Khandelwal & Gottschalk, 2003); shallow, deep, semantic and episodic knowledge (Awad & Ghaziri, 2003); and Frost (2012) mention embedded and embodied knowledge.

Quinn, Anderson and Finkelstein (1996) divide knowledge into cognitive knowledge (know-what), advanced skills (know-how), systems understanding (know-why) and self-motivated creativity (care-why). Millar, Demaid and Quintas (1997) concentrate on what knowledge is about and specify catalogue knowledge (know-what), explanatory knowledge (know-why), process knowledge (know-how), social knowledge (know-who) and experiential knowledge (what-was). Blackler (1995) focuses on where the knowledge is situated and thus categorised knowledge as

embrained (cognitive), embodied (perceptual), cultured (social), embedded (systematised) and encoded (formal or symbolic). Boisot (1987) considers knowledge to be either codified or uncodified and diffused or undiffused. DeLong and Fahey (2000) also contend that there are three distinct types of knowledge: human knowledge, social knowledge and structured knowledge.

#### 2.3.2.1.1 Tacit and Explicit Knowledge

Tacit knowledge, also referred to as intuitive (Horvath, 2000-2001), know-how (Brown & Duguid, 2001), practical, or action-oriented knowledge, was originally identified and defined by Polanyi in 1962. It is based on practice, acquired by personal experience, seldom expressed openly, often resembles intuitions and embodies beliefs and values (Horvath, 2000-2001; Smith, 2012:316). Because of this, tacit knowledge is often context dependent and personal in nature (Gamble & Blackwell, 2001).

Qi and Meloche (2005) and Wellman (2009) feel that tacit knowledge is actionable knowledge and, therefore, the most valuable. Wellman (2009) regards it as the most valuable source of knowledge and the most likely to lead to breakthroughs in the organisation. Nonaka and Takeuchi (1995) are of the view that it can be transmitted through social interactions and dialog between individuals or members of organisations. That is, through the socialisation component of the SECI (socialisation, externalisation, combination, internalisation) model. Jain (2011) is also of the view that tacit knowledge can be achieved through face-to-face interactions, discussions, experience sharing, meetings, storytelling, observation, teleconferencing and electronic discussions. Furthermore, tacit knowledge is the most important basis for the generation of new knowledge (Nonaka, 1994).

According to Nonaka and Takeuchi (1995), Tiwana (2008) and Fombad (2009), tacit knowledge is the most important and, generally, more valued knowledge in organisations because of its fast-changing nature, since it can determine to what extent organisations will be competitive in a turbulent market. This type of knowledge is mainly found in universities, since they mainly consist of experts from different fields of knowledge or study (Mikulecká & Mikulecký, 2000:47). During the data collection, the researcher identified the tacit knowledge as one of the primary type of knowledge found in the selected universities.

When tacit knowledge is articulated, it becomes explicit knowledge (Smith, 2012:316). Explicit knowledge, sometimes called know-what (Brown & Duguid 2001), codified (Yeh, 2011), or academic knowledge (Smith, 2012:315) is the knowledge that has been written down, processed by information systems, codified or recorded, archived and protected by organisations (Yeh, 2011). It is a formalised knowledge. It is therefore fairly easy to identify, store and retrieve (Wellman 2009). Frost (2012) describes it as the type of knowledge most easily handled by KM systems, which are very effective at facilitating the storage, retrieval and modification of documents and texts. Explicit knowledge is represented by some artefact, such as a document or a video, which has typically been created with the goal of communicating with another person (Nonaka, 1994).

From a university perspective, explicit knowledge is kept in publications, journals, textbooks, lecture notes, routine records, electronic archival systems (databases), e-mails, policies and on the university's portals.

## 2.4 Knowledge Management

Subsequent to the above discussion of the knowledge pyramid and the taxonomies of knowledge, this part of the literature review considers the related topics of the KM discipline, consisting of the historical development, concept and definition KM in organisations.

### 2.4.1 Knowledge Management Concept

According to Sveiby (2001), the concept of KM is best defined from how the scholars and people view and use them. While scholars like Mullins (1997), Loudes (1999), Zack (1999), Frost (2012), KnowledgePoint (2014) and Anduvare (2015) think knowledge can be managed, while others like Drucker (1969), Nonaka (1994), Sveiby (2001), Kontzer (2001) and Broda (2014) believe knowledge cannot be managed.

According to Sveiby (2001), humanistic researchers and scholars such as philosophers or psychologist tend to see knowledge as a complex set of dynamic skills, know-how and so on that is constantly changing. Sveiby (2001) explains that the tacit and know-how nature of knowledge

often defies its explicit nature and that knowledge cannot be managed. Hence, KM is a poor term, but we are stuck with it. Moreover, knowledge holders have limited control over their knowledge and that new knowledge can be gained through reason and experience. It is therefore hard or even impossible to forget knowledge, hence, no need of managing knowledge (Broda, 2014). It is even more difficult to manage the knowledge of another mind which could be done only indirectly by providing or inhibiting access to information channels or learning by experience (Kontzer, 2001). Miller (2002) opines that the tacit nature of knowledge makes it impossible to be managed since it resides in people. Hence, the notion that we can capture knowledge becomes ludicrous, just as ludicrous as the notion that we can capture people's thoughts.

Drucker (1969) and Wilson (2002) also scoff at the notion of KM. According to Wilson (2002), the difficulty of organising knowledge often makes it to be forgotten and can sometimes remerge when it is needed which results in us having "very little control over what we know". Similarly, Drucker (1969) expresses that, "knowledge cannot be managed since knowledge is between two ears and only between two ears". To that extent, it is really about what individuals do with the knowledge they have. When employees leave an organisation, their knowledge (experience, skills, know-how, etc.) goes with them, no matter how much they try to share them (Kontzer, 2001). Since knowledge cannot be managed, Nonaka (1994) suggests "Knowledge Focus" or "Knowledge Creation" are better terms, rather than KM, because they describe a mind-set, which sees knowledge as an activity not an object.

However, Mullins (1997), Zack (1999), Frost (2012) and KnowledgePoint (2014) are of the opinion that both tacit and explicit knowledge can be managed as organisational assets, objects and processes and as such will require a massive human effort (Mullins, 1997; Harold, 2012) and technologies to help capture, process, manage, store and disseminate knowledge (Frost, 2012). KnowledgePoint (2014) expresses that the management is an organisational function. Managing knowledge requires turning personal knowledge into corporate knowledge that can be widely shared throughout an organisation and appropriately applied. Thus, knowledge is increasingly being recognised as a crucial organisational resource that gives market leverage. Its management is therefore too important to be left to chance (Zack, 1999). KM therefore implies a strong tie between the management function, organisational goals and strategy and it involves the

management of knowledge that is useful for some purpose and which creates value for the organisation (Frost, 2012).

Very early in the KM movement, Davenport (1994) offered the still widely quoted definition for KM: the process of capturing, processing, sharing and effectively using knowledge. This definition has the virtue of being simple, stark and to the point. Davenport and Prusak (1998) also express that KM is concerned with the exploitation and development of the knowledge assets of an organisation with a view to furthering the organisation's objectives. Management entails all of those processes associated with the identification, sharing and creation of knowledge. This requires systems for the creation and maintenance of knowledge repositories and to cultivate and facilitate the sharing of knowledge.

Deloitte and Touch (2000), Ready (2007) and Kundu (2013) concurrently created another definition of KM, which is perhaps the most frequently cited one: KM is a discipline that promotes an integrated approach to identifying, capturing, evaluating, retrieving and sharing all of an organisation's information assets. These assets may include people, databases, documents, policies, procedures and previously uncaptured expertise and experience in individual workers.

There are also other definitions of KM that are concrete and have some connection with the previous ones. Examples are:

- The categories of knowledge needed to support the overall business strategy, assess the firm's current knowledge and transfer the knowledge base to be more powerful and to fill gaps (Gopal & Gagnon, 1995)
- The management discipline concerned with the systematic acquisition, creation, sharing and use of knowledge in organisations, aiming to improve a firm's competitiveness via continuous and rapid innovation (APQC, 2003)
- A process in general system theory with four categories, including knowledge acquisition and creation; knowledge capture, storage and retrieval; knowledge dissemination, transfer and sharing; and knowledge application that organisations decide to manage to gain competitive advantage (Kongpichayanond, 2009:382).

These definitions have some similarities. Spender and Scherer (2007) consider these similarities as the core components of KM which comprise: processes (the creation, capturing, storing, sharing and effective use of knowledge in an organisation); people (individuals and the roles they play in supporting KM process in the organisation); technology (the tools/infrastructure that an organisation uses to support KM processes); and culture (the norms/traditions of knowledge creation and sharing within an organisation).

Ramohlale (2014) asserts that the ultimate aim of KM is to organise, share and put together knowledge to create substance and value in knowledge, retain key talent, improve customer service, boost innovation, achieve business objectives faster and better and promote the development of unique market offerings. This is achieved through an integrated set of initiatives, systems and behavioural interventions to promote smooth flow and sharing of knowledge relevant to the business and to eliminate reinvention (Arun, 2005). Davenport and Prusak (1998) conclude that KM is to achieve four major objectives which include:

1. **To create knowledge repositories**, which store both knowledge and information, often in documentary form. These repositories can fall into three categories:
    1. Those that include external knowledge, such as competitive intelligence.
    2. Those that include structured internal knowledge, such as research reports and product-oriented marketing materials, such as techniques and methods.
    3. Those that embrace informal, internal or tacit knowledge, such as discussion databases that store "know-how".
2. **To improve knowledge access and transfer**. Here the emphasis is on connectivity, access and transfer. Technologies such as video-conferencing systems, document scanning and sharing tools and telecommunications networks are central.
3. **To enhance the knowledge environment** so that the environment is conductive to more effective knowledge creation, transfer and use. This involves:
    1. tackling organisational norms and values as they relate to knowledge
    2. Increasing awareness of sharing knowledge embedded in client relationships and engagements
    3. providing awards for contributions to the university's structured knowledge base

4. implementing decision audit programmes in order to assess whether and how staff are applying knowledge in key decisions
5. recognise that successful KM is dependent upon structures and cultures

4. **To manage knowledge as an asset** and to recognise the value of knowledge to an organisation.

## 2.5 Knowledge Management Systems

A broad range of perspectives, approaches, authors and schools on KM system discipline exists. Authors like Gupta and Sharma (2005), Ready (2007), Chandran and Kavitha (2009) and Frost (2014) view KM systems from the techno-centric perspective with emphasis on the technologies that drive knowledge creation and knowledge sharing. Others like Clutterbuck (2001), Young (2010), Frost (2014) and Craig (2014) explain KM systems from a non-technical perspective. In addition, Gallupe (2001) views KM systems from both the technical and non-technical perspective. There are other authors, known as the knowledge ecologist, such as Shrivastava (1998), Malhotra (2002), Bray (2007) and Okurowsk (2013) who explain KM systems from an organisational perspective by focusing on the interaction of people, identity, knowledge and environmental factors. Regardless of the perspective and school of thought, there are five core components of KM, which are people, processes, culture, technology and structure.

### 2.5.1 Knowledge Management from Organisational and Non-Technical Perspective

Organisations are constantly looking for a competitive advantage in an expanding and knowledge-intensive market place (Lucey, 2005). To this end, Figallo and Rhine (2002:30) reason that KM systems should be developed to position these organisations to achieve and gain a competitive advantage over their competitors. Figallo and Rhine (2002) express that KM systems are developed to meet two threatening challenges faced by large organisations that are seeking a competitive edge in an expanding and information-intensive marketplace. The first is to enable the organisation to work better with all the knowledge generated and shared in the organisation by establishing ways of taking control over the sources of the knowledge with the intention not to lose the created and captured knowledge. The other is to enable the organisation to use the knowledge to answer typical and complex business questions that they face and that arise based

on increasing competition in the fast-changing global economy. As a result, organisations are able to gather relevant data and construct them in a manner that informs the organisation on how to achieve their goals and objectives. The process begins with data collection, processing, storage, preservation, retrieval and dissemination. This KM system helps the organisation to structure and organise relevant knowledge for effective decision-making for a competitive advantage.

Bukowitz and Williams (1999) and Gupta and Sharma (2005) focus on KM systems by linking it directly to tactical and strategic requirements of the organisation. Its focus is on the use and enhancement of knowledge-based assets to enable the organisations to respond to these issues. In addition, Becker and Ghimire (2003) explain that knowledge is a complex adaptive system and its management requires flexibility and a capability to respond to environmental feedback. It consists of many sources, venues, forms and species of knowledge agents in a symbiotic relationship of productive exchange and value creation (Shrivastava, 1998; Gupta & Sharma, 2005). Malhotra (2002:2–3) explains that knowledge involves interactive and interdependent social, cultural (all of a firm's values and beliefs about knowledge), behavioural, work process (how people actually use knowledge and what they do with it) and political subsystems (the pitfalls that can interfere with knowledge sharing) that shapes the creation, flow and use of knowledge in the organisation.

To concretise this concept, Mikulecká and Mikulecký (2000), Petrides and Nodine (2003), Mikulecky and Lodhi (2009), Shattock (2010:7) and Pircher and Pausits (2011) explain that it can be explored in the context of business education and training. According to Shattock (2010:7), Pircher and Pausits (2011), KM represents the core work of organisations such as schools, colleges, universities, training consultants, corporate training programmes and so on. These organisations deal with the creation, interpretation, critique and distribution of knowledge within communities of scholars, practicing experts, trainers/teachers, learners and administrators. Historically, these tasks have been labour intensive with technologies (particularly information technologies) playing a secondary, albeit increasingly important role (Alavi & Leidner 1997; Frost 2014). With the advent of the digital economy, the balance of human and technological elements in KM in education and training is being destabilised. This is especially true in business education, because, in that context, both educational processes and content and business processes are being

transformed simultaneously by electronic (computers and telecommunications) technologies (Shrivastava, 1998; Shattock 2010:7; Pircher & Pausits, 2011).

Also from a non-technical perspective, KM systems are those systems that are human and organisational centred (Young, 2010). The focus is on how individuals and organisations can be equipped best to design and facilitate knowledge processes (Lucey, 2005). This includes cross-functional project teams and project specialists (experts) working together towards a common goal (Lucey, 2005; Frost, 2014); training (developing and imparting specific skills, knowledge and competence to someone) (Lucey, 2005); education (transferring knowledge, skills, values, beliefs and habits to individuals or groups of individuals through storytelling, discussion, teaching, training, or research) (Young, 2010; Frost, 2014); storytelling (transmission of events in words and images to individuals or groups of individuals, often by improvisation or embellishment); mentorship (Clutterbuck, 2001 and Frost, 2014); meetings (Akerkar & Vercouter, 2012; Frost, 2014); interactive sessions (Akerkar & Vercouter, 2012; Frost, 2014); and brainstorming (Young, 2010; Frost, 2014). The explanation given by Lucey (2005), Young (2010) and Frost (2011;2014) was essentially based on the fact that KM systems are fundamentally human centred and that it takes the human force to capture, process, store and disseminate knowledge.

### 2.5.3 Knowledge Management Systems from a Technological Perspective

Gupta and Sharma (2005) refer to these systems as IT-based tools. These technologies support and improve the management of knowledge, including processes such as knowledge creation, storage, retrieval, transfer and application (Alavi & Leidner, 2001:3). According to Ready (2007), these technological systems process and generate value from their intellectual and knowledge-based assets. Most often, generating value from such assets involves sharing them among employees, departments and even with other organisations in an effort to devise best practices (Alavi & Leidner, 2001:3; Anduvare, 2015). In other words, KM systems are repositories of knowledge from a collection of experts, organised in such a manner that it can be accessed easily (Chandran & Kavitha, 2009:158).

From Bali, et al., (2009), these technology-based tools include groupware systems and KM 2.0, the intranet and extranet, data warehousing, data mining, decision support systems, content

management systems, document management systems, artificial intelligence tools, simulation tools, semantic networks. Young (2010) also mentions the portal, profile, collaborative workspaces, urgent requests, document libraries, servers, databases, knowledge bases, blogs and advanced search tools.

## 2.6 Knowledge Management Processes

KM process is essential in modern and successful organisations that regard knowledge as a major success factor in competitiveness (Frost, 2014; Zaim, 2006:3). According to Sanchez and Palacios (2008), an effective organisational environment and the implementation of KM processes should increase the quality and quantity of both explicit and tacit knowledge of individuals, teams and the whole organisation. KM processes might be defined as the processes by which individuals, teams and organisational subsystems interact, acquire, create, store, share, retain and effectively use knowledge (Sanchez & Palacios, 2008).

A more comprehensive view of the constituent KM processes is provided by Zaim (2006) who argues that it is possible to compose a more comprehensive process-oriented view of KM. He states, "KM is the systematic management of all activities and processes referred to generation and development, codification and storage, transferring and sharing and utilisation of knowledge for an organisation's competitive edge" (Zaim, 2006:3). The process-oriented definition of KM was also emphasised by Jashapara (2004) who revealed that KM involves any practice or process of acquiring, creating, sharing, capturing and using knowledge, wherever it resides, to enhance organisations learning and performance. Supyuenyong and Islam (2006:1212) and King (2009:4) indicate that KM processes consist of identification, acquisition, preparation, dissemination, usage and, finally, maintenance. Its goal is to leverage and improve the organisation's knowledge assets to effectuate better knowledge practices, improved organisational behaviours, better decisions and improved organisational performance (King, 2009:4).

Singh (2007:177–178) and King (2009:4) further state that, although individuals in the organisation can, undoubtedly, personally perform each of the KM processes, KM is generally an organisational activity that emphasises what managers and information professionals can do to

enable KM's goals to be achieved, how they can motivate individuals to participate in achieving them and how they can create social processes that will facilitate KM success.

### 2.6.1 Knowledge Acquisition

Feliciano (2007) describes knowledge acquisition as the process of extracting knowledge from experts and structuring this knowledge in a readable form. Frost (2014) also stipulates that knowledge acquisition is the process of developing and obtaining insights, skills and relationships either from internal or from external sources. The external sources include best practices and benchmarking information from other organisations; attending conferences; hiring consultants; monitoring economic, social and technological trends; collecting data from customers; competitors and resources; hiring new staff; collaborating with other organisations; building alliances; forming joint ventures and establishing knowledge links with business partners. At the same time, organisations acquire knowledge internally by tapping into the knowledge of its staff, learning from experiences and implementing continuous process improvements (Nemani, 2010).

Nemani (2010) further expresses that knowledge acquisition has three main roles: to codify explicit knowledge; convert tacit knowledge into an explicit form and codify it; and to acquire tacit knowledge as explicit meta-knowledge (knowledge about knowledge). This is generally a directory of "who knows what" and how to contact them and the value of knowledge content. The value of knowledge content is derived from its potential benefit for a recipient and this requires interaction between a recipient and a source (Desouza & Awazu, 2006; Ford & Staples, 2006). According to Nemani (2010) and Davenport and Prusak (1998), the purpose of the codification of knowledge is to make the knowledge easy to organise, locate, share, store and use in organisation. Nemani (2010) further states that all codified materials only exist within organisations memory. Therefore, in order to overcome this deficiency, organisations need to use the information technologies to acquire and share knowledge.

In universities, Anduvare (2015) and Boateng and Agyemang (2014:587) state that trust, willingness, openness, communication and collaboration predict successful knowledge acquisition. Since willingness is vital for knowledge acquisition and sharing, various motivation drivers are studied by researchers. On the source side, three sets of motivation drivers are

described. The first set includes individual factors, i.e. attitude towards knowledge sharing, cost and benefit from knowledge sharing. The second set comprises contextual factors such as subjective norms and organisational climate. The third set is the knowledge factor, that is perceived value of knowledge (Bock, Zmud, Kim and Lee, 2005; Kankanhalli, Tan & Wei, 2005; Wasko & Faraj, 2005; Ford & Staples, 2006).

### 2.6.2 Knowledge Creation

The ability to create new knowledge is often at the heart of organisations competitive advantage (Frost, 2014). Voelpel, Von Pierer and Streb (2006:8) express that knowledge creation is the process of making available and amplifying knowledge produced or generated by individuals or groups as well as crystallising and connecting it to an organisation's database or system. In other words, anything individuals or groups come to know in their life benefits their colleagues and, eventually, the larger organisation. Burgoyne and Reynolds (1997) and Nemani (2010) express that knowledge creation consists of two different paradigms. These are the scientific paradigm and social paradigm. The scientific paradigm is considered as a canonical body of facts and rational laws, while in the social paradigm, knowledge is socially constructed through employee interchange. This leads to the creation of new knowledge, which requires the participation of all the employees and leadership of the organisation (Nonaka, 1994; Nemani, 2010).

There are different knowledge creation models. Knowledge creation according to the Nonaka's SECI model is about the continuous transfer, combination and conversion of the different types of knowledge (tacit and explicit), as users practice, interact and learn. Nonaka's SECI model introduced four patterns of knowledge creation in an organisation: socialisation (tacit knowledge created from tacit knowledge), externalisation (explicit knowledge created from tacit knowledge), combination (explicit knowledge created from explicit knowledge) and internalisation (tacit knowledge created from explicit knowledge). The SECI model's essential assumption is that the tacit knowledge in the organisation can be converted to explicit knowledge (Nonaka & Takeuchi, 1995:2).

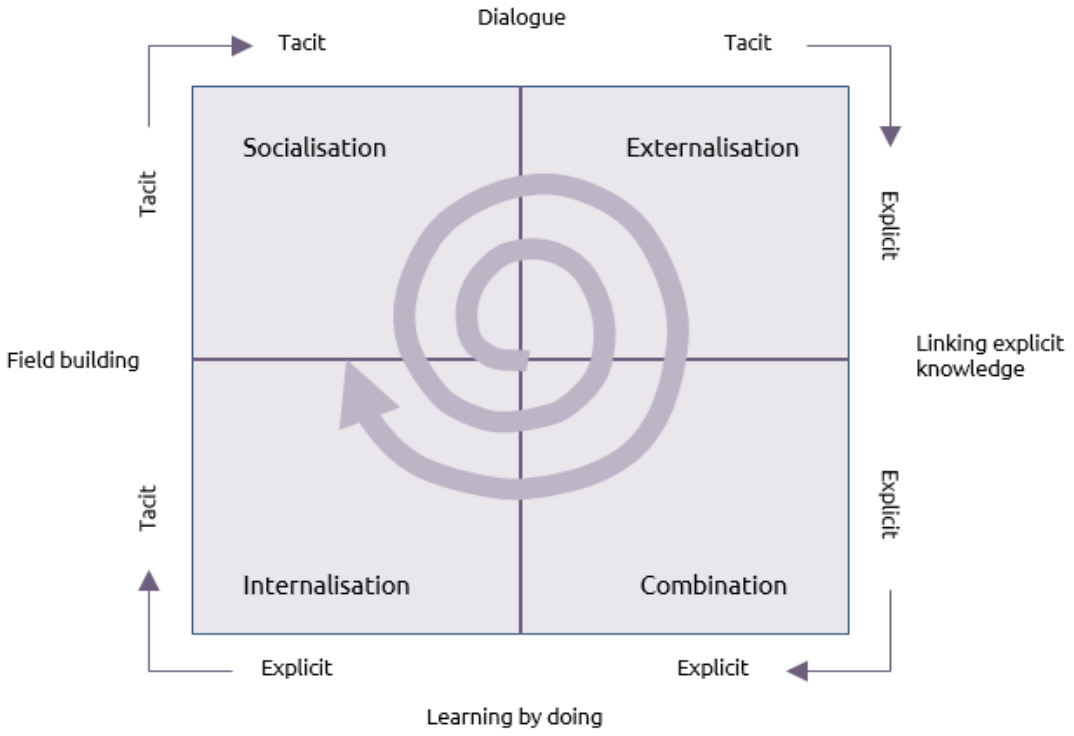


**Figure 2.1: The SECI KM model**

Source: Nonaka & Takeuchi, 1999:72

#### 2.6.2.1 Socialisation: Tacit-to-Tacit

Socialisation is a tacit-to-tacit knowledge experience whereby knowledge transfer and sharing take place by means of face-to-face meetings or through experiences (Gourlay, 2006). According to Harsh (2009), Nold (2009) and Frost (2014), socialisation defines a setting where individuals or groups of individuals in an organisation share personal experiences, values and beliefs, perspectives, know-how and tacit knowledge through direct interaction. During socialisation, individuals share experiences, thereby creating tacit knowledge such as mental models and technical skills. Employees in every organisation keep sharing their experiences and skills, mental models, beliefs and perspectives on a regular basis. The tacit knowledge from experienced and senior employees is shared with junior members during socialisation and vice versa. When employees leave (retire or resign) an organisation, knowledge can still be extracted from and located in other employees through various attrition methods. As explained by Nonaka and Takeuchi (1995:63), apprentices work, learn craftsmanship and acquire skills and expertise from their masters not through language, but through observation, imitation and practice.

From a university perspective, group interactions, lectures, workshops, seminars, meetings and conferences are common platforms where tacit knowledge, experience, skills, know-how and so on are shared among members (Anduvare, 2015). Since tacit knowledge is difficult to formalise and is often time and space specific, it can only be acquired through shared experience, such as spending time together or living in the same environment. Socialisation typically occurs in traditional apprenticeship, where apprentices learn the tacit knowledge needed in their craft through hands-on experience, rather than from written manuals or textbooks (Nonaka & Takeuchi, 2000:9; Frost, 2014)

#### 2.6.2.2 Externalisation: Tacit to Explicit

According to Nonaka and Takeuchi (1995:64; 2000:10), externalisation is the publishing and articulation of tacit knowledge into explicit concepts. Nold (2009) and Frost (2014) also expresses that externalisation describes a process whereby tacit knowledge of an individual is converted into a concept or form that is capable of being transmitted (shared). It is shared through the creation of procedures, mailing systems and any other media that transmit knowledge to a broader sphere. When tacit knowledge is made explicit, the tacit knowledge is crystallised into explicit knowledge, thus permitting it to be shared with others and it becomes the basis of new knowledge (Gourlay, 2003; Dalkir, 2011:68). Externalisation takes the shape of metaphors, analogies, concepts, hypotheses, or models (Nonaka & Takeuchi, 1995:64).

Examples of externalising knowledge in the university could include teaching, publications (journals, textbooks, conference papers, etc.), presentations and so on. This ensures that tacit (expert) knowledge is codified into explicit knowledge to be easily shareable with other staff (teaching and non-teaching) and in this way, students allow knowledge to remain in the university even if the experienced person leaves (retire or resign) the university (Mikulecká & Mikulecký, 2000; Anduvare, 2015). Codified knowledge is easily stored on computers and in other forms, so knowledge is preserved and retained in the organisation (Frost, 2014).

#### 2.6.2.3 Combination: Explicit to Explicit

This involves the combination (organising) of different types of explicit knowledge (Gourlay, 2003; Dalkir, 2011:68). According to Nold (2009) and Jain (2011), it describes the process whereby individuals or groups share knowledge with others outside the immediate domain of personal contact through some common media. Nonaka and Takeuchi (1995:67) state that "combination is a process of systematising concepts into a knowledge system". The use of telecommunication systems and databases can support this mode of knowledge conversion. For example, in the university environment, explicit knowledge is gathered (either inside or outside) from systems and databases in the universities. This is then edited or processed to form new knowledge. The new explicit knowledge is then disseminated among the members of the universities (Mikulecká & Mikulecký, 2000).

#### 2.6.2.4 Internalisation: Explicit to Tacit

Gourlay (2003) and Dalkir (2011:68) are of the opinion that internalisation is the process of continuous individual and group reflection and the ability to see connections and recognise patterns and the capacity to make sense between fields, ideas and concepts. This is knowledge received and applied by individuals or groups (Gourlay, 2003). It embodies converting explicit knowledge into tacit knowledge. That is, individuals or groups process and merge newly received knowledge with their own from internal and external sources to create a completely new set of knowledge (Nold, 2009). Whenever individuals exchange tacit and explicit knowledge, knowledge transfer and retention occurs (Jennex, 2007; Dalkir, 2011:68).

According to Nonaka and Takeuchi (1995) experiences acquired through socialisation, externalisation and combination can become valuable assets once they are internalised into the individuals' tacit knowledge bases through shared mental models or technical know-how. Jennex (2007) expresses that individuals internalise and enrich their tacit knowledge through documentation or use of manuals. Nonaka and Takeuchi's (1995) SECI KM strategy shows that knowledge can be transferred from one individual to another and from an individual to databases (repository) through knowledge conversion. Therefore, this retains knowledge in the organisation and prevents loss of knowledge by sharing it with colleagues.

### 2.6.3 Knowledge Retention

According to Kirsch (2008), knowledge retention is the act of focusing on the critical knowledge that is at risk of being lost, prioritising what is at risk based on potential knowledge gaps and their impact upon overall organisational performance and then developing actionable plans to retain that knowledge. Kim (2005) further indicates that knowledge retention is all the activities, databases and repositories that capture, preserve and archive knowledge of organisations. In the opinion of Walsh and Ungson (1991) and Frost (2014), knowledge can exist or be retained in repositories of organisations and this knowledge repositories mainly consist of individuals, culture, transformations (procedures and formalised systems), structures (formal and informal networks) and external activities.

The most effective approach to retain this wealth of intangible assets (experts knowledge) in universities is by implementing strategies such as education, training, communities of practice and professional networks, documenting the processes and use of advanced technology to capture work processes (Wamundila & Ngulube, 2011; APQC, 2015), mentoring and apprenticeship, greater access to subject matter experts, storytelling and leveraging retirees (Chigada, 2014:58–59; Frost, 2014). Other strategies include support of formal and informal knowledge networks (social areas, social media, meetings, company functions, knowledge fairs, expertise locator, etc.), changing the organisation culture (Frost, 2014; APQC, 2015). Lahaie (2005) and Liebowitz, (2011) state that knowledge could be retained by implementing reward structures to encourage sharing of key knowledge; project teams and cross-functional project teams; after-action reviews; storytelling; and job shadowing; interviews and exit interviews; job rotation; company procedures/processes manuals and taking advantage of the knowledge of retirees and succession planning.

However, some organisations have a broader view of knowledge retention by focusing on the relationship with employees and management. This view does not separate organisational knowledge from employees; rather it recognises that organisational knowledge is most valuable when all employees possess it, share it and use it together to further business objectives (Frost, 2014). As long as employees stay in employment at the universities, they continue to play a competitive role through effective decision-making, communication and contribution. In the absence of knowledge-retention strategies, organisations lose tacit knowledge when employees

leave for other organisations and due to other forms of attrition. Once employees leave the organisation, their knowledge is also gone. A study by Wamundila and Ngulube (2011) on knowledge retention at the University of Zambia (UNZA) revealed that retirements (58.9%), resignations (64%) and deaths (58.9%) are the major factors that pose as challenges to knowledge retention.

### 2.6.4 Knowledge Sharing

Knowledge sharing has different meanings for different researchers and scholars. Jonsson (2008:39) points out that within the frame of reference, both "knowledge sharing" and "knowledge transfer" are used and discussed interchangeably. Knowledge sharing and knowledge transfer are used interchangeably to mean the same thing in this study as suggested by Jonsson (2008:39).

Knowledge sharing is part of the KM processes of an organisation and the operational objective of KM is to ensure that the right knowledge is available to the right person/people at the right time for performing their knowledge activities (Ramohlale, 2014). A broader definition is the process through which one unit is affected by the experience of another and is manifested through changes in the knowledge or performance of the recipient units and can be demonstrated by measuring changes in performance (Argote & Ingram, 2000) and enabling the exploitation and application of existing knowledge for the organisation's purposes (Kumar & Ganesh, 2009).

Knowledge sharing enables organisations to re-create a complex, causally ambiguous set of routines and knowledge in new settings, keep it functioning and facilitate learning (Frost, 2014). In organisations, learning involves the transfer and sharing of knowledge among different organisational units (Argote & Ingram, 2000; Frost, 2014). Such knowledge transfer occurs in a mutual social context in which different units are interconnected to one another (Argote & Ingram, 2000; Tsai, 2001). Knowledge transfer among the units of organisation provides opportunities for mutual learning and inter-unit cooperation that stimulate the creation of new knowledge and, at the same time, contribute to organisational units' ability to innovate (Argote & Ingram, 2000).

According to Nonaka (1991), knowledge sharing in organisations involves individual project team members sharing knowledge through socialisation such as imitation, observation and copying as

espoused. In a study conducted by Staplehurst and Ragsdell (2010) on knowledge sharing activities of two small and medium-sized companies in the United Kingdom (UK), revealed that employees preferred sharing facilities such as meeting rooms and desks, as well as sharing knowledge outside of the office during work time. Sharing knowledge in meetings provides a free environment where members make contributions. Also, a study conducted by Ramohlale (2014:48) on KM's role in organisational performance in South Africa Banks revealed that both Nedbank and FNB employees like sharing knowledge outside of the office during tea breaks. Knowledge can also be shared during seminars, conferences, team-building exercises, written reports, performance appraisals and conventional employee suggestion programmes (Ramohlale, 2014:48).

However, knowledge sharing can encounter challenges such as lack of time, experience and visible rewards for sharing knowledge, protecting one's competitive edge, job insecurity, personal animosity and personal traits, shared knowledge not being accepted or comprehended (Oye, Mazleena & Noorminshah, 2011:80; Ramohlale, 2014:48). Oye, et al. (2011:80), therefore, conclude that knowledge workers possess a great deal of valuable knowledge, explicit as well as tacit. However, knowledge sharing is the basis of knowledge work and, therefore, ironically, knowledge workers are constantly required to devalue themselves by sharing valuable knowledge. To remain viable in the knowledge workplace, knowledge workers have to replenish their stock of valuable knowledge constantly. Therefore, knowledge will only be shared with those who could offer other valuable knowledge in turn (Oye, et al., 2011:80).

## 2.7 Knowledge Management Enablers: Critical Success Factors

In order for knowledge to be created and shared in organisations, the organisations need to undertake different actions, depending on the available means and characteristics of the specific situation (Gaijic & Riboni, 2010:20). Many factors contribute to the success or otherwise of a KM initiative in organisations (Hasanali, 2002). The concept of critical success factors (CSF) of KM in organisations implies that a number of factors exist in each branch and area that absolutely determine the success of organisation (Sedighi & Zand, 2010; Chigada, 2014). If the CSF could be determined, an important step would have been taken in the direction of a generally relevant validation of KM.

Researchers have tried to define different CSFs that may help in KM. Lee and Choi (2003) distinguish between social and technical CSFs. They argue that the social CSFs are culture, organisational structure and human factor, while the technical CSFs are related to information technology. Results of a Delphi study synthesise a comprehensive range of CSFs. The study identified factors in literature that influence KM initiatives. The factors and their sources in literature have been identified as: culture, leadership, technology, structure (Arthur et al., 1996; Frost, 2014), organisational adjustments (Van der Spek & Spijkervet, 1997), evaluation of KM activities and/or knowledge resources, governing/administering knowledge activities and/or knowledge resources (Wiig, 1993; Leonard-Barton, 1995; Van der Spek & Spijkervet, 1997), employee motivation (Szulanski, 1999; Van der Spek & Spijkervet, 1997) and external factors (Van der Spek & Spijkervet, 1997), managerial influences, resource influences, environmental influences (Holsapple and Joshi, 2002:239), business processes, human processes (Mathi, 2004). A summary of these influence factors by author is presented in the table below.

**Table 2.1: Summary of KM CSF**

| **Author** | **Influences on conduct of knowledge management** |
|---|---|
| Leonard-Barton, 1995 | 1. Managerial system (e.g. education, reward and incentive systems)<br>2. Values and norms (e.g. system of cast and status, rituals of behaviours, passionate belief |
| Arthur, Andersen and APQC, 1996; Frost, 2015 | 1. Culture<br>2. Leadership<br>3. Technology<br>4. Strategy |
| Wiig, 1993 | 1. Exploring knowledge and its adequacy (survey & categorise knowledge analyse knowledge & related activities, elicit, codify & organise knowledge)<br>2. Assessing value of knowledge (appraise & evaluate knowledge and related activities) |

| | |
|---|---|
| | 3. Managing knowledge activity (synthesise knowledge related activities; handle, use, and control knowledge, leverage, distribute, automate knowledge) |
| Van der Spek and Spijkervet, 1997 | 1. Conceptualise (gain insights about the conduct of KM)<br>2. Reflect (access qualities and plan improvements)<br>3. Retrospect (evaluating the performance of the knowledge manipulation activities and the result from those activities<br>4. Internal developments (culture, employee motivation, organisational adjustments, management, technology)<br>5. External developments<br><br>(Items 1, 2 and 3 guide the structuring of knowledge manipulation activities) |
| Szulanski, 1996 | 1. Characteristics of knowledge transfer (include causal ambiguity and unprovenness)<br>2. Characteristics of knowledge source (include lack of motivation, perceived unreliability)<br>3. Characteristics of knowledge recipient (include lack of motivation, absorptive and retentive capacity)<br>4. Characteristics of the context (include barren organisational context and arduous relationship) |
| Holsapple and Joshi, 2002 | 1. Managerial influences<br>2. Resource influences<br>3. Environmental influences |
| Mathi, 2004 | 1. Business processes<br>2. Human processes |
| Anduvary, 2014;<br>Margilaj and Bello, 2015 | 1. Measurement<br>2. Assessment |

### 2.7.1 Culture

Culture is an imperative factor for successfully implementing KM (Sedighi & Zand, 2010). It comprises a set of common values, beliefs and norms which are shared by all members of some social unit, such as organisations (Milovanović, 2011). Generally, a supportive culture of KM in organisations is what highly promotes and encourages knowledge creation, sharing and application (Milovanović, 2011). Wong (2005:267) also supports this accession and states that a culture that is supportive of KM is one that highly values knowledge and encourages its creation, sharing and application. The culture of KM in Ghanaian Universities such as UG, UPSA and GTUC may even be much broader and easier since the culture of knowledge creation and sharing is the norm and normal among them.

Mustaq and Bokhari (2011) explored the impact of organisational culture and their results showed that organisational culture had an influence on KM. These findings support Staplehurst and Ragsdell (2009), Sedighi and Zand (2010) and Chidada (2014) who found that culture is a KM facilitator. Jacobs and Roodt (2007) also investigated the relationships between organisational cultures, knowledge sharing and turnover intentions. Their findings revealed a positive correlation between organisational culture and knowledge sharing: nurses would share knowledge if they perceived desirable outcomes of their efforts. Schoorman, Mayer and Davis (2007) and Albers (2009) also assert that trust, openness, teamwork and collaboration, risk-taking, tolerance for mistakes, autonomy, common language, courage and time for learning are significant aspects of KM culture. Therefore, without a high level of mutual trust among members of the organisation, people would be very sceptical about the intentions and behaviour of others towards them and would not be willing to share knowledge among themselves freely.

### 2.7.2 Leadership

Hasanali (2002) and Chigada (2014) state that leadership plays a key influential role in the success factor in KM in almost any initiative in an organisation. Leadership in organisations mean that the managers develop strategies to survive and position them for success in today's dynamic environment (Mathi, 2004). In essence, leaders institute and create the required conditions for the effectiveness of KM (Chigada 2014; Holsapple & Joshi, 2000). Due to this, Hasanali (2002) advocates that leaders, especially senior managers, are required to support and commit themselves

to the successful implementation of KM initiatives in the organisation. They should also be willing to create and share knowledge with others in the organisation. In the process of doing so, they will be able to naturally influence other staff to support KM initiatives in the organisation (Holsapple & Joshi, 2000:241).

Anduvare (2015) and Holsapple and Joshi (2000:241) further express that the distinctive characteristic of leadership in an organisation is that of being a catalyst through such traits as mentoring, coaching, motivation, inspiring, setting examples, goal setting, engendering trust and respect, listening, learning, teaching, instilling a cohesive and creative culture and knowledge sharing. The KM leader in the organisation creates conditions that permit participants to freely exercise and cultivate their knowledge creation and manipulation skills, to contribute their own individual knowledge resources to the organisation's pool of knowledge and have easy access to relevant knowledge resources (Bartczak, 2002).

For KM to be successful in an organisation, Bartczak (2002:33) and Chigada (2014) advocate that there must be KM leaders at all levels of the organisation. Although the most visible leader may be the knowledge manager or chief knowledge officer (CKO) or an equivalent position the "team of managers or officers who understand knowledge/KM and its uses in various aspects of the organisation, the motivational and attitudinal factors necessary to get people to create, share and use knowledge effectively and the ways to use technology to enhance knowledge activities" (Grover & Davenport, 2001:10) are equally important. The CKO has the routine task of managing and safeguarding knowledge and ensuring that everyone in the organisation shares information and knowledge and values knowledge as critical to their business strategies (Chigada, 2014:53).

Jones, Herschel and Moesel (2003:50), Anand, Manz and Glick (1998:796) and APQC (2013) consider the knowledge champions as change agents: individuals who influence clients' innovation decisions in a direction deemed desirable by the change agency. The leader of the team of knowledge champions is the CKO who is a member of the senior management of the organisation (Jones, et al., 2003:50). Driven by the need to better capture, process, retain and share knowledge, Davenport and Prusak (1998) suggest that organisations need a CKO whose functions are to:

- advocate knowledge discovery and use

- design, implement and oversee organisation(s) knowledge infrastructure such as its libraries; information, research and knowledge bases/centres; and human and computer knowledge networks
- manage relationships with external information and knowledge providers and negotiate contracts with them
- provide critical input to knowledge creation and application in the organisation,
- design and implement the knowledge codification process of the organisation
- measure and manage the value of knowledge in the organisation, either by conventional financial analysis or by anecdotal management
- manage the organisation's professional knowledge managers, giving them a sense of community, establishing professional standards and managing their careers
- lead the development of knowledge strategy, focusing the organisation's resources on the types of knowledge it needs to manage most and the current knowledge processes with the largest gaps between need and current capability

### 2.7.3 Strategy and Purpose

One of the major means for driving KM initiatives and the success factors of KM is to have a clear and well-planned strategy (Liebowitz, 1999a; Chigada, 2014). When organisations clearly outline the KM strategy, it then provides the foundation for how the organisation can easily deploy its capabilities and resources to enable it to achieve its goals (Chigada, 2014). As a result, Creech (2005) expresses that KM systems should be developed based on the organisation's strategic plan and should also be tied directly to organisational operations. Best practice recommends that doing so aids in establishing a consistent picture within the organisation, as well as to create KM practices that are consistent with the culture of the organisation (Chigada, 2014). The KM strategy must be linked to the business strategy of the organisation (Tiwana, 2008). Saint-Onge (2002) further states that a KM strategy provides the framework within which an organisation manages new initiatives aimed at leveraging the intangible assets of the organisation. Thus, the KM strategy should not be managed parallel with the business strategy, but should be an integral part of the business strategy (Snyman & Kruger, 2004).

### 2.7.4 Information Technology Infrastructure

Without a solid IT infrastructure, it is practically difficult for members of an organisation to share knowledge on a large scale (Skyrme, 2011). The IT infrastructure to support KM initiatives in organisations includes hardware, software application and having a platform to share knowledge (Hasanali, 2002; Frost, 2015). Chigada (2014) is therefore of the view that important factors to be considered in the development of KM systems in organisations should include the simplicity of technology, ease of use, adaptability to the needs of the user, connection with knowledge content and standardisation of a knowledge structure. There are various technological tools that can support KM in universities (Ntumy-Coleman, 2011).

Chigada (2014) argue that since IT is a crucial enabler in the implementation of an effective KM system in organisations, management needs to cultivate a culture of learning, enthusiasm and innovation. However, Nahapiet and Ghoshal (1999) express that a mere implementation of technologies to support KM in an organisation does not necessarily translate into effectiveness, efficiencies and productivity. In this regard, Frost (2015) indicates that the technologies must be accessible and useable.

An investigation into how ICT was used by three broadcasting corporations as tools and enablers of knowledge acquisition and retention by Dewah (2011) indicates that technology, such as collaborative computing tools, electronic document management systems, knowledge servers, knowledge harvesting tools and search engines, enterprise knowledge portals, is critical enablers of KM. In addition, Gold, Malhotra and Segars (2001:188) indicate that collaboration and distributed learning technologies allow individuals in the organisation to collaborate. For organisations seeking to manage their knowledge better, Quintas (2004:38) states that the use of ICTs should be focused on connectivity and should provide communication systems that link humans together. The pace at which new technologies are coming into the market brings new types of issues and challenges; therefore, management is also encouraged to adapt to these new technologies as a way of retaining knowledge in the organisation.

## 2.8 Knowledge Management Strategies

All organisations need a systematic strategy (Lucey, 2005:157) that clearly outlines the goals and objectives of the organisation and a broad plan to help employees share knowledge (US Department of Health and Human Sciences, 2012). As Warner (2011) states, strategy is closely associated with an organisation's overall objectives and usually starts by revisiting the organisation's vision and mission and the associated strategic and business plans.

According to Lucey (2005:157), KM strategy is simply a blueprint that describes how an organisation will manage its knowledge resources/assets better for the benefit of the organisation and its stakeholders. It describes the systematic approaches (methodologies and tools) an organisation wishes to follow in the management of its knowledge assets (Shannak et al., 2013:146). Its focus is on building an organisation based all-inclusive, enterprise-wide KM programme. At the end thereof, it defines the business case, develops a future state model, pinpoints the most significant strategic recommendations from experts in the field and creates a roadmap for implementing all these processes (Kane, 2014). This ensures that the KM implementation process in organisations proceeds in a way that is aligned with its current business approaches, targeted at the right problems and coordinated with other existing change initiatives (Knoco, 2008). In addition, it helps to identify the performance gap between the current workflow and the optimal workflow required to achieve strategic objectives (Warner, 2011).

Furthermore, KM strategy is essential if organisations want to maintain a coherent and aligned KM practice, that is, the ability to create closer ties and better understanding between KM and business (Kane, 2014). Like every business strategy, a KM strategy must address the key business needs and issues (Knoco, 2014). Tissayakorn and Song (2013) express that for an organisation to be successful, its KM strategy must do more than just outline goals. The organisation needs to focus strongly on the needs analysis activities with staff to drive a primary strategy, such as identifying the key staff groups within the organisation (these groups deliver the greatest business value, or are involved in the most important business activities) and conducting comprehensive and holistic needs analysis activities with selected staff groups, to identify key needs and issues (Tissayakorn & Song 2013; Knoco, 2014).

There are different strategies for managing and safeguarding knowledge in organisations. These include: e-learning (Itmazi, 2011); communities of practice (Denning, 2015; mentorship and apprenticeship (APQC, 2015); coaching; and storytelling (Anduvare, 2015).

### 2.8.1 Electronic Learning (e-learning)

E-learning is the use of electronic media and ICT in education to facilitate knowledge sharing (Diana, 2004). It uses the internet technologies to deliver a broad array of solutions that enhance knowledge and performance (Ruiz, Mintzer & Leipzing, 2006). Similarly, Itmazi (2011) asserts that e-learning is the use of new multimedia technologies and the internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration. In the view of IEDHE (2012), e-learning is education and knowledge sharing based on modern methods of communication, including the use of computers and its networks, various audio-visual materials, search engines, electronic libraries and websites, whether accomplished in the classroom or at a distance.

Ruiz, et al. (2006) express that this type of education is delivered through the medium of the World Wide Web where the educational institution makes its programmes and materials available on a special website in such a manner that students are able to make use of them and interact with them with ease through closed or shared networks or the internet and through the use of e-mail and online discussion groups. The learning process needs techniques and tools to present the knowledge (from different resources), interact with it and share it with others. This tool has the potential to enhance and support the traditional learning system and make it more accessible and the content/knowledge shareable. Browaeys (2006) concludes that e-learning is an umbrella term that covers learning and knowledge sharing almost anytime, anywhere (asynchronous) on a computer, usually connected to a network to promote higher thinking and KM.

It is the opinion of Lwoga (2012) that e-learning mainly consists of five characteristics. These are as follows:

1. Learning takes place anytime and anywhere, not only in the classroom.
2. Learners take on the role of organisers. Instructors serve as both the distributors of educational content and facilitators of learning process.

3. Learning is a lifelong process and thus it is not linked solely to educational institutions.
4. Learning takes place in communities of learning or communities of practice, learners participate in formal as well as informal communities.
5. Learning is informal and non-formal takes place at home, at the work place and during leisure time and is no longer centred on teachers or institutions.

In promoting higher-order thinking and KM through technology-based learning environments, Ally (2004) advocates that the implementation of instructional strategies, which promote learners to make connections with new information to old, acquire meaningful knowledge and employ metacognitive thinking skills, are required within the e-learning environment. This requires an analysis of the learner; the learning context; the learners' specific learning needs; and the learning system. According to Siragusa (2007), e-learning systems consist of the learner (student) and instructor (lecturer).

#### 2.8.1.1 Types of E-learning

Ruiz, et al. (2006) and Ntumy-Coleman (2011:28–29) outline that e-learning is broadly inclusive of all forms of educational technology in learning and teaching and it is synonymous with other terminologies such multimedia learning, technology-enhanced learning, computer-based instruction, computer-based training, computer-assisted instruction or computer-aided instruction, internet-based training, web-based training, online education, virtual education, virtual learning environment, m-learning, digital educational collaboration, distributed learning and learning from a CD-ROM. Ntumy-Coleman (2011:29) notes that these different synonyms express and mean the same thing.

However, Ruiz, et al. (2006) draw attention to the fact that there are differences among all the synonyms used for e-learning. Ruiz, et al. (2006) note that some of these tools involve just the use and application of computers to facilitate teaching and learning in a localised environment, whereas others involve the networking and application of the internet facilities to aid knowledge sharing and learning. Furthermore, these alternative names emphasise a particular aspect, component or delivery method of e-learning. For instance, some are web-based learning, computer-based learning, virtual classrooms and digital collaboration, use of audio or video

recording, satellite or land-based broadcasts, CD-ROM, DVD, videoconferencing and even the telephone system. One of the key features of modern web-based learning environments is the capacity for users to learn remotely, from a different geographical area. Therefore, they considered them as types of e-learning to some extent.

Hrastinski (2008), Lado (2008), Kumar (2013) Omeruo (2013), Moturi (2013) and CourseMrchant (2013), again reveal that e-learning can either be synchronous, asynchronous, database e-learning, classroom 2.0, e-learning 2.0, collaborative learning, linear learning, learning management system and computer-aided assessment. In addition, there are several aspects to describing the intellectual and technical development of e-learning, which can be categorised into four discrete areas. These are:

- e-learning as an educational approach or tool that supports traditional subjects
- e-learning as a technological medium that assists in the communication of knowledge and its development and exchange
- e-learning as an educational subject, such as computer or information science
- e-learning as administrative tools such as education management information systems

### 2.8.2 Communities of Practice

A major means of facilitating and fostering effective KM practices in universities is through the establishment of CoPs. The phenomenon of CoPs is known under different names. In the World Bank, they are called “Thematic Groups”; in Hewlett Packard they are "Learning Communities" or "Learning Networks"; in Chevron they are called "Best Practice Teams" and in Xerox they are known as "Family Groups" (Denning, 2009).

The term CoPs was first used in 1991 by theorists Jean Lave and Etienne Wenger who discussed the notion of legitimate peripheral participation. It served as the basis of a social theory of learning and KM (Wenger, 2013). Lave and Wenger (1991:98), Denning (2009) and Wenger (2015) explain that CoPs are basically formed by people who engage in a process of collective learning in a shared domain of human endeavour: a tribe learning to survive, a band of artists seeking new forms of expression, a group of engineers working on similar problems, a clique of pupils defining their identity in the school, a network of surgeons exploring novel techniques, a gathering of first-time

managers helping each other cope. Such communities are typically based on the affinity created by common interests or experience, where practitioners face a common set of problems in a particular knowledge area and have an interest in finding, or improving the effectiveness of solutions to those problems (Denning, 2009). Their emergence may be spontaneous and they are held together by informal relationships and common purpose, they share common knowledge or a specific domain, expertise and tools and learn from one another (VanWyk, 2005:92). They possess knowledge, which is crucial to the success of the organisations (Sundrock, 2006:1).

Hinton (2003) is of the view that CoPs can exist wherever there is a will to create and share knowledge and experiences in a helpful and like-minded community. From Denning (2009), the group can evolve naturally because of the members' common interest in a particular domain or area, or it can be created specifically with the goal of gaining knowledge related to their field. It is through the process of sharing information and experiences with the group that the members learn from each other and have an opportunity to develop themselves personally and professionally (Lave & Wenger, 1991; Wenger, 2000). Hinton (2003) again posits that participation in the network is interactive and essential and this can help foster relationships and trust within a group. Furthermore, Hinton (2003) says that CoPs can be virtual in the sense that members may not physically work in the same location. Members do not even have to be part of the organisation. Thus, CoPs can be established by like-minded individuals like librarians and information/knowledge professionals inside or outside the university set-up/environment. They are set up for a purpose and to achieve certain objectives.

According to Nickols (2012), the purpose of all CoPs and the results expected from it largely depend on the issue, process, or practice area around which it is organised and upon which it is focused. Furthermore, the generally expected outcomes for all CoPs are to stimulate interaction, foster learning, create new knowledge, socialise new members and identify and share best practices (Nickols, 2012); address key strategic themes and validate knowledge assets (Sundrock, 2006:1); and accelerate the sharing and flow of knowledge and expertise (VanWyk, 2006). McDonald and Star (2008) are of the view that CoPs are ideally set up for academics to share and to develop their expertise, all within a supportive and safe environment.

Soren, *et al*. (2005) also state that CoPs are set up to achieve eight goals. These are: connect people who might not otherwise have the opportunity to interact, either frequently or at all; provide a shared context for people to communicate and share information, stories and personal experiences in a way that builds understanding and insight; enable dialogue between people who come together to explore new possibilities, solve challenging problems and create new, mutually beneficial opportunities; stimulate learning by serving as a vehicle for authentic communication, mentoring, coaching and self-reflection; capture and diffuse existing knowledge to help people improve their practice by providing a forum to identify solutions to common problems and a process to collect and evaluate best practices; introduce collaborative processes to groups and organisations as well as between organisations to encourage the free flow of ideas and exchange of information; help people organize around purposeful actions that deliver tangible results; and generate new knowledge to help people transform their practice to accommodate changes in needs and technologies.

#### 2.8.2.1 Communities of Practice Systems

There are many technologies (tools) that facilitate CoPs in universities. These tools are mainly technological or non-technological (social and people) (Tammets, 2012; Hoadley, 2012; Wenger, 2015).

**Technological systems:** Chatterton (2010), Penman and Rodger (2011), Tammets (2012), Hoadley (2012) and Kaplan (2013) classify the technological tools as hardware-centred technology (collaborative) and software-centred technology (voice over internet protocol (VoIP)). They support the knowledge accumulation, processing, storage, collaboration and sharing such as the Web 2.0 tools that sustain the needs for communication, socialisation, networking and collaboration, which are important for the CoPs (Tammets, 2012). Kaplan (2013) express that the collaborative tool also known as real-time conferencing, consists of the following: synchronous tools (audio-conferencing, web- and video-conferencing, chat, instant messaging and white boarding), asynchronous tools (discussion boards, calendar, website links, group announcements, messaging/e-mail, surveys and polls and decision support tools), content integration (streaming audio and video, narrated slideshows and web books), document management (resource library, document collaboration, version tracking and control and permission-based access.

**Social systems:** For Wenger (2000:225, 239), CoPs are the basic building blocks of a social learning system because they are the social 'containers' of the competences that make up such a system. That is, CoPs are part of a larger social learning system, which also include the boundary (the borders that determine whether one will belong to the CoPs or not) and the identity (what we know, what is foreign and what we choose to know, as well as how we know) that determine with whom to interact in a knowledge-sharing activity and the willingness and capacity to engage in boundary interactions.

**People systems:** This refers to the users of the CoPs and they support the technology and social system (Tammets, 2012). Kaplan (2013) identify four groups of people that support the strategic objectives and responsibilities of many typical CoPs. These represent people who are to affiliate (affinity networks); learn (learning communities); practice (communities of practice); and take action (project teams). The people have clearly defined roles that describe the relationships between the different roles in the community (including the instructor, subgroups, group leaders/facilitators and individual learners) and outline their responsibilities and interdependencies. The people create sub-groups of learners that have their own online space for small-group learning activities and group project collaboration. The people also support individuals by way of assisting learners to create personal profiles that contain their photos and salient information relevant to the topic at hand (e.g. for a course on marketing a profile item might include something fun such as "favourite innovative television commercial").

Sundrock (2006), Chatterton (2010) and Knoco (2014), on the other hand, consider the people as role players of the CoPs. Sundrock (2006) explains that these people serve as active and contributing members, ensure that the community functions as a knowledge-sharing mechanism and are involved in the start-up and growth of the community. Knoco (2014) stresses that the people develop and maintain the community processes and normally report to the community sponsor. The people are made up of the facilitators who support the leader and liaise with the sponsor by building membership, managing discussions and relationships (Knoco, 2014). Sundrock (2006) adds other members such as the core group and team members, occasional participants, lookers, subject matter experts, coordinators, member supports, information resources

and website administrator. Chatterton (2010) explains that each role can be played by one or more people and responsibilities can be shared throughout the team.

### 2.8.3 Mentoring and Apprenticeship Programmes

Mentoring involves a relationship between a less experienced individual (mentee or protégé) and a more experienced individual (mentor) (Beazley, Boenisch & Harden, 2002). In the academic environment, it is viewed as a dyadic, face-to-face, long-term relationship (Donaldson, 2000; Beazley, et al., 2002) between a supervisory and experienced knowledge expert and a novice (employee/student) that fosters the mentee's professional, academic, or personal development (Donaldson, 2000). It has been argued as the most effective way to transfer skills, know-how, experience and knowledge quickly and inspire loyalty in new and less experienced employees to cooperate in an organisation (Robinson, 2001). Donaldson (2000) and Beazley, et al. (2002) express that in mentoring, the mentor should establish a good relationship with his/her mentees/protégés and assess their needs, in consultation with other interested and appropriate parties. Each mentoring arrangement is unique and its particular nature will be established according to the personalities of the two individuals concerned (Donaldson, 2000)

Beazley, et al. (2002) assert that mentorship and apprenticeship are purposeful, open and mutual relationships, which result in learning and development with mutual respect, acceptance and trust. They are designed and implemented in organisations as a strategy to manage succession planning, manage talent and manage and safeguard knowledge. It ensures that there are adequate experts (people) to take over some tasks when more experienced employees leave (retire or resign) the organisation (APQC, 2015). Mentoring and apprenticeship are also designed to minimise the call-back of retired employees (knowledge experts) to the organisation at an exorbitant salary to transfer the knowledge that should have been transferred while they were still employees of the organisation (Mavuso, 2007:19).

During mentoring and apprenticeship, knowledge experts transfer their knowledge, know-how, wisdom, specific insights, experiences and skills to less experienced employees or newer employees so that when the experienced employees leave the organisation, the organisation's practices, knowledge, history, stories and culture are preserved (Meyer & Fourie, 2004:3; Mavuso,

2007:23; APQC, 2015). Apart from knowledge transfer and retaining expertise within the organisation, mentoring and apprenticeship help the mentee to become a recognised and accepted member of the organisation, by passing on corporate vision and values and improving his/her grasp of corporate networking (Mavuso, 2007:23; Frost, 2015).

Mentoring and apprenticeship in universities come in different forms: natural and planned (Myburgh, 2004:35), formal and informal (Frost, 2014), e-mentoring and situational mentoring (Mavuso, 2007:27), care guide, information source, friend, intellectual, flash, reverse, supervisory, team, guide group, peer and self-managed (Mavuso, 2007:23).

### 2.8.4 Storytelling

In the organisation, stories are used to capture knowledge and routines of the past and enable employees in the present to adapt it to the new conditions (Liebowitz, 2009). They are instrumental in knowledge sharing and collaboration in the organisation because listeners are given the opportunity to ask questions, which then puts the story into perspective (Tobin & Snyman, 2008:39). Sole and Wilson (2002) and Tobin and Snyman (2008:37) looks at three main building blocks for stories in an organisation: story-crafting (design of the story, including level of complexity and relevance); storytelling (who tells the story, whether it is oral or recorded and using different type of media formats) and story-listening (monitor the reception, use the feedback for design and content of future stories).

Frost (2015), citing Sole and Wilson (2002), expresses that storytelling is a means of sharing norms and values, developing trust and commitment, sharing tacit knowledge, facilitating learning and generating emotional connection. According to Kaye and Jacobson (1999:44) and Grobstein (2005), storytelling encourages people to share a broader understanding of things that might not otherwise be achieved. Kaye and Jacobson (1999:44) describe the typical sequence in storytelling as being the story (someone tells it, someone (or a group) listens); the understanding (listeners and narrators gain depth of understanding); and the shared meaning (groups use shared understanding as a metaphor and a kind of shorthand for wider understanding).

In terms of teaching and learning, storytelling is certainly one of the ways of transferring tacit knowledge so that others can use it and refer to it (Shim, 2006). It is important to acquire tacit knowledge from those people who have seniority and who have been with the university for some time. Storytelling is a way of capturing what is unique about an individual's experience and what is unique per individual is tacit knowledge. Storytelling is one of the prevailing forms of communication and it possesses a great potential for teaching and learning (LeBlanc and Hogg, 2006). Individuals stand to benefit in terms of satisfaction on the part of the storyteller and the listener (feeling of self-esteem), recognition (the story itself is a valuable contribution) and belonging (telling the story helps in relationship building) (Denning 2000: 51; Sole & Wilson, 2002). Denning (2000) further opines that stories enhance and change perceptions and are easy to remember, are inherently non-adversarial and engage the feelings of individuals.

### 2.8.5 Coaching

Coaching is concerned primarily with performance and the development of definable skills (Ridlehuber, 2001). For Antonioni (2000) and Abiddin (2006), coaching is a partnership between a manager (coach) and an individual (coachee) who reports directly to him or her (coach) in which the coach focuses on helping the coachee (learner) to optimise his or her potential. It usually starts with the learning goal already identified (Stevenson, 2014). The most effective coaches share with mentors the capability to help the learner develop the skills of listening and observing themselves, which leads to much faster acquisition of skills and modification of behaviour (Clutterbuck, 2001). Ridlehuber (2001) identified three main strategies for coaching: establishment of a relationship between the coach and coachee; observation to uncover technical and skill deficiencies that need coaching; and demonstration of alternative ways to increase an individual's effectiveness.

Franklin (2000) indicates that coaching empowers employees to be more productive and improve morale. Maher (2001) also indicates that coaching can help organisations to address five common concerns:

1. How to use time effectively and reduce over commitment and stress.
2. How to lead an organisation rather than just manage its day-to-day activities.
3. How to be strategic while being deluged with e-mail, voice mail, fax messages, telephone calls, regular mail and staff members, all requiring responses.

4. How to maximise the effectiveness of staff while avoiding micro-management.
5. How to deal effectively with difficult employees.

A survey commissioned by Manchester Consulting revealed that the personal benefits of coaching include improvements in working relationships, relationships with immediate supervisors, teamwork, relationships with peers and job satisfaction (Bolch, 2001). Bolch (2001) proposes that, the successful factors needed for effective coaching engagement are: a motivated client/customers; organisational and cultural support; tracking progress; and maintaining dynamics. However, Vander (2000) reports that successful coaching in organisations takes place when a coachee maintains a level of dedicated and commitment to the coach, as well as to the goals. The survey also shows that clients turn to their coach for help with time management, career guidance and for business advice.

## 2.9 Knowledge Management Frameworks

According to Knoco (2014), a KM framework is a comprehensive system of people, process, technology and governance, which ensures that KM is applied systematically and effectively to improve business results. Mostert and Snyman (2007) also express that KM framework is the application of the management functions (planning, organising, leading/directing and controlling) to an organisation's knowledge processes (knowledge acquisition, creation, evaluation, storage and retrieval, utilisation/application and management) with the aim of producing results through which the organisation can accomplish and maintain a competitive advantage. Frost (2015) supports this by outlining that the KM framework involves: identification of the organisation's needs; identification, acquisition, creation and processing of knowledge-related resources; retrieval, application and sharing of knowledge; and storage of knowledge. Mostert and Snyman's (2007) and Frost's (2015) definition of KM framework is premised on the foundation of the definition of KM by Du Plessis and Boon (2004) and Dimitriades (2005) who explain that KM is a management discipline concerned with the systematic acquisition, creation, sharing and use of knowledge in organisations, aiming to improve a firm's competitiveness.

It is significant to note that none of these processes are independent and all of them are affected by countless factors (Frost, 2015). Furthermore, Knoco (2014) expresses that this is why KM

frameworks are typically very different and can be presented in a wide variety of ways. For example, while some frameworks are sequential and try to provide a better overview at the expense of "realism", other frameworks display overlapping processes in an attempt to simulate what actually occurs inside an organisation (Frost, 2015). According to Frost (2015), the first thing to consider when designing a KM framework is to identify the components of the framework. At the most basic level, Frost (2015) expresses that KM consists of the following steps:

- Identification of needs
- Identification of knowledge resources
- Acquisition, creation or elimination of knowledge related resources (processes or environments)
- Retrieval, application and sharing of knowledge
- Storage of knowledge

### 2.9.1 Push and Pull Knowledge Management Framework

Snowden (2002) and Gupta (2004) developed the push and pull KM framework. The push framework involves actively managing knowledge whereby the members of the organisation strive to explicitly encode their knowledge into a collective knowledge repository or database and retrieve from the database the other individuals' knowledge captured into the database (Snowden, 2002). Chandrasekar (2011) explains that, in this case, knowledge flow is automatically activated without an explicit request from any knowledge seeker. That is, it functions as information delivery systems. Examples include critiquing, active help systems, agent-based systems and broadcast systems (Fischer & Palen, 1999). This strategy functions in situations where the knowledge worker or information seeker is unaware of the knowledge need or of the existence of knowledge that can be helpful. It thus alerts the knowledge worker about the existence of the knowledge that would be beneficial (Liebowitz, 2011).

The push framework saves time by matching available information with individual interest profiles. It produces serendipity, unknown and relevant knowledge (Fischer and Palen, 1999). However, it is the opinion of Liebowitz (2011) that implementation of the push framework in an organisation that does not make knowledge available at the time it is needed may lead to information overload or simply be annoying.

The KM solution that is needed most is the tool that helps determine what they need to know in the first place. Similarly, the biggest problem with gathering knowledge is simply knowing what questions to ask (Liebowitz, 2012). The pull framework involves individuals making knowledge requests from experts connected with a particular subject on an adhoc basis. In such an instance, expert individual(s) can provide their insights to the particular person or people needing the knowledge (Snowden, 2002). This requires a well-framed and articulated request (Liebowitz, 2011).

Chandrasekar (2011) argues that knowledge flow in the pull framework is from the selection activity to other knowledge manipulation activities and is essentially triggered by an individual's "Knowledge Seek" request. What organisation(s) need is a collaborative KM-filtering system and strategy that look at the historical information to help the user determine what information they need to know (Liebowitz, 2011).

Fischer and Palen (1999) further express that the pull framework is mainly a non-intrusive and information requisition and access system supporting users in expressing queries. This includes passive help systems, search systems/engines, browsing systems and bookmarks. However, Fischer and Palen (1999) caution that relevant knowledge may remain hidden until a formal request is made. Chandrasekar (2011) also expresses that people networks (CoPs) leverage knowledge through organisational pull rather than centralised push. Therefore, organisations that push information to their people through CoPs may actually cause information overload, blocking them from developing their own networks. For example, according to Dennis Fennessey, national director of client service technologies at Deloitte and Touché, "right now in their organisation it is 80% Pull; tomorrow, it will be 80% Push."

### 2.9.2 Top-down and Bottom-up Knowledge Management Framework

Robertson (2004) identifies the top-down and bottom-up KM frameworks. With the top-down framework, the overall strategic direction of the organisation is used to identify the focus of the KM initiative. Zhu (2014) stipulates that the top-down framework begins by establishing the KM goals that the organisation wants to achieve and implementing measures that will determine the

success of the goals. Convincing and agreements with top-level management are crucial, since KM must be accepted by them before implementation. Zhu (2014) further expresses that the most important thing is to understand the various KM activities that are required to enable business processes. The framework will then look at the organisational structure to determine policies and regulations that must be charted and who (individuals) in the organisation is/are directly and indirectly involved in the KM implementation process.

According to Remenyi (2012), this framework is based on the wants and needs of the organisations stakeholders and is supported by knowledge champions. Knowledge champions are at the core of a KM practice in an organisation linking themselves to employees to acquire and disseminate knowledge (Skyrme, 2008). Furthermore, knowledge champions of the organisation promote a KM culture, implement reward structures suitable to such a culture by networking them with the organisations human capital and influence senior management to reinforce this (Skyrme, 2008; Frost, 2010).

The bottom-up KM framework on the other hand, is an assessment process where the knowledge performance indicators are used to derive the strategy by identifying the core competencies (Remenyi, 2012). It often starts with a small core of interested and active enthusiasts, as is the case in eg both Siemens and BT (Quintas, 2004:36). In a bottom-up framework, Robertson (2004:3) is of the view that research is conducted into the various activities of staff involved in key business processes of the organisation. The findings of this research will highlight key staff needs and issues, which are then tackled through a range of KM initiatives. According to Remenyi (2012), when using this framework, the assessment is used to explore the capabilities and its underlying knowledge assets in order to identify a strategy based on the key knowledge assets and core competencies identified.

A bottom-up KM framework should receive much support from all the staff, as it will involve them and their ideas (Knoco, 2012). Ideally, the bottom-up strategy would be a preferred framework as opposed to the top-down framework, since KM requires a lot of commitment and willingness from the staff (Medal, 2008). The bottom-up framework applies especially to informal methods of knowledge sharing. These may be very effective, but some top-managers find it

difficult to allow them to take place. From the bottom up, the workforce needs to take ownership of processes and to make sure that descriptions of the process remain in step with what actually happens (Shaw & Edwards, 2005).

Although the top-down and bottom-up strategies have their strengths and weaknesses, an effective KM programme must encompass both (Robertson, 2004). Remenyi (2012) states that it is important that the CKO use top-down and bottom-up simultaneously. This is because the top-down tasks are best able to handle and manage best standards (common tools) and also help to measure what is working (low-cost shared services), but keep several resources close to the core business teams. When establishing policies, the top level needs to be aware of what is going on at the bottom levels of the organisation to ensure understanding and compliance. If KM frameworks are simply developed by top management without taking into account the staff's needs, there will be problems in getting the staff involved in the new processes. On the other hand, without management support, strategies will not be implemented successfully. According to Robertson (2004), the process of developing an effective top-down and bottom-up KM framework is as follows:

- Identify the key staff groups (people/individuals) involved in the most important business activities.
- Use the triangulation information collecting techniques such as interviews, surveys, workplace observation and so on to identify the needs and concerns of the groups identified.
- Identify an overall strategic focus to provide a guide, or a framework for the KM activities.
- Based on the research findings, come up with a few alternatives, compare them and select the best alternative.

### 2.9.3 Codification and Personalisation Knowledge Management Framework

According to Hansen, Morten, Nohria and Tierny (1999:107), most organisations primarily focus on one or the other of two broadly defined KM framework: codification or personalisation. Tsui (2003) describes it as the two most dominant frameworks to deploying KM initiatives in organisations. This framework is related to the tacit and explicit concept. Codification is primarily implemented in the form of electronic document systems, databases of information, previous reports and presentations, all of which have disguised customer information (Hansen, 2004) that codifies and stores knowledge and permits its easy dissemination and re-use (King, 2009).

Knowledge workers' experiences, skills and know-how are stored in documents, either in hard copy or electronic soft copy. The knowledge is not connected to a specific person and reused for multiple projects. This idea of reuse is critical to codification strategy and its role in creating large revenues. It "provides high-quality, reliable and fast information-systems, implementation by reusing codified knowledge" (Hansen et al., 1999:108).

Anduvare (2015), citing Pourdarab, Nadali and Nosratabadi (2011:61), observes that in a codification strategy, the individual knowledge is combined, put in a cohesive context and centrally made available to the members of the organisation via databases and data warehouses. Codification highlights the capability to help gather, create, store, share and effectively use an organisation's explicit knowledge.

To utilise codified knowledge a precisely defined problem domain is required (Hansen et al. 1999:108). Devoid of that, finding an appropriate report according to the present needs can be more complex. Employees have to understand where they can find the desired information or enter their experiences (people-to-documents) (Hansen et al., 1999:108; Hansen, Rose & Tjørnehøj, 2004).

The codification strategy's goal, as Hansen et al. (1999:107) argue, is to provide scaffolds that lead to standardised reports. These are then collected in a knowledge base. This standardisation makes it easy to search for the documentation of previous results, which, if similar enough, can help in the current situation. Hansen et al. (1999:107) also explain that a competitive strategy, which would apply the codified KM strategy, typically aims to provide high-quality solutions that are reliable and specialised in a certain field. A company that produces high-end solutions to a specific problem for different customers is an example of that. Earl (2004) states that the codification strategy is characterised by the following:

- Systems for creating and refining knowledge repositories/bases and on motivating people to create and provide content for the system
- Processes and procedures: that is, developing and using repeatable processes and procedures that are supported by knowledge from previously conducted processes and procedures

- Commercial: management of intellectual assets and properties such as patents, trademarks, etc.
- Strategic development of knowledge capabilities and competence that can form the foundation of competitive strategy in the organisation

Personalisation, on the other hand, emphasises developing networks to facilitate knowledge creation and knowledge sharing between people. The focus is on people and their direct communication among each other (Hansen et al., 1999:108). In the terms of Hansen et al. (2004), it is based on expert economics, channelling individual expertise to others with less expertise who may employ it to further the organisation's goals. Hansen et al. (2004) express that the personalisation strategy does not make a distinction among the knowledge and the knowledge provider. It identifies the tacit dimension of knowledge and assumes that knowledge is shared mainly through direct person-to-person contacts and relies on IT. The role of IT here is to facilitate effective communication and KM between members of the organisation through tools such as e-mail, group support systems. The objective of the personalisation strategy is to transfer, communicate and exchange knowledge via knowledge networks such as discussion forums (Greiner, Böhmann & Krcmar, 2007:5).

According to Hansen et al. (1999:108), an organisation that critically follows the personalisation KM strategy, characteristically tries to support creativity and individual approaches to distinctive tasks. The organisation faces only very limited problems, embracing the variance of each project and activity in order to provide a specialised solution, where different levels and areas of expertise are important. Therefore, the KM is more focused on linking the employees (person-to-person). This is often supported by an open organisational culture that supports personal communication and offers circumstances to share knowledge (e.g. in form of meetings). Earl (2004) states that personalisation strategy is characterised by the following:

- Cartographic: creating knowledge maps or directories and networks to connect people
- Social (spatial): socialisation as a means of knowledge creation and exchange; emphasises the provision of physical "places" to facilitate discussions
- Organisational: providing groupware and intranets to facilitate CoPs

Whereas many organisations start by highlighting the significance of codification, Anduvare (2015) opines that the personalisation KM strategy is not suitable for all types of knowledge. This is because some tacit knowledge can be very challenging to codify and it might be easier to pass it on through direct contact and/or observation. Even if it is possible to codify knowledge, the benefits may not rationalise the time and effort involved. In addition, if knowledge changes very quickly, it can be more efficient for the individual with the knowledge to pass it on directly, as and when it is required.

Finally, Venkitachalam, Scheepers and Gibbs (2003) express that most KM strategies selected by organisations fall into these two categories (codification and personalisation). According to Hansen, et al. (1999), the effective application of KM strategies is to follow one strategy principally and use the other one to support it. This could be 80% of one strategy (principal) and 20% of the other (supportive).

### 2.9.4 Frost's Integrated Knowledge Management Framework

Again, looking at these different KM frameworks, there is one other important aspect involving KM that has not been dealt with directly by these frameworks. Frost (2010) thus created an integrated KM framework that seeks to combine the KM process into a framework that focuses on the strategic perspective. Frost's (2010) integrated KM framework seeks to link both KM process and KM strategy and at same time offering specific initiatives at different stages.

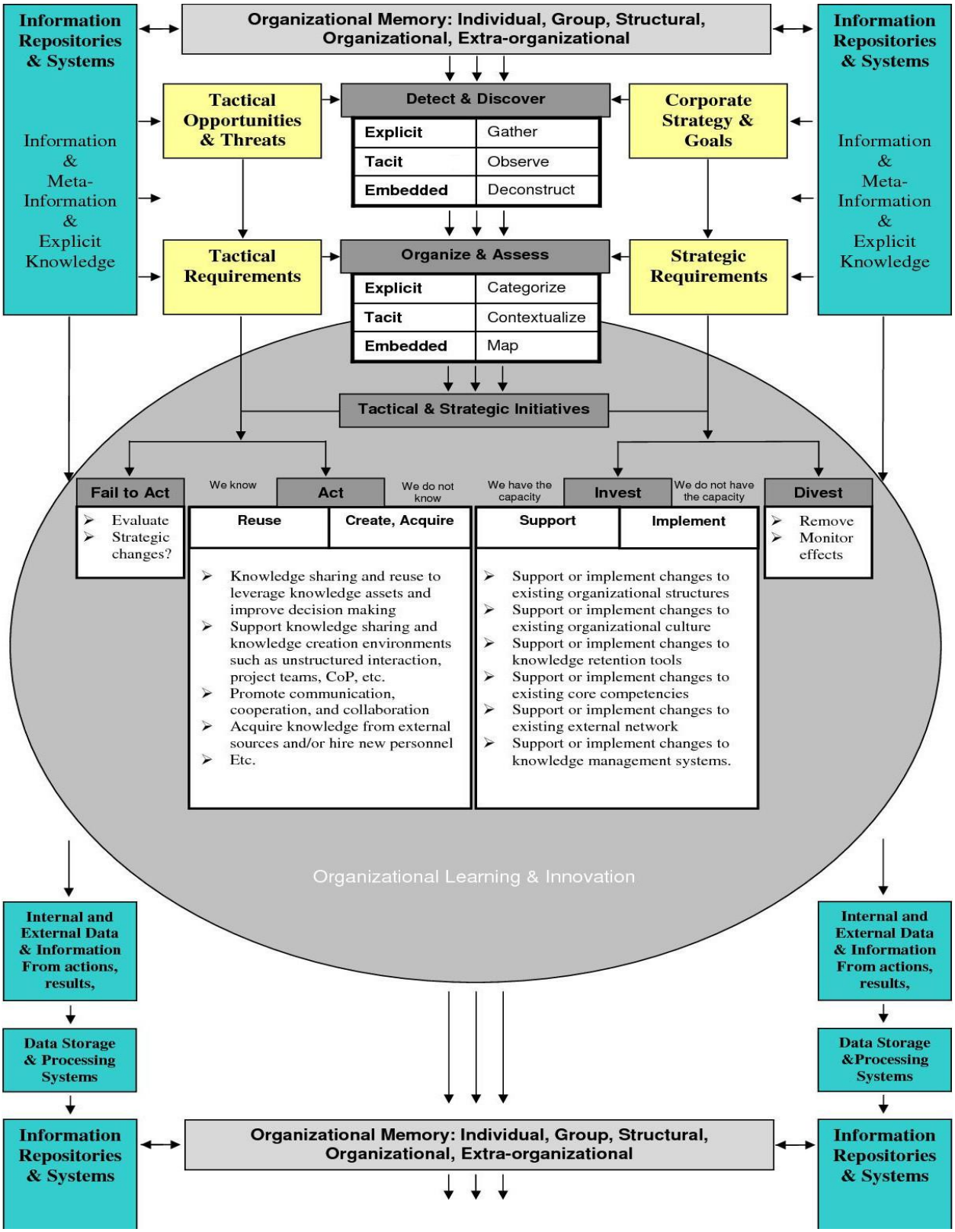


**Figure 2.2: Frost's (integrated) KM framework**

Source: Frost (2015)

The framework also outlines the connection of information and information management systems to KM. This framework builds on the previous frameworks by integrating information, strategy and organisational memory. It covers the major requirements of a framework such as:

- needs identification
- knowledge resources identification
- acquisition, creation, or elimination (unwanted knowledge) of knowledge-related resources/processes/environments
- retrieval, application and sharing of knowledge
- knowledge storage.

The integrated KM framework draws on elements presented by Bukowitz and Williams (1999), Nonaka and Takeuchi (1995), Gamble and Blackwell (2001) and Botha, Kourie and Snyman (2008). It also includes the concept of organisational memory as defined earlier.

The dark grey components signify KM initiatives, the yellow rectangles signify organisational strategy, while the teal rectangles represent data and information systems and repositories. Frost (2010) also introduces the process element from tactical and strategic considerations. This demonstrates the way KM strategy works in tandem with organisational strategy. Finally, the non-bolded section in the grey oval displays the KM processes that take place in the organisation as it operates and which management affects/enhances through its initiatives.

## 2.10 Knowledge Management in Universities

Knowledge has always been created in universities (Mikulecká & Mikulecký, 2000). The National Accreditation Board (NAB) (2015) describes a university as an Institutions of Higher Education (IHE) designed for advanced instruction and research in several branches of learning, conferring degrees in various faculties and often embodying colleges, schools, departments and similar institutions. Embedded in universities are different smaller units/divisions such as libraries/information or knowledge centres, registry/administration, ICT directorate, colleges, institutes, centres, faculties and/or schools and departments, all of which may be entirely different from each other in relation to their operations, although they are geared towards achieving the

same goals (NAB, 2015). Shattock (2010:7) also expresses that universities are multi-faceted and multi-product/service oriented organisations taking on supplementary roles, specifically in relation to the knowledge economy and social inclusion. Although the core business of universities remains teaching, research, learning and innovation (Henard, 2012), this enlargement of universities' role represents a significant new dimension in a university's life and can be critical to the way universities are now regarded by their stakeholders (staff, students, local communities, shareholders, alumni, partners and government) (Shattock, 2010: 7; Henard, 2012).

KM is significant in universities more than ever before through the increasing dependence on knowledge to grow organisations and economies coupled with the information overload (Mikulecká & Mikulecký, 2000). This is due to new technologies that have made it easier for the universities to create and share information and knowledge. Universities can benefit from KM by creating and maintaining relevant knowledge repositories, improving knowledge access, enhancing the knowledge environment and valuing knowledge (Mikulecká & Mikulecký, 2000).

In the university setting, two types of knowledge exist: organisational knowledge and academic knowledge (Coukos-Semmel, 2003). Organisational knowledge refers to knowledge of the overall setup of the university: its strengths and weaknesses, the markets it serves and the factors critical to the university's success (Coukos-Semmel, 2003). It may include the group knowledge from the various units or departments within the university such as all the tacit and explicit knowledge of the university (Mikulecká & Mikulecký, 2000).

Academic knowledge has commonly been viewed as the measurable properties of individuals, referring to academic achievement and tests (Hughes, 1999). According to Petrides and Nodine (2003), academic knowledge enables people within a university to develop a set of practices to collect information and knowledge and share what they know, leading to action that improves services and outcomes. Academic knowledge is the primary purpose of universities, colleges and schools (Ratcliffe-Martin, Coakes & Sugden, 2000).

From an academic perspective, universities are considered the traditional hub of knowledge production, storage, dissemination and authorisation. This is because universities usually possess

a modern information infrastructure and the sharing of knowledge with others is natural for professors and teachers in general. Furthermore, there is a natural desire of students to acquire knowledge from accessible sources as fast as possible, there is usually a trustful atmosphere at universities and no one hesitates to publish or is afraid to publish or otherwise disseminating her or his knowledge (Mikulecká & Mikulecký, 2000). Pircher and Pausits (2011) similarly describe the universities as organisations staffed with experts in all sorts of fields who contribute their expertise and experience to the endeavour of producing and preserving knowledge. They serve as the main instruments of society for the constant pursuit of knowledge in a suitable environment for the application of KM principles and methods (Mikulecká & Mikulecký, 2000).

Dalkir (2011) indicates that universities manage different types of knowledge. Cochran-Smith and Lytle (1999) provide a valuable distinction in the types of knowledge that inform practice in a university: knowledge of practice, or information about student performance; and knowledge for practice, or information about best practice. Irrespective of the type, Galbreath (2000) explains that the knowledge production, storage, dissemination and authorisation start at the individual (student and lecturers) level. They then create the departmental knowledge and the domains of knowledge across the departments that share academic interests or disciplines. The departmental knowledge also creates the university's knowledge networks and networks with other universities (Galbreath, 2000).

As modern universities are very much also business organisations with many business activities in the "educational market", any method of increasing their competitive advantage might be very useful and interesting for them. The application of capabilities, techniques and technologies to manage knowledge is the right approach and direction (Mikulecká & Mikulecký, 2000). Its proper application 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 (Kidwell, 2001). Likewise, the universities need to acquire, learn and gain knowledge not just for the enhancement of staff performance, but also for the overall performance of the universities and to improve competitive performance (Galbreath, 2000).

Mikulecká and Mikulecký (2000) also assert that the most realistic and achievable goal is to introduce and exploit KM principles, methods and tools for improving the level of such "business" processes that are typical to the university environment. Just to mention some most important ones, Mikulecká and Mikulecký (2000) list the following:

- Adaptive online administration of the student enrolment process with an automatic creation of study interests profile, allowing to push and retrieve relevant information and knowledge, to enable them tailored access to relevant resources, including a tailored timetable.
- Supporting the process of students' orientation in the university practices, resources using a shared knowledge repository of best practices, basic university documents, interactive campus maps, electronic access to some shopping facilities or to ordering some necessary services.
- Supporting the student's study process by an intelligent and tailored dissemination of information and knowledge relevant to his or her study programmes, individual modules, practicals and other similar activities.

In the universities, knowledge usually provides a set of designs for networking people, procedures and processes and technologies and deliberate how the universities can promote policies and practices that help people share and manage knowledge (Petrides & Nodine, 2003). Mikulecká and Mikulecký (2000) state that KM in universities brings together three core resources: people, processes and technologies. The "people" (students and staff) represent the creators, managers and users of the knowledge. The knowledge builds on collegial and professional teamwork by actively engaging the people at departmental, faculty, school and university level to share with other team members what they know and what they are learning. Petrides and Nodine (2003) advocated that universities should develop and implement policies and practices to help them share and manage the knowledge.

The knowledge "processes" represent a range of different ways of making knowledge. They are forms of action, or things you do in order to know (Kalantzis & Cope, 2013). Petrides and Nodine (2003) note that formal and informal administrative procedures, curriculum development processes, information sharing patterns, information silos, salary incentives, award schemes and

many other work practices affect the information flow within universities. KM initiatives help to establish robust processes that enable people to get the information they need when they need it, as well as to share it with others who may benefit from it. KM helps to promote those processes that lead to a more informed decision-making (Mikulecká & Mikulecký, 2000).

Nickels (2001:523) says that "technologies" are the systems and structures that add a layer of intelligence to information, to filter appropriate information and deliver it when it is needed. It is the most effective platform for target groups to access and exchange useful information across departments. Therefore, KM technologies and systems can be used to manage knowledge in universities better, not only by building up people networks, but by also by enriching knowledge in the university communities to improve competitive performance (Petrides & Nodine, 2003).

### 2.10.1 Studies Related to Knowledge Management in Universities

Anduvare (2015) conducted a KM assessment at the Marist International University College (MIUC), Nairobi, Kenya in order to identify and recommend a suitable strategy for the institution. The study revealed a variety of informal KM structures and resources at the MIUC. The study also established the following findings: there are substantial KM processes at the MIUC, spread out over the various departments; KM is not undertaken formally; there is goodwill from the leadership to support KM initiatives although it was indicated that financial constraints may hinder the efforts; there is a need for a culture change supported by management for KM to work effectively; there is a good base for ICT infrastructure in terms of availability of computers and internet connectivity, but much more needs to be done in terms of tools that support KM; training of staff in proper ICT use and policies that would synchronise proper and standardised use of ICT to enhance KM; the area of KM measurement needs review and action; and there are quite a number of policies at the college, but not specific to managing knowledge.

Notably, the study by Anduvare (2015) establishes seven types of strategies that can be used to manage and safeguard knowledge: explicit- and tacit-oriented strategies; bottom-up and top-down approach; system and human-oriented strategies; codification and personalisation; process-oriented strategy; dynamic strategy; and passive strategy. Also, six critical components of a KM strategy were established: KM vision, business strategy and objectives; budget and cost benefit

analysis; knowledge mapping and expertise identification; inventory of KM resources and structures derived from the results of a KM assessment conducted; approach or select KM strategy; and measurement and implementation plan. Finally, the study reveals that the success factors to KM implementation are: technology; knowledge identification, capturing, sharing, access, storage and use; knowledge champions; training; organisational culture; management support and leadership; strategy; knowledge infrastructure; budget; and measurement.

Al-oqaily et al. (2014) investigated the success factors of KM in universities by focusing on Jordanian private universities. The research used a questionnaire to collect data from 64 respondents (academic members) in information technology colleges in Jordanian private universities. The research established that the Jordanian private universities have the most important and successful factors of KM implementations: organisational culture; effective and systematic processes; knowledge measurement; knowledge organisation; and knowledge systems infrastructure. The findings from the study established that universities should be aware of the distinction between the employees' qualification levels, years of experience and the effectiveness of the IT infrastructures. This is to ensure best adoption of KM implementation in universities.

Hoq and Akter (2012) explored the role of knowledge workers in universities. They established that universities are the highest centres of teaching, research, learning and innovation. Their findings indicate that the role of knowledge workers is quite significant, as the universities need to build good information infrastructure and create conducive atmosphere where all the stakeholders such as teaching and non-teaching staff, students, researchers and patrons can take part in various KM activities. By promoting knowledge creation, sharing and application, knowledge workers in universities can bring about enormous changes in the university's organisational cultures and individual behaviours relative to knowledge. Finally, Hoq and Akter (2012) discovered that universities play a significant role in the building and unhindered development of a knowledge-based society by recruiting skilled and competent knowledge workers and empowering them to manage the knowledge assets effectively.

A study on enhancing knowledge retention at the University of Zambia (UNZA) was done by Wamundila and Ngulube (2011). The study established that although 13.7% of the respondents

mentioned that teaching practice manuals were available, they were found to be limited for functions such as recruitment, consultancy and training. The findings therefore reveal that none of the recognised documented processes, policies, procedures and work manuals covered the core academic functions of UNZA such as teaching, research, curriculum development and academic citizenship. With regard to records, policies and documentation management, UNZA reflected an organisation in dire need of business process reengineering.

Wamundila and Ngulube (2011) established that although policy on training was available, there was no comprehensive policy on other human resources functions such as industrial relations, safety and health and performance appraisal. Further findings from the study show that the policies, processes, procedures and work manuals were not documented, thus really breaching the principles of knowledge retention. Notably, the study by Wamundila and Ngulube (2011) establishes that knowledge acquisition, creation, sharing and application sustained KM practice at UNZA. Similarly, some of the knowledge creation strategies adopted by UNZA include training and development, interviews, brainstorming, expert systems, subject matter experts and after-action reviews. The study also reveals that knowledge practices at UNZA included CoPs, succession planning, mentorship, coaching, knowledge repositories, storytelling, phased retirement, orientation and job rotation.

Mohayidin, Man, Kamaruddin and Margono (2007) also conducted a study on the application of KM in enhancing the performance of Malaysian universities. The main objective of the study was to assess the level of KM practice among the academics and to determine the factors contributing to the effectiveness of KM practices at individual, faculty and university level. The study focused on eight local universities: four public and four private universities. The researchers used factor analysis to determine factors affecting the KM practices while multiple regression analysis was used to analyse and determine the importance of various variables that will add value and thus improve the performance of Malaysian universities. The results indicate that info-structure support; infrastructure capacity; info-culture; and knowledge acquisition, generation, storage and dissemination are important factors in shaping the KM initiatives in Malaysian universities. It was established that infostructure was the most significant variable.

### 2.10.2 Knowledge Management in Libraries and Information Centres

Husain and Nazim (2013) investigated the concepts of KM among library and information science (LIS) professionals. The aim of the study was to identify, collect and review relevant literature on the concepts of KM among LIS professionals. The study established that although the concept of KM emerged in the business sector, its practices have been used in non-profit, public sector, academic institutions and libraries. Thus, LIS professionals have acknowledged the importance of KM in libraries and information centres (LIC). The study also reveals that the libraries have both explicit and tacit knowledge embedded in the working processes and experienced employees; KM helps to improve the quality of services rendered to clients; KM perceptions among LIS professionals are varied and they generally view KM as the management of recorded knowledge, instead of sharing and using tacit knowledge embedded in employees; and LIS professionals have positive attitudes towards the application of KM in libraries and they see it as the best method for improving library functions and services. It was also established that LIS professionals' skills in indexing, cataloguing and classification, authority control and database management are still relevant for KM. However, the LIS professionals need some additional skills such as managerial, leadership and interpersonal skills. Finally, the study established that KM offers opportunities for LIS professionals from their involvement in KM.

Nazim and Mukherjee (2011) explore LIS professionals' perceptions of KM concepts, its applications and their perceived challenges to incorporate it into academic library practices. The study is based on the review of relevant literature and the results of a web-based survey of LIS professionals of academic libraries in India. The study established that the concept of KM was well known to the LIS professionals. However, their degree of understanding of the concepts varied and primarily focused on the management of explicit knowledge. Nazim and Mukherjee (2011) also established that although some of the LIS professionals were informally involved in KM, their roles were perceived as elementary. The respondents believed that the important tools for KM in libraries include CoPs, professional education and training programmes, knowledge sharing and information technology. Furthermore, it was revealed that the major constraints for the implementation of KM in libraries were a misunderstanding of the KM concept and a lack of knowledge-sharing culture, incentives and rewards, top management commitment, IT infrastructure and financial resources.

### 2.10.3 Knowledge Management in Ghanaian Universities

The demand for tertiary education in Ghana does not match the expansion of existing facilities and resources and tertiary education is also not offered in significant portions to the population who desire for it (Awidi, 2008). Similarly, Lwoga (2012) expresses that the growing numbers of student enrolment and academic programmes and the declining number of trained lecturers have enlarged demands on faculty, leading to less time for teaching than has previously been the case in universities in Ghana for some decades. Universities in Ghana have had the unpleasant duty of turning away a large number of qualified applicants (potential students) every year as a result of their inability to admit even half of the qualified applicants (Asabere & Mends-Brew, 2012).

Furthermore, Ghanaian universities continue to face enormous challenges (Awidi, 2008), which include increasing demand for university education from qualified candidates, overburdened teaching, learning and residential facilities in the face of socioeconomic pressures to make education accessible to all. There is also the challenge to strike a balance between effective use of existing resources and intensified demand for delivery of better education, reduction in funding and government support, low teacher-student ratios and an aging teaching staff and an increasing industry demand for a market-led curriculum (Addah et al, 2012). These challenges, although a source of worry, seem at least partly amenable to KM and technological solutions (Awidi, 2008).

KM technology has enabled online education in many countries, including Ghana (Awidi, 2008). Also, KM technologies continue to have a significant impact on the curricula, the methodology of teaching and the learning processes in universities (Glenn, 2008). For instance, the universities could use KM technology to deliver training outside the university, compensate for teacher-student ratios, widen access to teachers across the globe, control or lower the cost of higher education and support a market-driven curriculum by creating a flexible learning environment (Awidi, 2008).

In realising the gargantuan potential of technologies in KM as against the universities' ever-increasing student population, universities in Ghana have begun to implement KM systems and strategies such as CoPs and e-learning as a medium to transform the universities into a modern citadel of academic knowledge in all spheres of their academic endeavour (Awidi, 2008). The

universities are adopting e-learning as a viable complement to the conventional face-to-face education (Asabere & Mends-Brew, 2012). They are building infrastructures and acquiring the needed technologies to support teaching and learning (Awidi, 2008). Additionally, they are committing more financial resources to the implementation of KM systems to aid teaching, learning, innovation and research (Agbatogun, 2006).

The objective of implementing e-learning systems to facilitate KM in Ghanaian universities is to make quality education at all levels more accessible and relevant to meet the needs of Ghanaians in order to enhance their performance and improve the quality of their lives (Addah et al, 2012). Specifically Ghanaian universities have sought to use KM systems and strategies such as e-learning system to:

- provide opportunity for a large number of qualified applicants who do not get admission into the face-to-face programmes as a result of limited facilities for tertiary education
- create the opportunity for work and study
- increase access to and participation in education at all levels for all
- facilitate progression through the education system from basic to tertiary
- improve the capacity of Ghanaians to cope with the technological advancement and the knowledge society and be able to enhance their contribution to nation building
- increase equality and democratisation of education
- provide cost-effective and affordable education
- serve as an avenue for financial resource mobilisation for public universities.

Win (2002) found that lecturers' level of technology education influences their ability to teach and share knowledge using KM systems. In the same way, the motivation of lecturers affects the effectiveness of teaching emerging technologies. However, Ghanaian lecturers have been polarised in their acceptance of the new technologies for knowledge sharing. While some have enthusiastically integrated computers and the internet into classrooms, lectures and knowledge sharing, others are cautious in their welcome and some have simply rejected the technologies.

Research has shown that the implementation and use of KM systems and strategies among Ghanaian universities can improve teaching, research, innovation and learning practices (Adanu

& Dagada, 2010). For example, a survey of e-learning experiences among students and lecturers of two universities in Ghana by Adanu and Dagada (2010) and Naidoo and Chikasha (2010) revealed that universities with KM systems and methods are "more effective" in KM compared to other methods of learning such as the traditional and classroom method. In addition, students' and lecturers' prior learning and teaching experiences, conceptions of learning and study approaches underpin the quality of their learning outcomes. Similarly, research conducted by Addah, et al. (2012) reveals that e-learning systems implemented in Ghanaian universities bring some benefits, which include: easy access to courses, lectures, lecture notes and reading materials anytime and anywhere, irrespective of the geographical location of the student; learning is self-planned; promotes collaboration among students through technology tolls; and improves learners' retention of knowledge by drawing learners to their topics of interest.

## 2.11 Implementing a Knowledge Management System

According to Albers (2009), the decision to implement KM systems in organisations needs strong support (technical and non-technical) to be successful. From a simplified perspective, a KM system integrates people, processes and technology (Frost, 2014). A KM system results in changing how organisations operate and requires organisational mechanisms (incentives and policies) to change employees' attitudes and operation processes (Albers, 2009). However, many organisations are still grappling with issues concerning the implementation of KM systems and the needed practical methods to implement them.

KM practitioners and researchers have tried to establish some specific protocols for implementing KM concepts, techniques and practices. Some KM implementation procedures that have been researched at organisations often include various common stages such as planning, initiation, development and integration (Oliveira et al., 2012). Rao (2014) developed the 8-C (Connectivity, Content, Community, Culture, Capacity, Cooperation, Commerce and Capital) framework for implementing KM. Rao (2014) suggests that to have a successful KM system, organisations need to answer all the eight Cs.

Similarly, Dataware Technologies (1999) proposed a seven-step approach to the implementation of KM systems in organisations: identify the business problem; prepare for change; create the KM

team; perform the knowledge audit and analysis; define the key features of the solution; implement the building blocks for KM; and link knowledge to people. This approach also presents specific technical solutions and capabilities that allow for a step-by-step implementation of the KM building blocks mentioned in Step 6. These solutions are:

1. Access existing knowledge silos to obtain immediate ROI from your existing resources
2. Implement simple knowledge mining for more efficient access
3. Automatically categorise to deal with new knowledge
4. Build a knowledge warehouse to make knowledge widely available
5. Enable end-user contribution to allow increased knowledge flow
6. Expand the use of metadata and taxonomies for effective categorisation of knowledge
7. Locate the experts in the organisation – create a knowledge directory

Furthermore, Albers (2009), Malhotra (2002), Tiwana (2002) and Lingham (2010) concurrently agreed on a 10-step road map to implementing a KM system in an organisation. Tiwana (2002) explains that this road map is not just a methodology, but also a guideline for strategising, designing, developing and implementing KM systems and initiatives with a specific organisation in mind. It is therefore important to understand the uniqueness of every organisation since a blanket initiative or strategy cannot work for all organisations. The 10 steps and the phases in which they appear are as follows:

1. Phase 1: Infrastructural evaluation
    - Step 1: Analysing the existing infrastructure
    - Step 2: Aligning KM and business (organisation) strategy
2. Phase 2: KM system analysis, design and development
    - Step 3: Designing the KM architecture and integrating existing infrastructure
    - Step 4: Auditing and analysing existing knowledge
    - Step 5: Designing the KM team
    - Step 6: Creating the KM blueprint
    - Step 7: Developing the KM system
3. Phase 3: KM system deployment
    - Step 8: Deploying results-driven incremental (RDI) methodology
    - Step 9: Leadership issues

4. Phase 4: Metrics for performance evaluation
    - Step 10: Impact assessment of returns and performance

## 2.12 Chapter Summary

This chapter of the study expounds on concepts of KM and reviews some research studies and published literature on KM, with particular focus on knowledge pyramid; KM concept; KM systems; KM strategies; KM critical success factors; KM implementation stages; and KM frameworks. In addition, studies related to KM implementation in universities, libraries and information centres and Ghanaian universities.

From the reviewed literature, this study establishes that KM as a key strategic initiative has been embraced by a growing number of organisations. By introducing KM into the processes of many organisations, they have been able to improve the flow of knowledge in their organisation and make it accessible when and where needed to use it to add value and for a competitive advantage. It was also revealed in this chapter that, if organisations have KM processes, systems, strategies and enablers in place, KM would be possible. This was supported by some of the studies reviewed (Wamundila & Ngulube, 2011; Ramohlale, 2014; Chigada, 2014; Anduvare, 2015), which revealed that if knowledge is properly managed in an organisation, it can be a competitive advantage for that organisation.

The next chapter outlines the background and profile of tertiary education in Ghana and the selected universities.

# CHAPTER THREE
# BACKGROUND TO TERTIARY EDUCATION IN GHANA AND THE THREE SELECTED UNIVERSITIES

## 3.1 Introduction

Chapter Two of this study reviewed the literature on the knowledge pyramid, KM, KM systems, KM strategy and framework, implementing KM and KM in universities. This chapter discusses the background and profile of tertiary education in Ghana and the three universities that were selected for this study: University of Ghana, Legon; University of Professional Studies, Accra; and Ghana Technology University College, Ghana. The purpose of this chapter is to present historical background of tertiary education in Ghana and the selected universities: academics; mission and vision statements; and staff and students population. It also presents the partnership and collaborations they have with other universities and institutions of higher learning.

## 3.2 Tertiary Education in Ghana

Tertiary or higher education in Ghana usually refers to universities, colleges, polytechnics and post-secondary specialised educational institutions such as the military and police academy, technical and vocational training centres and so on. Admission into these institutions generally begins after the successful completion of senior secondary/higher education. The tertiary educational institutions perform the functions of teaching, training, research and services. Each institution's programmes of study attempt to translate these core missions into achievable goals for its students (NAB, 2015).

The National Accreditation Board (NAB) of Ghana is an agency of the Government of Ghana, resorts under the Ministry of Education and is responsible, among other things, for the accreditation of both public and private institutions with regard to contents and standards of their programmes and for determining, in consultation with the appropriate institutions or body, the programme and requirements for the proper operation of their institution and the maintenance of acceptable levels of academic or professional standards. It is also responsible for the determination of equivalences of diplomas, certificates and other qualifications awarded in Ghana and elsewhere (NAB, 2015). NAB (2015) categorises tertiary institutions into the following:

- A university: An educational institution designed for advanced instruction and research in several branches of learning, conferring degrees in various faculties and often embodying colleges, schools and similar institutions.
- University college: An institution of higher learning that is affiliated to a university and that offers instructions based on programmes approved by the university to which it is affiliated and whose degrees/diplomas/certificates are awarded by the parent university.
- Polytechnics: An institution of higher or further education in which courses in a large range of subjects, especially those of a technical or vocational kind are available.
- College: An establishment for further or higher education in the liberal arts (Pure Science/Humanities) or professional studies, sometimes, part of a university, e.g. business college, college of music, naval college.
- School: An educational institution devoted to a special branch of higher education, e.g. school of education, school of economics, school of medicine, school of law.
- Institute: An establishment offering advanced courses in the professions, or the arts, or science and technology.
- Academy: A place of study or training in a special field, e.g. military academy, academy of dance, maritime academy.
- Tutorial college: An institution that prepares students to take the examinations of a university or a recognised professional body.

Currently (2016), there are eight public universities, 10 professional public universities, one regional university, three chartered private universities and 51 university colleges affiliated to the public/government universities in Ghana and/or outside Ghana. Additionally, there are 10 polytechnics, 38 colleges of education, 66 colleges of health, 15 professional colleges, 11 tutorial colleges, two distance-learning centres, 11 foreign universities and other specialised institutions such as the Ghana Police Command and Staff College (GPCSC), Ghana Armed Forces Command and Staff College (GAFCSC) and so on. Every year, these tertiary institutions enrol over 100,000 students in undergraduate, post-graduate, certificate and diploma programmes in the full range of academic and professional fields (NAB, 2015). The brief profiles of the selected universities under study are:

1. University of Ghana, Legon

2. University of Professional Studies, Accra (UPSA),
3. Ghana Technology University College (GTUC).

### 3.3 University of Ghana, Legon

The University of Ghana (UG), Legon, is the oldest and largest of all Ghanaian universities and tertiary institutions. It was founded as the University College of the Gold Coast by Ordinance on 11th August 1948, based on the recommendation by the Asquith Commission on Higher Education in the then British colonies for the purpose of providing and promoting university education, learning and research. It was originally an affiliate College of the University of London, which supervised its academic programmes and awarded degrees (Daniel, 1996).

The University College of the Gold Coast gained full university status on 1st October 1961. Dr Kwame Nkrumah (First President of the Republic of Ghana) became the first chancellor of the university, with Nana Kobina Nketsia IV (BLitt DPhil, Oxon; Omanhene of Essikado) as the interim vice-chancellor (University of Ghana History, 2015).

#### 3.3.1 Mission Statement

The mission of the University of Ghana is to develop world-class human resources and capabilities to meet national development needs and global challenges through quality teaching, learning, research and knowledge dissemination (University of Ghana, 2015).

#### 3.3.2 Academics

UG has four colleges: College of Health Sciences, College of Basic and Applied Sciences, College of Humanities and College of Education (University of Ghana, 2015). The College of Health Sciences currently constitutes five Schools: Medicine and Dentistry, Public Health, Nursing, Pharmacy, Biomedical and Allied Health Sciences and Noguchi Memorial Institute for Medical Research, as well as the Centre for Tropical, Clinical Pharmacology and Therapeutics. The College of Basic and Applied Sciences comprises four schools: Physical and Mathematical Sciences, Agriculture, Engineering and Veterinary Medicine and Institute of Applied Sciences and Technology including four Centres: Biotechnology Research, West Africa Centre for Crop Improvement, West Africa Centre for Cell Biology of Infectious Pathogens.

The College of Humanities also consists of six schools: Business, Law, Arts, Languages, Social Sciences and Performing Arts and three institutes: Statistical, Social and Economic Research, African Studies, Population Studies, including five Centres: Social Policy Studies, Migration Studies, International Affairs and Diplomacy, Gender Studies and Advocacy, Language and University of Ghana City Campus. Finally, the College of Education comprises three schools: Information and Communication Studies, Education and Leadership and Continuing and Distance Education (http://www.ug.edu.gh/academics/overview).

### 3.3.3 Staffing and Student Population

The university has total staff strength of 4,892, consisting of:

- Senior members engaged in research and teaching : 947
- Senior administrative and professional members : 142
- Senior staff : 1,319
- Junior Staff : 2,583

(UG Vice Chancellor's Annual Report, 2015).

With a current (2015) student population of 38,831 (with a male/female ratio of about 1.3:1) the University of Ghana is the oldest and largest of the six public Universities in Ghana. The total number of students includes 5,309 at the Accra City Campus and 6,633 undertaking their studies through distance learning. Also included in this number are 5,110 post-graduate students and 980 students on modular or sandwich programmes.

### 3.3.4 Affiliations and Partnerships

There are 22 local institutes that hold affiliation with UG for the purpose of enrolment, teaching and awarding of degrees and diplomas of the university. These affiliations cover non-degree, bachelor's degree and post-graduate degree programmes (Handbook on graduate studies, 2015). UG is a member of the International Association of Universities (IAU), the Association of Commonwealth Universities (ACU) and the Association of African Universities (AAU). The university is also a member of the League of World Universities (which comprises 47 renowned research universities all over the world). The university has also established academic and research

links with several universities and research institutions worldwide, such as the Norwegian Universities' Committee for Development Research and Education (NUFU), the Council for International Educational Exchange (CIEE), among others (University of Ghana, 2015).

## 3.4 University of Professional Studies, Accra

The University of Professional Studies, Accra (UPSA), is the foremost and still the only public institution with the mandate to offer both academic degrees and provide training for higher professional education in Ghana. The university was founded in 1965 as a private professional business education tuition provider and was taken over by the government in 1978. It was subsequently transformed into a tertiary institution with a mandate to provide tertiary and professional education in the academic disciplines of accountancy, management and other related areas of study in 1999**.**It received a Presidential Charter in September 2008 to operate as a fully-fledged public university to offer undergraduate and master's degrees in several programmes (Institute of Professional Studies, 2011).

### 3.4.1 Mission and Vision Statement

The mission of the UPSA is to strive to provide and promote quality professional education and training in Accounting, Financial Management and Marketing (UPSA, 2015).

UPSA's vision is to be a world-class education provider in both academic and professional disciplines, nationally entrenched, regionally recognised and globally relevant. In achieving this, its mission is to strive to provide and promote higher professional education and training in business and other social sciences related disciplines by leveraging a structured mix of scholarship with professionalism in Ghana and beyond (UPSA, 2015).

### 3.4.2 Academics

The UPSA offers a wide range of programmes that are specially designed to meet both the academic and professional needs of the public and private sectors of the economy. The curriculum places a considerable emphasis on the development and use of analytic skills in problem-solving, decision-making and implementation. The academic programmes of the UPSA are centred on the Faculty of Accounting and Finance; Faculty of Management; Faculty of Communication Studies;

School of Research and Graduate Studies; Distance Learning; Weekend and Evening School; and the Institute of Professional Studies (University of Professional Studies, 2015).

The Faculty of Communications Studies has two departments, namely, the Department of Public Relations Management Studies and the Department of Information Technology Management Studies. The Faculty of Management has two departments, namely the Departments of Business Administration and Marketing. The Institute of Professional Studies (IPS) is mandated is to carry out continuing professional education, consultancies and other income generating activities relevant to education and training (UPSA, 2015).

The distance learning school was established to serve as a virtual life-long learning centre to meet the diverse needs of non-traditional and off-campus learning. The School of Research and Graduate Studies was established to provide higher level business education that is responsive to societal needs and prepares graduates to creatively and critically apply knowledge and skills for economic and social improvement. The main objective of the weekend and evening schools of the UPSA is to make the academic programmes of the university more accessible to a greater number of students and make optimal use of the facilities of the university (UPSA, 2015).

### 3.4.3 Staffing and Student Population

Currently, a little over ten thousand (10,000) students from all walks of life are studying various programmes (diploma, undergraduate, graduate and professional) at UPSA (UPSA, 2015).

The university has total staff strength of 487, consisting of:

- Senior academic members : 171
- Senior non-academic members: 91
- Senior staff : 101
- Junior staff : 124 (UPSA, 2015).

### 3.4.4 Collaboration and Partnerships

The university is currently a member of the International Association of Universities (IAU), International Association of University Presidents (IAUP), the International Association of

Commonwealth Universities (ACU), the Association of African Universities (AAU), Illorin University and the Bordeaux Management School. Additionally, the university is exploring the possibility of establishing more links with several other universities and research institutions worldwide, including the Norwegian Universities' Committee for Development Research and Education (NUFU), the Council for International Educational Exchange (CIEE), International Student Exchange Programs (ISEP) and the Commonwealth Universities Student Exchange Consortium (CUSAC).

### 3.5 Ghana Technology University College (GTUC)

This college has its roots in Ghana Telecom's flagship training centre, which was one of a kind in West Africa. It was first used as a Royal Air Force (RAF) Training School during the Second World War and, subsequently, handed over to Cable and Wireless to train Telecommunications Technicians for British West African Countries (ie: Ghana, Nigeria, Sierra Leone and Gambia). In 2005, Ghana Telecom's management upgraded the infrastructure and equipment to modern standards in preparation of converting the training centre into a university for telecommunication and multimedia engineering and information technology. On 30 March 2006, the GTUC was given accreditation and registered as a tertiary institution in Ghana (Ghana Technology University College History, 2014).

#### 3.5.1 Vision and Mission Statement

The GTUC's vision is to be a centre of academic excellence providing training in technology-oriented education to meet the needs of Ghana and the sub-region.

Its mission is to be a centre of excellence in education, research, teaching, intellectual creativity and innovation. The university seeks to promote relevant cutting-edge technology, leadership development and an enterprise culture to enhance the delivery of value to its customers and stakeholders.

#### 3.5.2 Academics

The GTUC is fundamentally structured into schools and faculties: engineering (computer, telecommunication); informatics (information technology, informatics, mobile internet

communication); IT business (accounting, banking and finance, human resource and marketing). There are also academic centres, a study abroad centre, centre for professional development, accelerated certificate programme centre and language centre. The university currently has a student population of over 8,000 who are pursuing nine undergraduate and 15 postgraduate (masters and doctoral) programmes. The academic programmes are offered on all their five campuses (Accra, Ho, Kumasi, Takoradi & Koforidua) (GTUC, 2015).

The GTUC has set up an e-learning system/portal and multimedia centres. The system was developed for use by students and staff of the GTUC. It aims to supplement the teaching and learning process and to automate academic activities to all possible extents. The e-learning system of GTUC serves as a course management, forum, assignment, discussion, e-library and interactive platform for both students and lecturers.

### 3.5.3 Staffing

The university has total staff strength of 251, consisting of:

- Senior academic members : 132
- Senior non-academic members: 49
- Senior staff : 29
- Junior staff : 41.

### 3.5.4 Partnership

The GTUC has established working and mutually beneficial partnerships with over 20 institutions and universities all over the world. These institutions include Coventry University in the UK, Kwame Nkrumah University of Science and Technology (KNUST), Ghana, AFRALTI, Kenya, The Open University, United Kingdom, DePaul University, USA, Aalborg University, Denmark, Antioch University, USA, University of California, Santa Barbara, California, University of Hertfordshire, United Kingdom, Wildau Institute of Technology, Germany, among others (GTUC, 2015).

## 3.6 Conclusion

This chapter discussed the background and profile of tertiary education in Ghana and the three

universities that were selected for this study: University of Ghana, Legon; University of Professional Studies, Accra; and Ghana Technology University College, Ghana. The next chapter describes the methodology used in the research. The researcher examined and explained the various steps that were generally adopted in studying and solving a research problem.

# CHAPTER FOUR
# RESEARCH METHODOLOGY

## 4.1 Introduction

Chapter Three of this study discussed the background and profile of tertiary education in Ghana and the three universities that were selected for this study namely, University of Ghana, Legon; University of Professional Studies, Accra; and Ghana Technology University College, Ghana. This chapter of the study, Chapter Four, describes the methodology used in the research. Research methodology defines the systematic scientific procedures used to arrive at the results and findings for a study against which claims for knowledge are evaluated (Saunders, Lewis & Thornhill, 2007). In it, the researcher examines and explains the various steps that are generally adopted in studying and solving a research problem. It is an effective aid towards solving social and economic problems.

This chapter gives a review of the research methodology that was applied in this study and justifies the use of the applied research approach and design. It describes the various procedures and processes that were employed to collect and analyse the data and also explains the population as well as sampling procedures used for the study. Data collection instruments that were used, together with an explanation of why they were deemed appropriate, are also discussed. Similarly, procedures used to analyse data are also discussed.

## 4.2 Research Approach

The design of a study starts with the selection of a topic and an approach. Creswell (2008:3) identifies three main types of research approaches: qualitative, quantitative and mixed method. The mixed method approach was used in this study. According to Johnson et al. (2007), the mixed research method is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g. use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the purposes of breadth and depth of understanding and corroboration.

### 4.2.1 Justification for the Use of Mixed Research Approach

This study was conducted at the University of Ghana, Legon; University of Professional Studies, Accra; and Ghana Technology University College. Several authors, including Creswell (2008), Denzin and Lincoln (2003), Onwuegbuzie, Slate and Leech (2004:786), Creswell and Clark (2007) and Ngulube et al. (2009:109) justify the use of the mixed methods research approach in that it embraces the mixing of both qualitative and quantitative data, methodologies and/or paradigms in a research study or set of related studies. These authors indicate that a researcher can make use of both qualitative and quantitative approaches to make up for the inherent weaknesses of each type. There has been continued interest in using the mixed method approach given the strengths and weaknesses found in using a single design.

The researcher took into consideration the difference between the mixed model design and mixed methods design as explained by Cameroon (2009:141). The mixed method design involves the use of both qualitative and quantitative approaches only in the methods stage of a study, while the mixed model design comprises the use of both qualitative and quantitative approaches during several stages of a study. The researcher adopted the suggestions of Creswell and Tashakkori (2007:308) and Tashakkori (2009:289) that mixed research methods must have two types of data (quantitative and qualitative) and mixed questions.

The researcher also took into consideration the following four emerging interests in the use of the mixed methods as suggested by Creswell (2003:206): the premium given to either qualitative or quantitative aspects of the study, the timing of data collection, the mixing or merging of the data and the deciding on the theoretical perspective that guides the entire design.

The researcher started with the collection of quantitative data in order to guarantee that the qualitative instruments (interview) were used to find answers to pertinent questions and issues that were insufficiently addressed in the responses to the questionnaires. As Creswell (2008) puts it, the mixed method research approach helps to answer questions that cannot be answered by either the quantitative or the qualitative approach alone. The quantitative approach was used to ask all participants identical questions in the same order. In some cases, priority was given to the interview (qualitative approach) because the researcher was dealing directly with the respondents. This gave

the researcher the opportunity to probe for further answers that were provided by the interviewees during the interview process. The use of the qualitative research approach in this study helped to collect data by means of interview. It allowed the participants the opportunity to give their own views, stories and understanding as far as KM practices and usage in the universities are concerned.

The use of the mixed research for this study is justified because, as Cooper and Schindler (2011) indicates, it increases the perceived quality of the research, especially when the qualitative study follows the quantitative one and provides a validation for the findings. The mixed method research enabled the researcher to integrate the two forms of data by having one (qualitative) build on the other (quantitative). By combining both approaches for this study, the researcher was able to overcome or minimise the limitations, weaknesses and biases of the individual approaches.

However, some researchers have raised concerns about the use and interpretation to the concept of mixed methods research, especially when it comes to data validation, sampling and merging of data. Despite the concerns, the mixed methods research remains the most suitable research approach for this study (Fidel, 2008:267).

### 4.3 Research Design

Several research designs exist, amongst others, grounded theory, experiment, action research, case study, ethnographic study, archival research and survey research (Cooper & Schindler, 2011:139). The survey research design was used in this study. Survey research involves the collection of data from a sample of individuals through their responses to questions by using a questionnaire, interview and/or observation (Cooper & Schindler, 2011:142). According to Powell (1997), the survey research is suitable for studying a large number of cases, even when they are geographically dispersed. It may include several different individuals, things, or people not studied in as much detail for a longer period. The choice of the survey research design for this study was influenced by three conditions:

1. The type of research questions posed
2. The extent of control the researcher has over actual behavioural events
3. The focus on contemporary as opposed to historical events (Yin, 2003)

The use of the survey strategy in this study enabled the researcher to gain in-depth information from a wide number of respondents from the selected Ghanaian universities. Similarly, it enabled the researcher to gather data from a sample of faculty members and senior administrative staff (library, registry and ICT staff), using and sharing knowledge with other members through the KM systems.

Furthermore, since cross-population generalisability is a key concern of this study, the survey was deemed the ideal choice. As Creswell (2008) states, the consistency of a relationship can be examined across the various subgroups when survey research is used in a study. The survey research provides a quick, efficient, convenient and accurate means of accessing data from respondents, as evident in this study. Due to the high representation of survey research, it was easier for the researcher to statistically find significant results than it would have been with other research designs. In addition, the anonymity of respondents in surveys allowed the respondents to give more candid and valid answers. It provided an avenue for more honest and unambiguous responses than other types of research designs.

The researcher therefore made use of the survey research since the study involved a large population and covered a geographically dispersed population. The selected participants were, however, considered as one unit for the purpose of analysis.

## 4.4 Data Collection and Analysis

Before data collection, the researcher needed to plan and identify the data collection instruments, how to analyse the collected data, identify the population for the study and the sampling size. The researcher took into consideration the assertion by Cooper and Schindler (2011) that an inappropriate data collection instrument can lead to the collection of inaccurate data, which can then have a negative impact on the results of a study and can ultimately lead to invalid results. Cooper and Schindler (2011:320) argue that a research instrument is a tool used to collect data. An instrument is a tool designed to measure knowledge attitude and skills.

Data was collected from both primary and secondary sources using varied data collection instruments. Primary data was collected with the use of a questionnaire and interview instruments.

Secondary data, which refers to existing literature or information on the subject area, was collected from libraries, information centres, archives, websites, databases, journals and internet sources.

### 4.4.1 Survey Data Collection Instrument (Questionnaire)

A questionnaire is a research instrument consisting of a series of questions and other prompts for the purpose of gathering information from respondents (Saunders et al., 2007:608). Questionnaires can either be open-ended, closed-ended, or mixed (blend of closed and open-ended questions). In this study, both closed- and open-ended questions were used.

#### 4.4.1.1 Closed-ended Questionnaire

Closed-ended questionnaires consist of questions that restrict respondents to select or pick from a list of available or proposed choices of responses. The majority of the closed-ended questions found in the questionnaires used for this study consisted of a five-point structured pre-coded Likert-type ordinal/interval scale, which was presented as: Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree. In addition, some of the closed-ended questions consist of three-point structures pre-coded Likert-type ordinal/interval scale, which was presented as: Agree/Yes, Neutral/Unaware, Disagree/No. The questions asked were mainly geared towards meeting the objectives of the study and helped to answer the research questions of this study.

A major advantage of the five-point pre-coded Likert scaling is that during analysis, the researcher was able to compile the group on the total pool of items (Strongly Agree and Agree) with respondents with the lowest score (Disagree and Strongly Disagree) while eliminating the middle group (neutral) whose attitude may be inconsistent or unclear. Likert pre-coded scaling was adopted because:

- it is an important and popular tool for measuring a large number of factor variables that are very closely related to each other
- it is the best with regard to measuring opinions, perceptions, beliefs and attitude
- the scale can be used as an interval scale to allow for data transformation
- it allows finer discriminations to be done between the measured factors
- it takes the minimum of participants' time to answer
- it facilitates easy and direct data entry for analysis of data

- data can be transformed for statistical use in a computer programme i.e. SPSS (Rose, 2005).

While the Likert scale offered various advantages, the researcher was conscious of the restrictions this type of scale could cause in practice. These limitations have been summed up by Rees (1997) as follows: it is recognised that while Likert scales have a limited application to statistics, they do at least permit a numerical classification to be attached to an ordered set of variables. However, there is little scope to reflect any weighting between variables.

Despite this limitation, the advantages of using the Likert scale outweighed other scaling techniques as suggested by Cho and Fellows (2000). Additionally, this technique has been used in numerous research projects such as information science, information management, KM and library science.

#### 4.4.1.2 Open-ended Questionnaire

Open-ended questions require the respondents to use their own words when giving responses. The open-ended questions in this study were designed to permit free responses from participants rather than limit participants to specific alternatives. This type of question helped to avoid bias that a list of responses could have introduced; yielded rich and detailed comments and gave the respondents the opportunity to answer in detail and to qualify and clarify possible responses. This helped the researcher to discover unanticipated findings; permitted creativity, self-expression and richness of detail; and revealed the respondents' logic, thinking processes and frame of reference (Creswell, 2008).

#### 4.4.1.3 Structure and Length of the Questionnaire

In setting the questions for the questionnaire in this study, the researcher made a conscious effort to avoid setting questions that would be unnecessarily long which might have resulted in inaccurate responses (Powell, 2000). In doing so, the researcher followed the guidelines laid by Leedy and Ormrod (2005:191) in setting the questions for this study. That is: keep it short; use simple, clear and unambiguous language; check for consistency; determine in advance how you will code the responses; provide clear instructions; make the questionnaire attractive and professional-looking; conduct a pilot test; and questions should meet the research objectives of the study.

#### 4.4.1.4 Pilot Study

While developing the questionnaire for this study, the researcher took into consideration the assertion by Powell and Connaway (2004) that it is essential to conduct a pre-test or pilot study of the questionnaire after it has been informally evaluated in order to refine the questions. Ideally, the pre-test sample should be scientifically selected, in the same way and as thoroughly as the sample for the final study.

The researcher recognised the fact that the respondents were from different academic orientation and practice, such as social sciences and applied sciences for faculty and administrative members of the universities. The researcher was guided by the suggestion of Babbie and Mouton (2001:280) which states that the pre-test subjects should comprise of a representative sample although the researcher should use people to whom the questionnaire is relevant. The researcher also sought the opinion of an expert in research methods and KM to check the weaknesses in the questionnaire such as faulty scales, inadequate instructions and the face validity of the questions. As suggested by Welman and Kruger (2001:141) and Booysen (2003:140), pre-testing a questionnaire is essential and it must be conducted on a small sample. In this study 12 respondents (four from each of the three selected universities, representing two faculty members and two administrative staff members) were selected for the pre-testing of the questionnaire.

The pilot study was undertaken. As suggested by Johnson (2007), it increases the likelihood of obtaining reliable and valid measures like question wording, response categories, question ordering and questionnaire layout.

Booysen (2003:140) states that a researcher should cautiously consider all the comments and remarks of the respondents who participated in the pre-testing process. This is because they are often insightful and helpful. However, Booysen (2003:140) cautions that the researcher does not have to accept all the comments since not all the comments might be useful. The comments and weaknesses of the pre-tested questionnaires were, therefore, considered and, where appropriate, the questions were modified for the final actual data collection.

### 4.4.2 Interviews

According to Kumekpor (2002), an interview is a conversation between two or more people where questions are asked by someone (interviewer) to elicit facts or statements from the other (interviewee).Interviews could take the form of telephone, face-to-face, internet interviews and more. Interviews are either conducted in a structured, unstructured, or semi-structured format. The semi-structured interview was used in this study. A semi-structured interview is an interview that is somewhat structured, but allows for new ideas and questions to be communicated during the interview as a result of what the interviewee says. The interviewer in a semi-structured interview generally has a framework of themes to be explored (Kumekpor, 2002).

The researcher was guided by the view of Denscombe (1998) that interviewing is not an easy option and it needs good planning, proper preparation and sensitivity to complex values of the interaction taking place during the interview. The interviews for this study were conducted with the university librarians, directors of ICT and registrars of the selected universities.

As suggested by Babbie and Mouton (2001:2581), the researcher conducted the interview personally and recorded the answers of the interviewees. The researcher used the semi-structured interview guide (schedule) with a prepared list of questions and sent them to the interviewees in advance. The interview schedule was used because it provided the respondents with ample time to go through the questions before the interview was conducted. It also created a conversational partnership between the researcher and the interviewees and enabled the researcher to conduct a well-organised interview and helped to avoid repetition of questions. Furthermore, the semi-structured nature of the interview gave the researcher an opportunity to follow up on data/probes provided by the respondents, thus enabling additional information not disclosed in the questionnaire.

The interview allowed the researcher to obtain adequate and in-depth data/information, probe issues deeply and ask more, complex and sensitive questions. With the participants' permission, the researcher audiotaped the interviews. Notes were also taken throughout the interviewing process. This was compared with what was audiotaped in order to prevent possible omissions and

inconsistencies of parts of the interview process. The face-to-face technique allowed the researcher to study and analyse attitude, perceptions and motivations of the interviewees.

As with other data collection instruments, a challenge with the interview is the element of bias. This tends to affect the validity and reliability of some of the responses obtained from the interview. This was avoided by ensuring that the interviewer did not overreact to appropriate or inappropriate answers/responses.

### 4.4.3 Triangulation of Methods and Results

This study employed triangulation of methods in order to obtain reliable data and valid results. The concept of triangulation is based on the assumption that any bias inherent in a particular data source, instrument and method would be neutralised when used in conjunction with other data source(s) (Creswell, 2008).The combination of these instruments enabled the strengths of one method to counteract the weaknesses of the other and it helped to check the validity of the findings and to generate a rich profile on KM systems in the Ghanaian universities.

In addition, the researcher triangulated the data collection instruments and found that they complemented each other. The idea of combining them in a single study owes much to the past discussions about mixing methods (quantitative and qualitative), linking approaches and combining research designs in all phases of the study. The triangulation was not just done to compare and contrast results, but also to obtain a rich set of data, thus enabling the researcher to develop complete and well-substantiated conclusions about the impact of the KM systems and strategies on the universities.

### 4.4.4 Secondary Data Sources

The researcher collected secondary data from books (hardcopy and digital), online and printed journals and internet databases by making use of appropriate search terms. The use of secondary data was significant for this study as it provided relevant background information that was used during the development of a KM strategy and KM impact on Ghanaian Universities. The secondary data was used as supplementing information sources providing background information that

informed the design of the questionnaire and interview schedule. They were also used to provide information on KM strategies and critical success factors of KM implementation.

### 4.4.5 Data Analysis

Data analysis implies identifying and agreeing on criteria and action, which can be used to explain what has happened. The aim of data analysis is to transform the data collected into meaningful information or to answer the research questions (Johnson & Christensen, 2008: 500; Creswell, 2008). Results derived from the data analysis lead to the development of theories and models that contribute to the enhancement or establishment of new theories and knowledge.

Since the researcher employed a mixed research approach to data collection, both the questionnaires and interviews were analysed using the mixed analysis technique. According to Onwuegbuzie and Collins (2007:5), the essential principle of a mixed analysis technique involves the use of qualitative and quantitative analytical techniques that are utilised used concurrently or sequentially, after the data collection process from which interpretations are made either in a parallel, integrated, or iterative manner.

#### 4.4.5.1 Survey Data Analysis

In this study, the survey data analysis went through three main stages. The first stage was the data preparation. It involved organising, piling up and sorting the data. By preparing the data, it became an "intelligible product" for the researcher to read, edit for accuracy, comment on, code and analyse.

The second stage was the analysis itself. The researcher analysed the data by coding the refined (prepared) data. The coding involved two main stages. The first stage was to extract the codes and terms the respondents themselves use from the data. The coding provided a platform for ascertaining similar patterns from the responses given in the questionnaire. Subsequently, the collected questionnaires were checked for inaccuracies in responses as well as identifying unanswered questions before entering it into the SPSS software. Advanced analysis was used in the emergence of patterns, trends and themes. During data analysis, the researcher looked for instances to support or challenge the initial theoretical framework of the study. Descriptive

statistics were presented in the form of tables, pie charts, histograms, frequency distribution and percentages were used. The tables, charts and graphs were used to ensure easy understanding of the analysis. The frequency distribution percentage was also used to determine the percentage of respondents selecting the various responses. The proportion/percentage showed the various views of respondents on the issues raised in the questionnaires.

The final stage was data interpretation. Here, the data were given meanings and the focus was on expressing what was learnt through the research. Information from the data analysis and interpretation was summarised and conclusion/recommendations were made.

#### 4.4.5.2 Interview Data Analysis

In collecting data using the interview, the researcher took notes and used a recorder to record the interview sessions. The main modes of qualitative data analysis employed in this study were pattern-matching and explanation-building (Babbie & Mouton, 2001). The qualitative analysis for this study started with sorting and arranging the data obtained from the interviews. The recorded interview data was transcribed, analysed and coded into categories.

Transcription of recorded interview was done for sections that were identified to be crucial for the study. The transcription complemented the hand-written notes during the interview sessions. Incidents and concepts were broken down, sorted and compared to identify similarities and differences in a process referred to as "open coding". The researcher then compared the recorded data with the researcher's notes taken during the interview process to scan for possible omissions or additions. The data was subsequently integrated using the thematic content analysis technique.

Content analysis was applied where the researcher read all the transcripts in order to identify themes. The process of content analysis involves continually revisiting the data and reviewing the categorisation of data until the researcher is sure that the themes and categories used to summarise and describe the findings are a true and accurate reflection of the data. Patterns were assessed to identify common attributes, which largely helped in making meaning out of the data.

The data analysis of the transcribed data was entered into a database after the recording, transcription and coding as suggested by Anderson (1998:64–96). This was followed with cleaning of data. This enabled the researcher to identify some of the common and visible mistakes and correct them accordingly.

## 4.5 Population and Sampling

Researchers in the early 19th century strove to survey the entire population. However, researchers in the 21st century work only with a portion of the entire population (a sample) from which the researcher draws inferences about the population or generalises the result (Creswell, 2010). This section dwells on the population and sampling strategies adopted in this study.

### 4.5.1 Population

In research, population refers to an identified group of interest to the researcher; the group to which the research results would be generalised (Saunders et al., 2007:206; Jonhson & Christensen, 2008: 224). It is composed of two groups, namely: target population and accessible population. The target population is the entire group of people or object to which the researcher wishes to generalise the study findings whiles the accessible population is the portion of the population to which the researcher has reasonable access; may be a subset of the target population. The target population for this study is the entire universities in Ghana (see Section 3.2). The accessible population for this study comprised three universities with a total staff strength of 1,337: 1,055 faculty members and 282 senior administrative staff members. These universities are: University of Ghana, Legon (752 faculty members and 142 senior administrative staff members); University of Professional Studies, Accra (171 faculty members and 91 senior administrative staff members); and Ghana Technology University College (132 faculty members and 49 senior administrative staff members). The selection of the three institutions took into consideration the need to have representation of public and private universities; autonomous and semi-autonomous universities; and technical/technological, research and professional universities. The location or accessibility and the state of the KM practice at the universities were also taken into consideration.

### 4.5.2 Sampling

Because the researcher could not study the entire population, it was important to select a sample from the population under study. The results of the study could then be generalised or contextualised. There are two main sampling strategies: probability sampling and non-probability sampling (Saunders et al., 2007:208). The probability sampling technique was used in selecting the sample from the population.

Probability sampling occurs when people constituting a sample are selected because the researcher has some notion of the probability they will represent the population being studied (Saunders et al., 2007:208). Probability sampling enhances the likelihood of accomplishing the objective of selecting elements that accurately represent the total population from which the elements were drawn. The objective is to provide a method for estimating the degree of probable success; it incorporates probability theory, which provides the basis of probability of being included. A probability sample may consist of random, systematic, stratified, quota, cluster, or multi stage sampling (Saunders et al., 2007:208; Tashakkori & Teddlie, 2003:171). Stratified sampling was used in this study.

A stratified sample is a probability sampling technique in which the researcher divides the population into different subgroups or strata and then randomly selects the final subjects proportionally from different strata (Creswell, 2008). The researcher used the stratified sampling technique to divide the population into two strata, which consisted of faculty members and senior administrative staff.

The study adopted a two-stage sampling strategy to ensure adequate representatives from both the faculty and administration. In the first stage, all the faculty members and senior administrative staff members from the three universities were selected to partake in the study. In the second stage, from each university, the library, ICT directorate and registry represented the senior administrative strata while four academic departments were selected (two representing the applied science discipline and two representing the social science discipline) to represent the faculty strata. These strata were selected due to the following reasons:

- The library is considered as the hub of knowledge in a university. It serves as the centre for knowledge creation, processing, storage and sharing at the universities. Furthermore, libraries and librarians are seen as custodians of knowledge.
- The ICT directorate provides the relevant technology and systems needed for KM at the universities. In addition, they serve as the technological backbone of KM at the universities.
- The registry is the central administrative unit of the universities. They coordinate almost all the activities of the universities.
- The academic departments facilitate the teaching, research and learning of the universities. They serve as the knowledge creators and share the knowledge created through the implemented KM systems.

#### 4.5.2.1 Sample Size

An essential issue in sampling is to determine the most suitable size of sample. While a large sample size may be more representative but costly, a small sample size may be convenient but less accurate (Bless and Higson-Smith 2000:96). The sampling size determines the validity and reliability of most research findings and conclusions (Ngulube, 2005). Alreck and Settle (1985), Seaberg (1988), Neuman (2000:217), Grinnell (2001), Grinnel and Unrau (2004) suggest that a 10% sample size, especially for a large population, is good enough to draw valid and reliable data. Cochran (1963) also suggests an additional 10 percent error margin of a sample size to be added to the sample. This represents 11 percent of the total population.

Therefore, a sample of 11 percent was used for this study. To this end, a total sample size of 147 participants was used in this study. The 11 percent sample size of the universities' breakdown is as follows (this is approximated to the nearest whole figure).

**Table 3.1: Summary of the proposed total respondents to be surveyed in each population group**

| **Universities** | | | | | | |
|---|---|---|---|---|---|---|
| | **Public** | | **Professional** | | **Private** | |
| | UG | | UPSA | | GTUC | |
| | Population | Sample (11%) | Population | Sample (11%) | Population | Sample (11%) |
| Faculty members | 752 | 83 | 171 | 19 | 132 | 15 |
| Senior administrative staff members | 142 | 16 | 91 | 10 | 49 | 5 |
| Total | 894 | **99** | 262 | **29** | 181 | **20** |

## 4.6 Validity and Reliability of the Research Findings

Issues of validity in research are the basis upon which the worthiness of research findings can be determined (Creswell, 2003:195). Validity measures the soundness of a research study. It is applied to both the design and the methods used in research. Validity in data collection means that the findings truly represent the phenomenon the researcher seeks to measure. Reliability is a synonym for consistency and replicability over time, over instruments and over other groups of respondents. Reliability means that a particular technique, applied repeatedly to the same object, would yield the same result each time (Cohen, et al., 2000:117).

In this study, both quantitative and qualitative data were collected and analysed. The rationale was based on the understanding of Creswell, et al. (2004) that, when integrated, both types of data become adequate to capture the trends and details of that situation and, therefore, yield a more complete analysis and they complement each other. There are different criteria used to evaluate validity and reliability in mixed method research. Brock-Utne (1996) contends that just as validity is useful in quantitative research, so is the case with qualitative research.

The researcher ensured that reliability was achieved through the use of an interview guide where the same pattern of questioning was made on each interviewee. Similarly, the questionnaire

distributed to the respondents contained the same questions. This consistency ensured that reliability of data collected was achieved.

According to Babbie, et al. (2006:122), validity in research means that an empirical measure adequately reflects the real meaning of the concept under consideration. This suggests that the research-evaluating instrument intended to measure certain elements of KM, do indeed measure those elements. In this study, the researcher first formulated the research objectives. This was followed by corresponding research questions aligned to the stated research objectives. While embarking on the research, the researcher ascertained that the research instruments in use were functioning as intended.

The researcher was guided by the assertion of Yin (2003) that validity helps to identify the extent to which inferences about causal relationships can be made or generalised to other situations or people. It serves as the interaction of causal relationships. Its major significance is the fact that the same study should generate the same results if redone, done by another individual using the same methodology and even in a different university, industry or organisation. An analytical generalisation or conceptualisation of the results must to be possible (Yin, 2003).

## 4.7 Ethical Consideration

Ethics is the branch of philosophy that comprises systematising, defending and recommending theories of right and wrong conduct. In research, ethics involves the application of essential ethical principles to a variety of research work, including scientific research. Several factors may confront researchers. This study was guided by the Unisa policy on Research Ethics (Unisa 2007:9). The researcher was guided by the assertion by Babbie and Mouton (2001:525) that the researcher has a right to search for truth, but not at the expense of the rights of other individuals. The researcher has the right to collect data by means of interviewing people, but not at the expense of the interviewee's right to privacy.

This study was approved by the Department of Information Science of the University of South Africa (Unisa) and cleared by Unisa's Research Ethics Board before being undertaken. These processes were undertaken to ensure compliance with the Unisa Policy on Research Ethics (2007).

The policy specifies that researchers must avoid undertaking secret or classified research. In doing so, the study ensured that the following ethical dimensions was addressed to avoid diluting the research process. The following ethical issues were taken into consideration for the purpose of the study: inducement to participate, planning the research, responsibility, personal information and honesty.

**Inducement to participate:** Embedded in mixed method research are the concepts of relationships and power between participants and researchers. The wish to participate in a research study depends on a participant's preparedness to share his or her knowledge. Individual's participation in this study was given without restraint and based on informed consent. Direct or indirect compulsion, as well as undue inducement of participants in the name of research, where avoided. The researcher informed participants of the purpose of the study and the study participants were advised that participation in the study is voluntary.

**Planning the research:** The researcher drafted and properly executed a research plan to avoid reporting of misleading results. Steps were also taken to protect and ensure the dignity of participants as well as those that could be affected by the results of the study.

**Responsibility:** According to Unisa (2007), researchers need to maintain the dignity and welfare of their participants. This entails protecting participants from harm, unnecessary risks and mental or physical discomfort that may be inherent in the research procedure. The researcher ensured that participants' dignity and anonymity were protected. Interviews were conducted in safe environments.

**Personal information:** The researcher was guided by the assertion by Esterberg (2002:53–54) that the researcher should ensure that the participants in the study are duly protected in terms of confidentiality during the process of data collection, analysis and publishing of the theses or when disseminating the outcomes of the study. It is also advisable for the researcher to protect the names of the participants and the institution or community that is being researched. The researcher ensured that participants' personal information was not discussed with any third parties. During data collection, participants were advised not to write their names on the questionnaires.

**Honesty:** The research was conducted in an honest, fair and transparent manner and the participants were informed of the purpose and benefits of the study. The participants will be randomly selected (to eliminate favouritism) when the questionnaires are sent out.

## 4.8 Summary of Chapter Four

This chapter presented the various research methodologies that were applied in carrying out the research in order to meet the objectives of the study. The research approach and design, data collection instruments, data analysis, population and sampling techniques were discussed. The researcher adopted the survey research method for this study due to the large and geographically dispersed population involved in the study. The mixed methods research approach was adopted for this study, because it ensured the accuracy of the research findings and helped to meet the objectives of the study.

In this the data collection techniques (questionnaire and interview) and data analysis method that were used for this study and the justification for selecting these techniques were also discussed. The researcher adopted the probability (stratified) sampling methods in sampling the population for the study. The next chapter, Chapter Five presents the results of the data obtained from the questionnaires administered and interviews conducted for this study.

# CHAPTER FIVE
# DATA PRESENTATION AND ANALYSIS

## 5.1 Introduction

Wilkinson (2000:78) stipulates that before analysing data, it must be categorised or coded in some way. This chapter presents the results of the data obtained from questionnaires administered, as well as interviews conducted for this study. The presentation of the collected data is based on the previously stated objectives of the study. The result is presented in the form of data reduction, display and transformation.

In the context of this study, content analysis was used to examine all the categories that the data comprised, it also condensed the data into smaller categories, as such, data with analogous meanings or connotations were congregated together, which enabled the researcher to create codes for them. According to Matthews and Ross (2010:395), content analysis looks for the occurrence of words/phrases or concepts in a text and endeavours to comprehend their meanings and relationships to each other. Content analysis, at this stage, enabled the researcher to identify and discover patterns in the data, which helped to understand the impact of KM systems on Ghanaian universities. The researcher was principally interested in patterns of data which addressed the stated research objectives and questions.

The survey method was used to operationalise the main variables of which the respondents were asked to give their views. Once the data codes were created, the researcher converted the questionnaire responses into a numeric form as suggested by Miles and Huberman (1994:429) and Wilkinson (2000). This helped to present the data as an organised, compressed assembly of information that permits conclusion, drawing and/or action taking. This was done with the aid of SPSS and Microsoft Excel 2010. Next, the findings were displayed in pie charts, tables and bar graphs, this was also in line with the views of Onwuegbuzie and Teddlie (2003), who posit that analysis refers to reducing quantitative data into tables and graphs and qualitative data into matrices, charts and graphs. In addition, the displaying of data conformed to the association of multi-methods research with data that is displayed in diagrammatic, pictorial or visual forms in order to show what the data imply.

## 5.2 Presentation of Survey Findings

The questionnaire distribution and retrieval to the sampled respondents of the universities took place from 3 August 2015 to 11 September 2015. Many researchers presume that higher response rates assure more accurate survey results (Holbrook, et al., 2007; Choung,, et al., 2013), thus, the response rate that every researcher should pursue is 100%, in reality, few researchers enjoy such a high figure. By the third week of data collection (21 August 2015), a total of 63 out of the 147 distributed questionnaires (42.86%) were retrieved from the respondents. By the end of the data collection period (11 September 2015), a total of 118 (80.27%) of the distributed questionnaires were retrieved. The response rate of 80.27% is consistent with the findings of Babbie (2010), Christiaanse and Venkatramen (2002) and Dennis (2003), who find that a response rate usually centring on 70% to 80% and above for survey research was superb and should be the standard for survey research. Similarly, Evans (1991) states that getting a high response rate of more than 80% from a small, random sample is preferable to a low response rate from a large sample.

Although the general response rate was high, UPSA and GTUC had the highest return of 93% and 90% respectively, while UG had 73.73%. The average response rate for the senior administrative staff (87.10%) was also higher than that of faculty members (78.45%). The researcher's position as a former student and staff member of UG, former lecturer at GTUC, a practicing librarian and knowledge manager, as well as his experience and knowledge in research and data collection could have contributed to a high response rate. The respondents also could have felt that questions asked were purely for academic and knowledge creation to aid the successful implementation of KM systems and strategies in Ghanaian universities.

The findings were presented in two main segments: quantitative and qualitative findings. The presentation of the quantitative findings was based on the previously stated objectives of the study. However, the researcher preceded it with the demographic information of the respondents. The specific objectives of the study, in relation to universities, were to:

- Identify the types of knowledge created, shared and used.
- Assess the KM processes (creation, capturing, retention and sharing).
- Assess the KM enablers (leadership, culture, technology and strategy).

- Determine the adopted strategies to promote and safeguard knowledge.
- Assess the KM system and facilities.
- Assess the impact of KM systems.
- Determine the critical success factors and inhibitors to the effectiveness and successful implementation of KM systems.
- Develop a framework for the successful Implementation of KM systems.

### 5.2.1 Demographic Information of the Respondents

Arising from the first section, the researcher sought to establish the demographic variables of the respondents, namely: status (job title), ages, academic qualification and work experience.

#### 5.2.1.1 Status (Job Title) of Respondents

The study surveyed the job titles of the respondents as this might have a bearing on KM. Responses to the survey questions on KM can, to a large extent, be influenced by the occupations and status of the respondents. Considering the nature of this study, the faculty members and senior administrative staff from the libraries, ICT directorates and registries of the selected universities were deemed appropriate, because they are involved in knowledge production and management at the universities. For one to be a faculty member and senior administrative staff member, they must have, not only, acquired certain academic qualifications, but must also have been involved in knowledge creation and management through teaching, research, publishing, information and knowledge delivery, system/knowledge base management, records management and so on. The results showed that 91 (77.12%) of the respondents were faculty members while 27 (22.88%) were senior administrative officers. At the individual university level, UG, UPSA and GTUC had 61 (83.56%), 17 (62.96%) and 13 (72.22%) respondents as faculty members respectively and 12 (16.44%), 10 (37.04%) and 5 (27.78%) as senior administrative staff respectively.

**Table 5.1: Status (job title) of respondents**

| Status of the respondents | UG | | UPSA | | GTUC | | NET | |
|---|---|---|---|---|---|---|---|---|
| | **N** | **%** | **N** | **%** | **N** | **%** | **N** | **%** |
| Faculty | 61 | 83.56 | 17 | 62.96 | 13 | 72.22 | 91 | 77.12 |
| Senior Administrative Staff | 12 | 16.44 | 10 | 37.04 | 5 | 27.78 | 27 | 22.88 |
| **Total** | **73** | **100** | **27** | **100** | **18** | **100** | **118** | **100** |

Source: Field data (2015).

### 5.2.1.2 Age Demography of Respondents

Out of the 118 respondents from all the universities, 13 (11.02%) were younger than 30 years, 53 (44.92%) between 30-39 years, 34 (28.81%) between 40-49 years, 14 (11.86%) between 50-59 years and 4 (3.39%) above 60 years. Universities all over the world face retirement of its key knowledge experts, which calls for a balance between new recruits and outgoing staff. Over 96% of the respondents were aged below 60 years. That means the universities have most of their staff in active service and are able to effectively create and manage knowledge. KM should take care of knowledge transfer within these groups.

### 5.2.1.3 Educational Demography of the Respondents

Appreciating and managing knowledge is, to a large extent, influenced by the educational background of the respondent. Universities have members with qualifications and educational backgrounds that enable them to manage knowledge effectively. Ismail and Yusof (2009:2) state that the lower the level of education, the more likely persons are to refuse to appreciate and share knowledge. The respondents were therefore required to indicate their highest qualification, while provisions were made for other qualifications.

The majority of the respondents (55.08%) obtained a master's degree, 37 (31.36%) a Doctoral degree, 12 (10.17%) a Bachelor's degree and 4 (3.39%) had other qualifications such as Association of Certified Chartered Accountants (ACCA), Association of Chartered Accountants in Ghana (ACAG), Chartered Institute of Marketing (CIM), Chartered Institute of Management Accountants (CIMA)and so on.

**Table 5.2: Educational demography of the respondents.**

| Highest level of education | UG | | UPSA | | GTUC | | Net respondents | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| Bachelor | 7 | 9.59 | 4 | 14.81 | 1 | 5.56 | **12** | **10.17** |
| Masters | 36 | 49.32 | 17 | 62.96 | 12 | 66.67 | **65** | **55.08** |
| Doctoral | 29 | 39.72 | 4 | 14.81 | 4 | 22.22 | **37** | **31.36** |
| Others | 1 | 1.369 | 2 | 7.41 | 1 | 5.56 | **4** | **3.39** |
| **Total** | **73** | **100** | **27** | **100** | **18** | **100** | **118** | **100** |

Source: Field data (2015).

These advancements in education will be more vital if the universities implement a KM system, as its employees have gained more knowledge and, if shared, will increase the knowledge base of the universities. It can be concluded from the results that, since the respondents had well progressed in their education and have obtained the relevant qualification, they should be able to have an understanding and appreciation of KM and, hence, provide reliable data on KM systems.

### 5.2.2 Categories/Types of Knowledge Available at the Universities

One of the principal objectives of the study was to find out what categories/types of knowledge were available at the universities. However, the researcher, firstly sought to establish the respondents' level of understanding and familiarity of the concept of knowledge and KM. The survey showed that 101 (85.59%) of the respondents indicated that they were familiar with the concept of KM and while 13 (11.02%) of the respondents disagreed, none strongly disagreed, the rest (3.39%) were neutral. Though the majority responded affirmatively, 94.44% of the respondents from GTUC (44.44% strongly agreed and 50% agreed) were more familiar with the concept of KM, followed by UPSA (85.19%: 29.63% strongly agreed and 55.56% agreed) and UG (83.56%: 30.14% strongly agreed and 53.42% agreed).

Additionally, the respondents were asked to identify the categories/types of knowledge present in the universities, 63 (53.39%) of the respondents believed that both tacit and explicit knowledge are present at the universities. Furthermore, 38 (32.21%) of the respondents indicated that only tacit knowledge is present at the universities and 17 (14.40%) said only explicit knowledge was

present at the universities. From the result, the respondents believed that GTUC (66.66%) possessed more of the tacit and explicit knowledge than UPSA (55.56%) followed by UG (49.33%) while UG (38.36%) possessed more tacit knowledge than UPSA (22.22%) and GTUC (22.22%). In addition, UPSA (22.22%) possessed more explicit knowledge than UG (12.33%) and GTUC (11.11%). This contradicts the assertion by Tiwana (2008) that tacit knowledge is the most important type of knowledge that exists in organisations, because it can be put to action, used in innovation and creative practices, thus adding value to goods and services.

**Table 5.3: Categories of knowledge at the universities**.

| **Categories of knowledge** | **Universities** | | | | | | **Net respondents** | |
|---|---|---|---|---|---|---|---|---|
| | **UG** | | **UPSA** | | **GTUC** | | | |
| | **N** | **%** | **N** | **%** | **N** | **%** | **N** | **%** |
| Tacit | 28 | 38.36 | 6 | 22.22 | 4 | 22.22 | 38 | 32.21 |
| Explicit | 9 | 12.33 | 6 | 22.22 | 2 | 11.11 | 17 | 14.40 |
| Tacit and Explicit | 36 | 49.33 | 15 | 55.56 | 12 | 66.67 | 63 | 53.39 |
| **Total** | **73** | **100** | **27** | **100** | **18** | **100** | **118** | **100** |

Source: Field data (2015).

The respondents were also asked to mention any other knowledge they think may be available at the universities. Listed is the other types of knowledge the respondents mentioned in order from the most to the least mentioned: individual/personal knowledge, group knowledge, common knowledge, corporate knowledge, embedded knowledge, embodied knowledge, procedural knowledge, descriptive knowledge and declarative knowledge.

### 5.2.3 Paying Attention to Knowledge Management Practice

In order for an organisation to harness and benefit from the power of the knowledge and information it generates, shares and uses, it needs to give attention to the generation and practice of knowledge (Naseej, 2014). Therefore, in this study, the respondents were asked to state if KM practice is given attention at the universities. As shown in figure 5.1, 42 (35.59%) of the respondents agreed, 30 (25.422%) disagreed, 25 (21.19%) were neutral, 19 (16.10%) strongly agreed and 2 (1.69%) strongly disagreed. These results, therefore, strongly suggest that KM

practice at the universities is given lot of attention (51.69%). The results further show that 61.11% of the respondents from GTUC gave more attention to KM practice (38.89% strongly agreed and 22.22% agreed) than UPSA (51.85%: 14.81% strongly agreed and 37.04% agreed), while the attention given to KM practice at UG was a little below average with 49.32% (10.96% strongly agreed and 38.36% agreed).

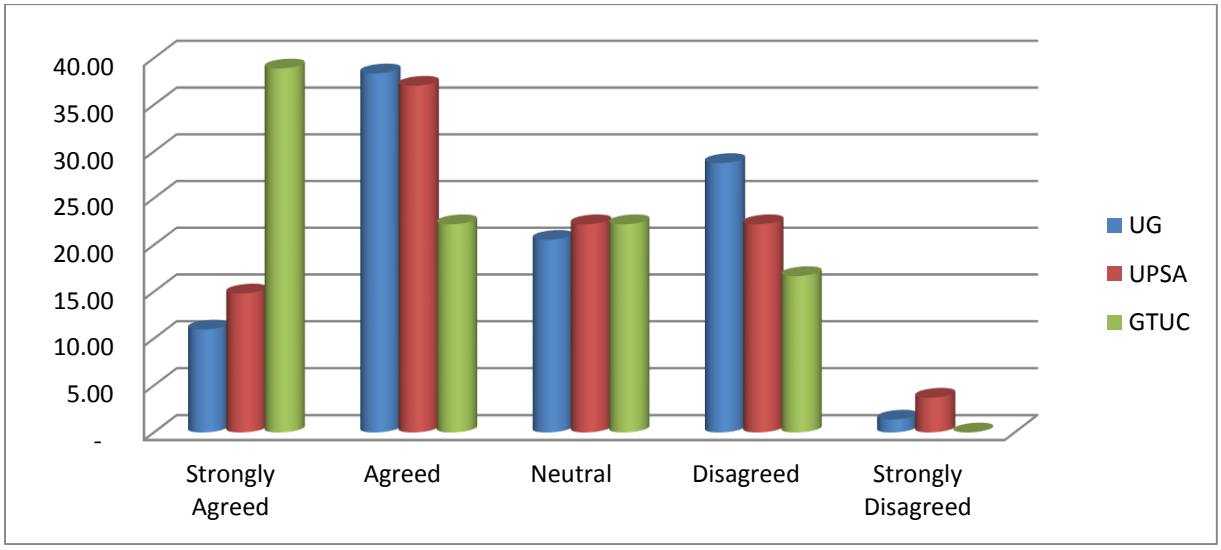


**Figure 5.1: Paying attention to KM practice**

Source: Field data (2015).

### 5.2.4 Knowledge Management Processes

The second objective of the study was to evaluate the KM process (i.e. acquisition, generation, processing, storage and dissemination) at the universities. A summary of the responses reveals that most of the respondents expressed (69%: 25% strongly agreed and 44% agreed) that there exists KM practice at the universities, 18% expressed a contrary opinion (16% disagreed and 2% strongly disagreed) and 13% were neutral. Comparatively, KM processes at GTUC were considered to be higher (76.67%: 38.89% strongly agreed and 37.78% agreed) than UPSA (69.26%: 23.70% strongly agreed and 45.56% agreed) and UG (67.26%: 21.78% strongly agreed and 45.48% agreed).while UG had the highest negative response rate of 19.04% (17.53% disagreed and 1.51% strongly disagreed) followed by UPSA (17.78%: 15.19% disagreed and 2.59% strongly disagreed) and GTUC (12.22%: 11.67% disagreed and 0.56% strongly disagreed). In addition, 13.70%,

12.96% and 11.11% respondents who took neutral position were from UG, UPSA and GTUC respectively.

### 5.2.4.1 Knowledge Creation

One of the significant missions of universities is knowledge creation. It is a self-evident function of a university and it is only after knowledge creation that knowledge can be reproduced through education and training. The creation of new knowledge and effectively exploiting the existing knowledge, is an important process in KM (Ngulube & Lwoga, 2007; Jelenic, 2011). The respondents were asked to indicate whether they contribute to the creation of knowledge at the universities, as illustrated in figure 5.2, the results show that 51 (43.22%) agreed, 30 (25.42%) were neutral, 22 (18.64%) strongly agreed, 13 (11.02%) disagreed and 2 (1.69%) strongly disagreed. These results suggest that most of the staff (61.86%) contributed to knowledge creation at the universities.

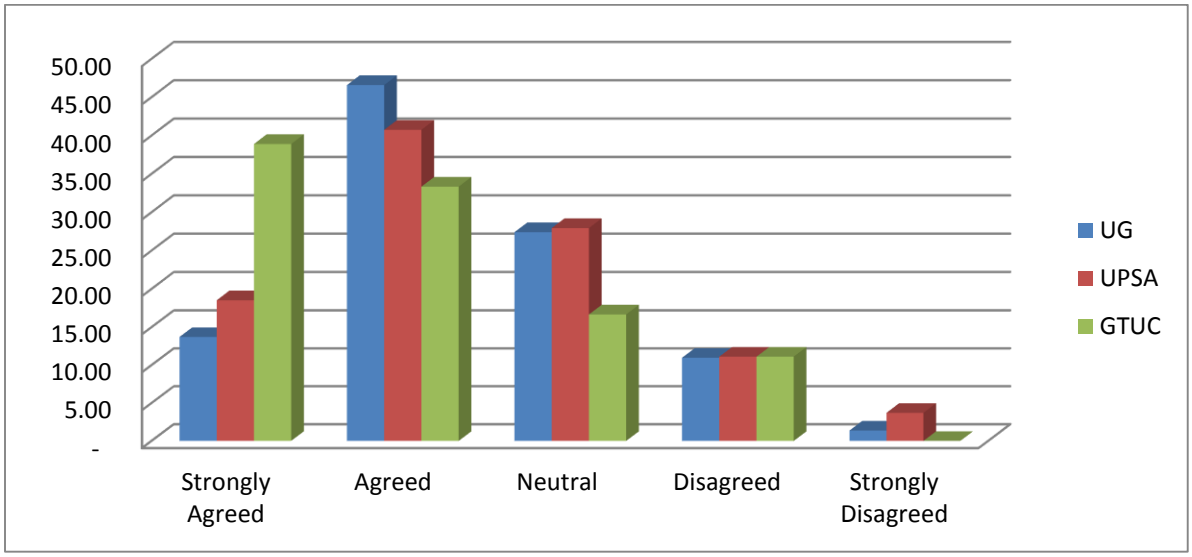


**Figure 5.2: Contribution to knowledge creation at the universities**

Source: Field data (2015).

The results further indicate that staff's contribution to knowledge at GTUC was 72.22% (38.89% strongly agreed and 33.33% agreed) while UG was 60.27% (13.70% strongly agreed and 46.58% agreed) and UPSA was 59.26% (18.52% strongly agreed and 40.75% agreed). However, 14.81% (11.11% disagreed and 3.70% strongly disagreed) of UPSA respondents, 12.33% (10.96%

disagreed and 1.37% strongly disagreed) of UG respondents and 11.11% of GTUC respondents expressed a contrary opinion, while 27.40%, 25.93% and 16.67% of UG, UPSA and GTUC respondents took neutral positions respectively. The implication in this case may be that, since many of the tasks by staff in an academic institution involve knowledge creation, the involvement of the staff in the knowledge creation process would promote KM. This result is in sharp contrast to the research findings of Anduvare (2015), which state that only 39% of the academic staff claimed to have contributed to knowledge creation at MIUC.

#### 5.2.4.2 Capturing Expert Knowledge

When discussing issues related to knowledge acquisition, it is important to bear in mind that a vast amount of knowledge is in the heads of "experts" (Davenport & Prusak, 1998; Rao, 2004). Expert knowledge plays an integral role in KM, particularly in universities (Mikulecká & Mikulecký, 2000), such knowledge could remain unused if not tapped. Among many considerations for an expert knowledge system, is the identification of experts or individuals with expert skills that justify the need for such a system to be in place. Due to this, the respondents were asked to indicate whether there are means to capture experts' knowledge while in the university. 49 (41.53%) agreed, 28 (23.73%) were neutral, 24 (20.34%) disagreed, 14 (11.86%) strongly agreed, and 3 (2.54%) strongly disagreed. The results further show that GTUC (61.11%: 16.67% strongly agreed and 44.44% agreed) was able to capture more expert knowledge than UPSA (55.56%: 11.11% strongly agreed and 44.44% agreed) and UG (50.68%: 10.96% strongly agreed and 39.73% agreed).

Conversely, 26.03% (23.29% disagreed and 2.74% strongly disagreed) of UG respondents, 22.22% (18.52% disagreed and 3.70% strongly disagreed) of UPSA respondents and 11.11% (11.11% disagreed and 0% strongly disagreed) of GTUC respondents believed the expert knowledge of staff was not captured while they were still at the university. These questions had the purpose of identifying whether the universities were able to capture expertise knowledge of staff as they carry out their activities on a daily basis and to establish if knowledge is absorbed by the universities from staff.

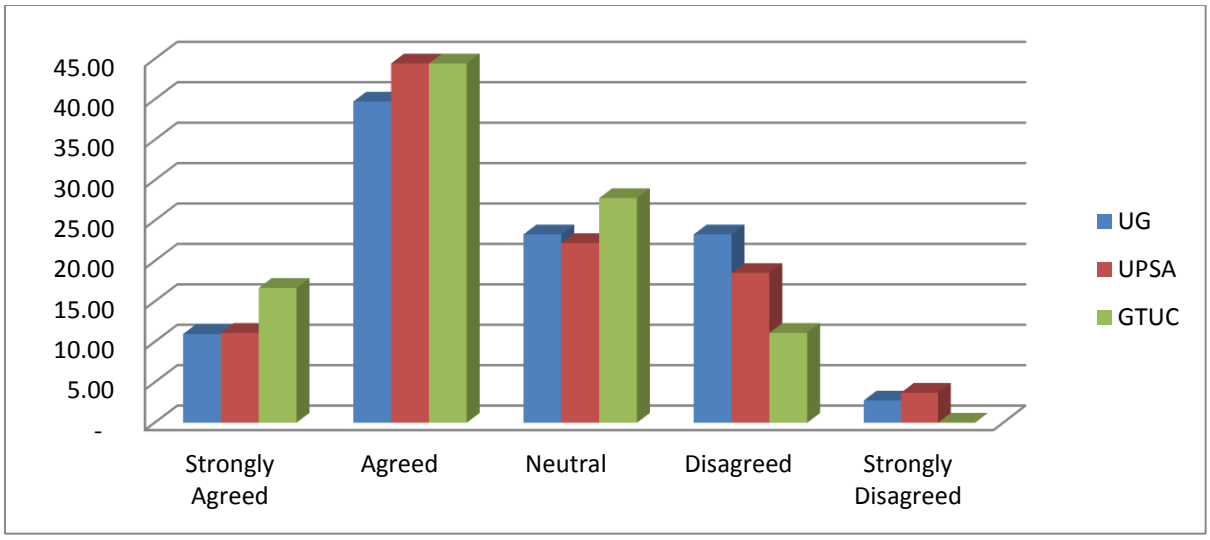


**Figure 5.3: Capturing expert knowledge**

Source: Field data (2015).

Similarly, the knowledge of experts is needed for the advantage of the universities. The respondents were asked to indicate if there are means to capture expertise knowledge when staff leave the university. The responses showed that 47 (39.83%) agreed, 33 (27.97%) were neutral, 23 (19.49%) disagreed, 12 (10.17%) strongly agreed and 3 (2.54%) strongly disagreed. The results also show that UPSA (48.15%: 7.41% strongly agreed and 40.74% agreed) trailed UG (49.32%: 9.59% strongly agreed and 39.73% agreed) and GTUC (55.56%: 16.67% strongly agreed and 38.89% agreed). However, more respondents from UG (24.66%: 21.92% disagreed and 2.74% strongly disagreed) expressed a contrary view, followed by UPSA (22.22%: 18.52% disagreed and 3.70% strongly disagreed) and GTUC (11.11% disagreed) that expert knowledge of staff was captured when exiting the universities while 33.33%, 29.63% and 26.03% of GTUC, UPSA and UG respondents took neutral positions respectively.

#### 5.2.4.3 Capturing Informal Knowledge

Learning environments are normally composed of a series of informal knowledge processes, as the learning taking place would be inefficient if placed in a strictly formal knowledge process. This means that organisations must not only support formal knowledge, through faster learning and smaller chunks, but also support the ever-increasing informal knowledge processes. The respondents were asked to indicate whether there were systems to capture informal knowledge

from the members of the universities: 40 (33.90%) agreed, another 40 (33.90%) were neutral, 20 (16.95%) disagreed, 14 (11.86%) strongly agreed and 4 (3.39%) strongly disagreed. These results indicate that the respondents feel that informal knowledge was fairly captured (45.76%). The responses showed that even though the respondents agreed the universities generally did not do well in capturing informal knowledge, at the individual university level, GTUC was able to capture 50% (16.67% strongly agreed and 33.33% agreed). In comparison, UG and UPSA were able to capture a below average informal knowledge of 45.21% (10.96% strongly agreed and 34.25% agreed) and 44.44% (11.11% strongly agreed and 33.33% agreed) respectively.

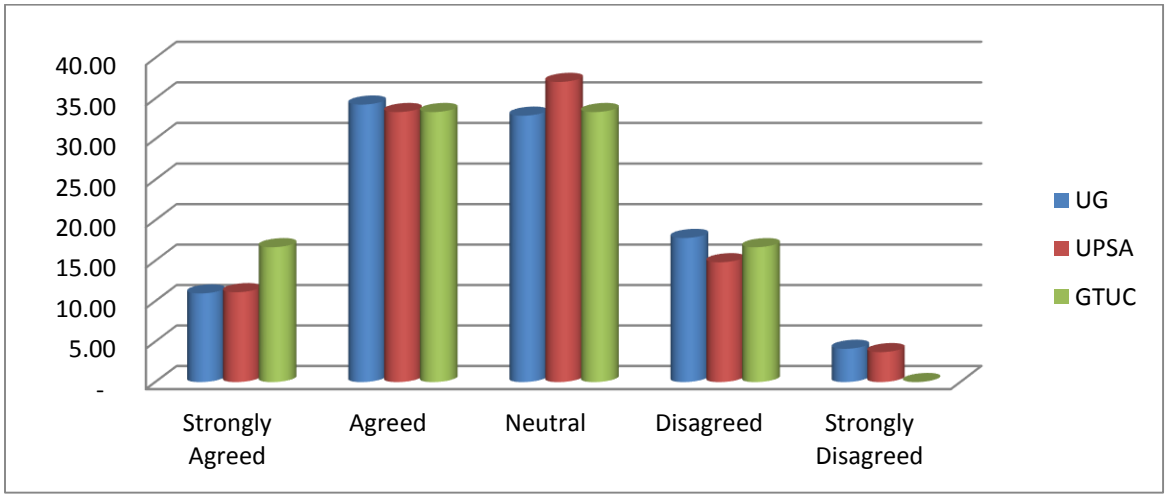


**Figure 5.4: Capturing informal knowledge**

Source: Field data (2015).

Additionally, 21.92% (17.81% disagreed and 4.11% strongly disagreed) of UG respondents, 18.52% (14.81% disagreed and 3.70% strongly disagreed) of UPSA respondents and 16.67% of GTUC respondents expressed a contrary opinion while 37.04%, 33.33% and 32.88% of UPSA, GTUC and UG respondents were neutral respectively. These results showed that the universities were not able to capture 54.24% of their informal knowledge. However, GTUC (50%) was able to capture more informal knowledge than UG (45.21%) and UPSA (44.44%).

#### 5.2.4.4 Institutional Repositories

An institutional repository with local content and knowledge is very important for KM, thus the researcher aimed to discover if the universities have implemented institutional repositories that

facilitate the capturing and storage of knowledge. The responses are as follows: 61 (51.69%) agreed, 31 (26.27%) were neutral, 16 (13.56%) disagreed, 8 (6.78%) strongly agreed and 2 (1.69%) strongly disagreed. These results showed that all the universities have implemented institutional repositories that capture and store knowledge.

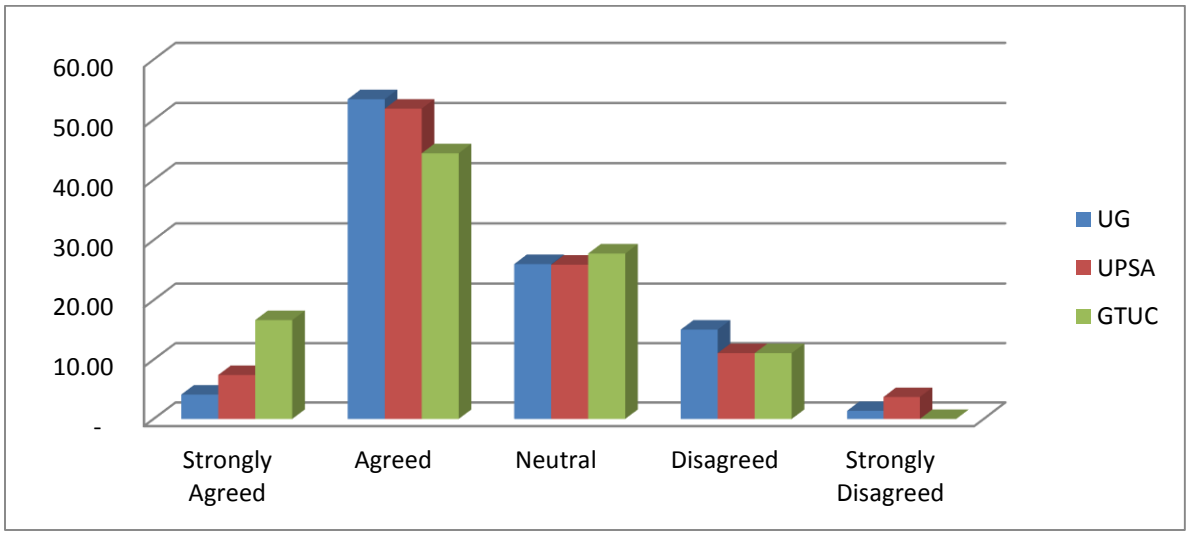


**Figure 5.5: Institutional repository**

Source: Field data (2015).

In comparative terms, more respondents from GTUC (61.11%: 16.67% strongly agreed and 44.44% agreed) than UPSA (59.26%: 7.41% strongly agreed and 51.85% agreed) and UG (57.53%: 4.11% strongly agreed and 53.42% agreed) confirmed the existence of an institutional repository to capture and store knowledge. Negative responses are 16.44% (15.07% disagreed and 1.37% strongly disagreed) from UG, 14.81% (11.11% disagreed and 3.70% strongly disagreed) from UPSA and 11.11% (11.11% disagreed) from GTUC. 27.78% (GTUC), 26.03% (UG) and 25.93% (UPSA) respondents were neutral.

Repositories are important for universities, as they assist in helping them capture, store and manage intellectual assets. They provide services to faculties, researchers and administrators who want to archive research findings, reports, book publications, creative materials, among others. The existence of repositories does not automatically ensure depositing of knowledge into them, therefore, the respondents were asked if knowledge created at the universities was captured and

stored in a repository. The responses revealed that 52 (44.07%) agreed, 29 (24.58%) were neutral, 25 (21.19%) disagreed, 7 (5.93%) strongly agreed and 5 (4.24%) strongly disagreed.

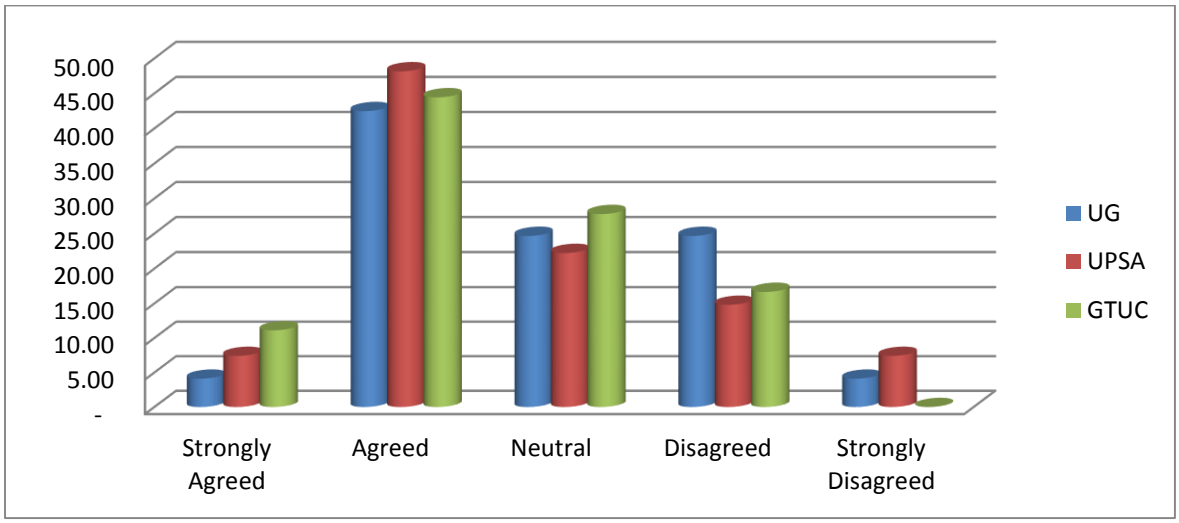


**Figure 5.6: Depositing in institutional repository**

Source: Field data (2015).

In comparative terms, 55.56% of the respondents from GTUC (11.11% strongly agreed and 44.44% agreed) believed knowledge created by staff was captured into the repository same as UPSA 55.56% (7.41% strongly agreed and 48.15% agreed), which was more than UG at 46.58% (4.11% strongly agreed and 42.47% agreed). However, 28.77% (24.66% disagreed and 4.11% strongly disagreed) of UG respondents, 22.22% (14.81% disagreed and 7.41% strongly disagreed) of UPSA respondents and 16.67% (16.67% disagreed and 0% strongly disagreed) of GTUC respondents expressed that knowledge created at the university was not captured and stored in a repository, while 27.78% (GTUC), 24.66% (UG) and 22.22% (UPSA) respondents remained neutral.

Notably, from these results, the majority of the respondents from UPSA and GTUC contributed their work into the institutional repository, since they were involved in knowledge creation through researching and publishing their work.

### 5.2.4.5 Accessing Knowledge

The researcher was interested in establishing the accessibility of knowledge from the repositories of the universities, thus it was requested that the respondents indicate whether there is easy access to knowledge from the repositories. The responses showed that 52 (44.07%) agreed, 37 (31.36%) were neutral, 18 (15.25%) disagreed, 7 (5.93%) strongly agreed while 4 (3.39%) strongly disagreed.

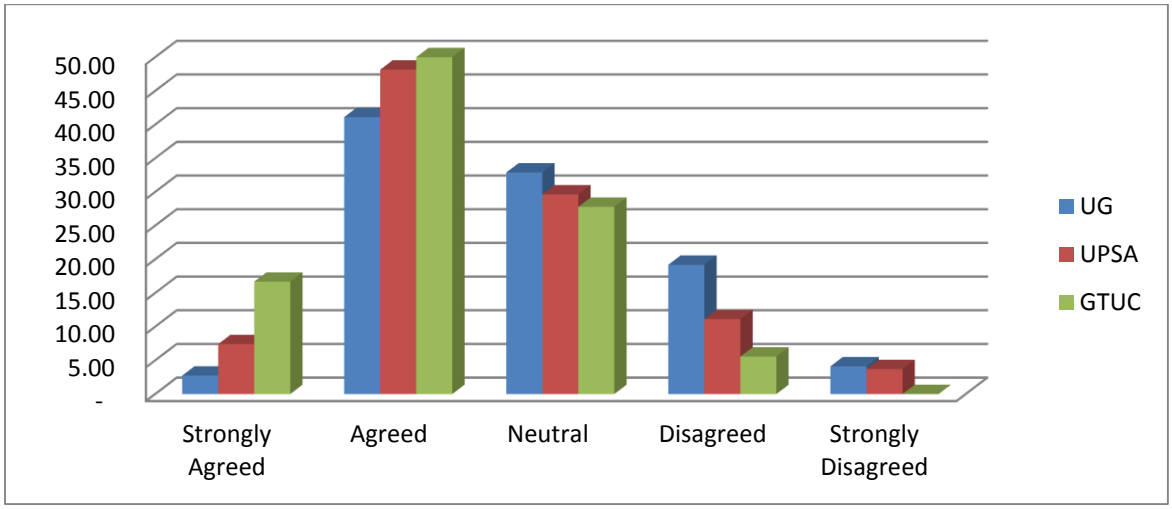


**Figure 5.7: Accessing knowledge from repositories**

Source: Field data (2015).

Comparatively, at GTUC (66.67%: 16.67% strongly agreed and 50% agreed) most of the knowledge was more accessible than at UPSA (55.56%: 7.41% strongly agreed and 48.15% agreed) and UG (43.84%: 2.74% strongly agreed and 41.10% agreed). However, 23.29% (19.18% disagreed and 4.11% strongly disagreed) of UG respondents, 14.81% (11.11% disagreed and 3.70% strongly disagreed) respondents from UPSA and 5.56% (5.56% disagreed and 0% strongly disagreed) of GTUC respondents expressed a contrary position. Lastly, 32.88% (UG), 29.63% (UPSA) and 27.78% (GTUC) respondents were neutral.

### 5.2.4.6 Knowledge Sharing

Organisations have recognised that knowledge constitutes a valuable, intangible asset for creating and sustaining competitive advantages (Anduvare, 2015). To gain an idea of the extent of knowledge sharing, questions were directed at discovering whether knowledge was easily shared

among staff across departments, to ensure that other members could learn from them, as well as at helping to avoid the replication of tasks. Forty-five of the respondents (38.14%) agreed, 35 (29.66%) were neutral, 24 (20.34%) disagreed, 8 (6.78%) strongly agreed and 6 (5.08%) strongly disagreed. These results revealed that most of the knowledge at the universities was not easily accessible or the staff were unaware that it was shared. Comparatively, GTUC (61.11%: 16.67% strongly agreed and 44.44% agreed) was able to share more knowledge across departments than UPSA (44.44%: 11.11% strongly agreed and 33.33% agreed) and UG (41.10%: 2.74% strongly agreed and 38.36% agreed).

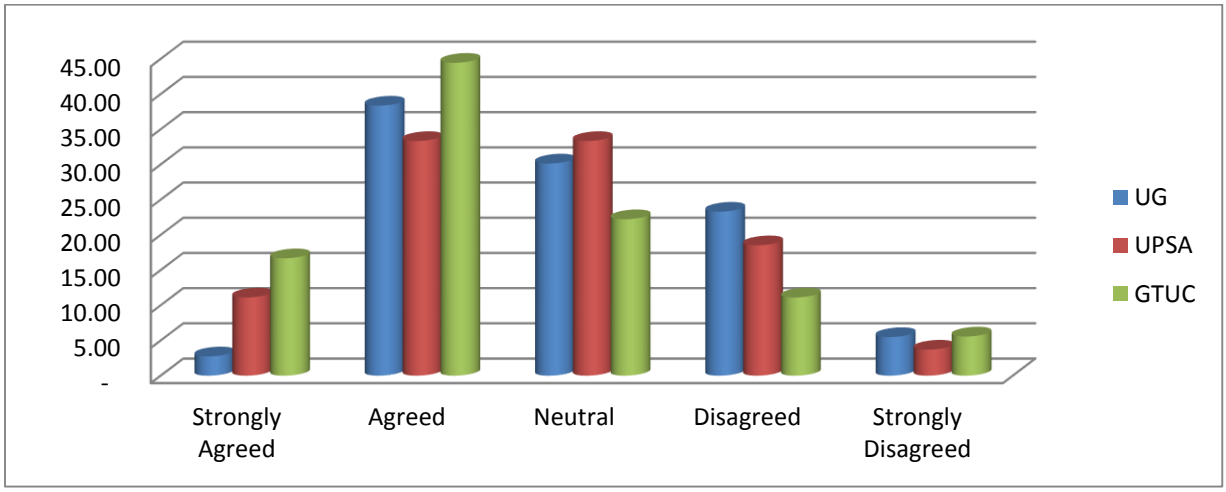


**Figure 5.8: Sharing knowledge across departments**

Source: Field data (2015).

On the other hand, 28.77% (23.29% disagreed and 5.48% strongly disagreed) of UG respondents expressed that sharing of knowledge across departments was not easy as compared to 22.22% (18.52% disagreed and 3.70% strongly disagreed) respondents from UPSA and 16.67% (11.11% disagreed and 5.56% strongly disagreed) from GTUC. Nonaka (2009) expresses the view that, while the difficulty of sharing knowledge lies in transferring knowledge from one entity to another, it may prove profitable for organisations to acknowledge these difficulties, its practicality and to adopt new KM strategies accordingly. The result clearly shows that knowledge constitutes a valuable, intangible asset for creating and sustaining competitive advantages within the universities.

#### 5.2.4.7 General Comments on Knowledge Management Processes

It is possible that the management of knowledge is promoted or inhibited by a myriad of barriers in an organisation, therefore, to motivate and effectively promote KM in organisations, knowledge content and a knowledge source must be perceived as a valued knowledge source (Desouza & Awazu, 2006). Respondents were asked to provide further comments on KM processes (creation, capturing, storage, sharing and usage of knowledge) at the universities. The comments from the respondents show that there were wide and varied understandings of KM processes. Below is a summary of the general comments outlined by the respondents.

##### 5.2.4.7.1 Knowledge Creation

- Employees should be involved in the decision-making and contribution of ideas towards the running of the universities.
- While knowledge is created, there is no formal, well thought-out mechanism for its storage, dissemination and evaluation.
- Knowledge creation, storage and sharing are encouraged, but not much support is given.
- Funds for research and publication should be increased to promote knowledge creation and capturing.

##### 5.2.4.7.2 Accessing and Sharing Knowledge

- Most shared knowledge is mainly for students.
- Knowledge is mostly from top to bottom and this hinders effective knowledge sharing.
- Awareness for sharing knowledge needs improvement.
- Sharing of knowledge is difficult for some staff, because they fear that if they share knowledge, their position may be threatened.

##### 5.2.4.7.3 Knowledge Repositories

- Repositories are available to gather all institutional information.
- The repositories are not easily accessible.

##### 5.2.4.7.4 Capturing Expert Knowledge

- Knowledge is sought from experts during crisis, but not ahead of crisis.

- The experts are fairly accessible and known, but only to those who have an interest in the particular expertise.
- Knowledge is not retained when an employee exits, unless the individual makes the effort to share it before leaving.
- Knowledge is rarely documented and rarely passed on, hence, a new staff member comes in with a completely different strategy.

#### 5.2.4.7.5 General Knowledge Management Processes

- Knowledge capturing, creation, storage and sharing are critical, as a lot of initiative is required in that area.
- KM policies must be formulated and implemented since there is currently no policy. These policies will guarantee and safeguard knowledge production and sharing at all levels.
- Networking among staff needs to be improved to help boost KM.
- Research grants should be made available on time.
- Academic workshops are rarely organised. This does not promote KM practice.

These comments showed that, according to the respondents, KM was, to a large extent, practiced at the universities and there were known KM experts who facilitated these practices. Finally, there were mechanisms and initiatives to promote KM.

### 5.2.5 Knowledge Management Leadership

Committed and effective leadership enhances organisational performance, as such, organisational leadership is a critical factor for building and reinforcing effective KM practice in organisations (Anduvare, 2015:100). Anduvare (2015) suggests that a successful KM strategy is attributable to exemplary leadership, which values trial and error and shows a commitment to innovation and continuous improvement. KM leadership was assessed through a few statements where staff indicated their level of agreement or disagreement.

#### 5.2.5.1 Recognition of and Valuing the Power of Intellectual Capacity

Knowledge is critical to the success of every organisation, hence, the importance of recognising its role and the fact that its importance should not be overlooked. The respondents were asked if

the universities recognise the power of the intellectual capacity of the staff–56 (47.46%) of the respondents agreed, 28 (23.73%) were neutral, 21 (17.80%) strongly agreed, 13 (11.02%) disagreed and no respondent strongly disagreed. The results indicate that 65.26% of the respondents believed the universities recognised and valued the intellectual capacity of their members. The results further show that respondents of GTUC (66.67%: 27.78% strongly agreed and 38.89% agreed) recognised and valued the intellectual capacity of their members more than UG (65.75%: 15.07% strongly agreed and 50.68% agreed) and UPSA (62.96%: 18.52% strongly agreed and 44.44% agreed). Furthermore, 12.33% of UG respondents, 11.11% of UPSA respondents and 5.56% of GTUC respondents expressed contrary position, while 27.78% (GTUC), 25.93% (UPSA) and 21.92% (UG) respondents were neutral.

#### 5.2.5.2 Leadership Support and Motivation of Knowledge Creation and Sharing

Support from management and the motivation of members to create and share knowledge will go a long way in enhancing KM initiatives. Respondents were asked if they are motivated by the management of the universities to create and share knowledge: 48 (40.68%) agreed, 31 (26.27%) were neutral, 24 (20.34%) disagreed, 12 (10.17%) strongly agreed and 3 (2.54%) strongly disagreed.

Dividing the data by university, it is shown that 55.56% (16.67% strongly agreed and 38.89% agreed) of GTUC members were largely motivated to create and share knowledge, more so than UPSA (51.85%: 11.11% strongly agreed and 40.74% agreed) and UG (49.32%: 8.22% strongly agreed and 41.10% agreed). Disparately, 24.66% (21.92% disagreed and 2.74% strongly disagreed) of UG respondents, 22.22% (18.52% disagreed and 3.70% strongly disagreed) of UPSA respondents and 16.67 (16.67% disagreed and 0% strongly disagreed) of GTUC respondents expressed contrary opinion. Similarly, a substantial proportion, 25.93% (UPSA), 27.78% (GTUC) and 26.03% (UG) respondents were neutral. These results suggest that the management of the universities supported and motivated members to create and share knowledge.

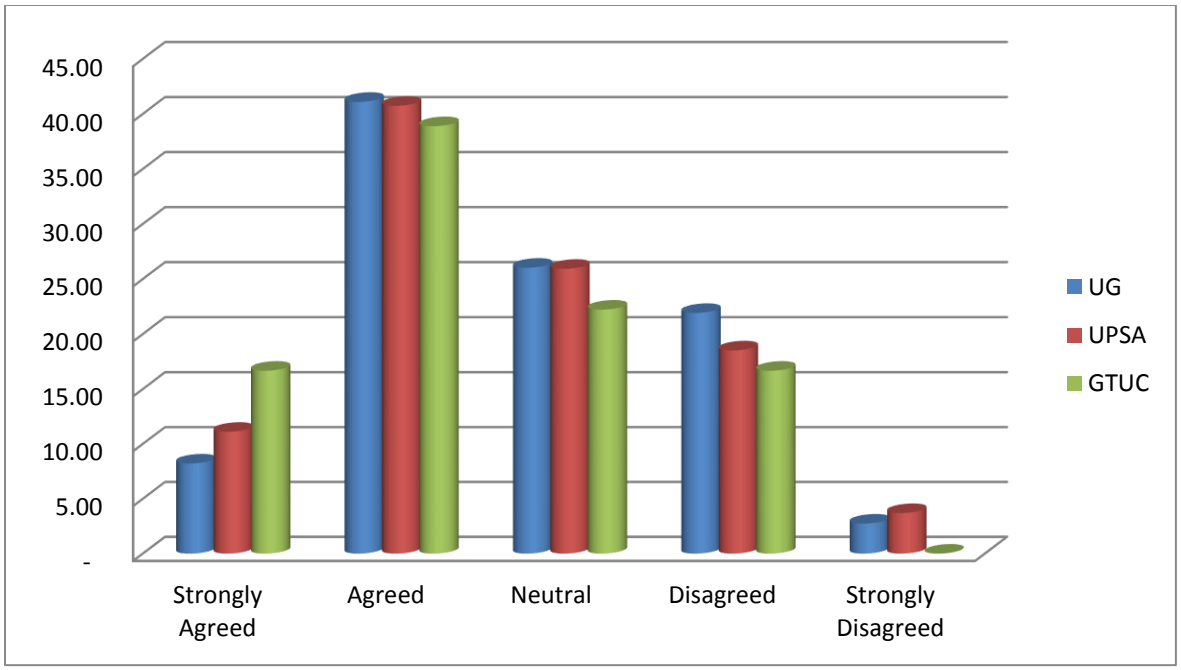


**Figure 5.9: Leadership support for knowledge creation**

Source: Field data (2015).

#### 5.2.5.3 Evaluating Employees for Knowledge Creation

Respondents were asked if the employees are typically evaluated for knowledge creation and sharing. The reasoning behind this question was to highlight the need to evaluate employees on knowledge creation and sharing. The results showed that 75 (63.56%: 15.25% strongly agreed and 48.31% agreed) believed they were evaluated for knowledge creation while 25 (21.19%) were neutral, 17 (14.41% disagreed) and 1 (0.85%) strongly disagreed. This indicates that quite a number of respondents were not aware or did not believe that staff were evaluated for knowledge creation and sharing. The results further show that more GTUC staff (66.67%: 27.78% strongly agreed and another 38.89% agreed) indicate that they were evaluated, followed by UG (63.01%: 10.96% strongly agreed and 52.05% agreed) and UPSA (62.96%: 18.52% strongly agreed and 44.44% agreed). Dissenting responses included 16.44% for UG, 14.81% for UPSA and 11.11% for GTUC. As seen with previous questions, a high percentage of respondents, 22.22% (GTUC), 22.22% (UPSA) and 20.55% (UG) were neutral.

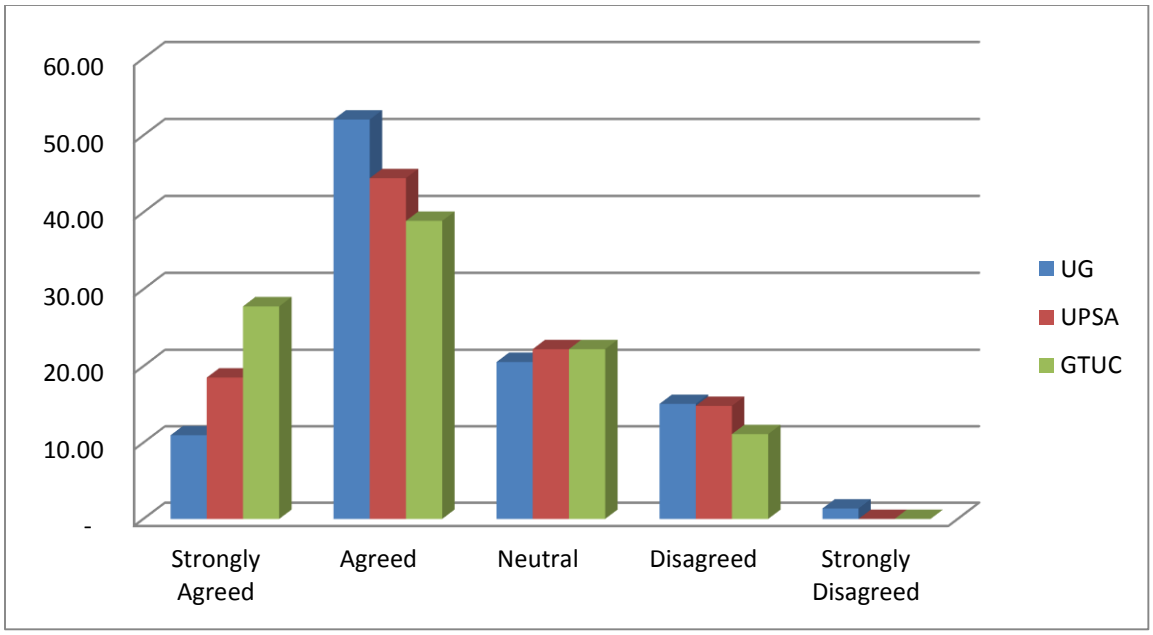


**Figure 5.10: Evaluating employees for knowledge creation and sharing**

Source: Field data (2015).

#### 5.2.5.4 Knowledge Management Vision

The success of KM in organisations, to some extent, depends on the leadership having a clearly articulated and established KM vision. According to the responses received,56 (47.46%) respondents were neutral, 36 (30.51%) agreed, 17 (14.41%) disagreed, 6 (5.08%) strongly disagreed and 3 (2.54%) strongly agreed that the leadership has not been able to clearly articulate and establish a KM vision and agenda at the universities. The majority of the respondents from UG (52.05%), as well as 40.74% from UPSA and 38.89% from GTUC and another 22.22% (14.81% disagreed and 7.41% strongly disagreed) respondents from UPSA were unaware of the policy. Similarly, 19.18% (15.07% disagreed and 4.11% strongly disagreed) respondents from UG and 16.67% (11.11% disagreed and 5.56% strongly disagreed) respondents from GTUC explicitly answered negatively. However, an appreciable proportion of 44.44% (5.56% strongly agreed and 38.89% agreed) of the respondents from GTUC, 37.04% (3.70% strongly agreed and 33.33% agreed) respondents from UPSA and 28.77% (1.37% strongly agreed and 27.40% agreed) respondents from UG believed there was a clearly articulated KM vision along with a knowledge agenda at the universities.

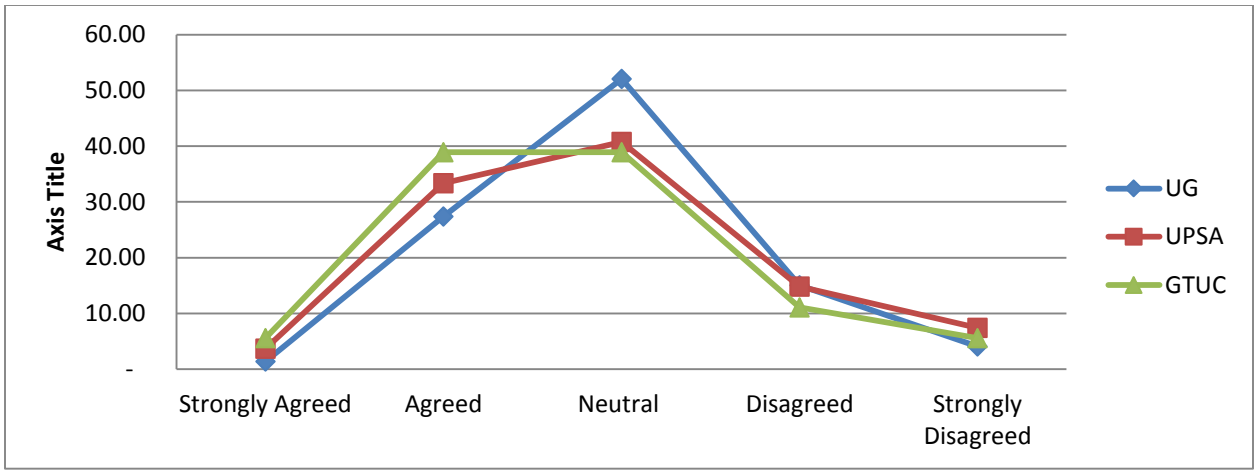


**Figure 5.11: Knowledge management vision**

Source: Field data (2015).

### 5.2.5.5 Knowledge Management Promoters (Champions)

Anduvare (2015) posit that leaders should have specific knowledge and skills to champion the concept of KM within an organisation, as well as spearhead the enormous challenges to overcome inherent obstacles to ensure the free flow of knowledge. The researcher aimed to discover if the universities have employees who are dedicated to push KM processes. The responses showed that 70 (59.32%) agreed, 38 (32.20%) were neutral, 10 (8.47%) strongly agreed and 10 (8.47%) disagreed. Although these findings indicate that there were several knowledge promoters at the universities, a fair proportion of the respondents were not aware of the enthusiastic knowledge champions. Furthermore, the results show that GTUC (66.67%: 16.67% strongly agreed and 50% agreed) had more respondents aware of the knowledge champions than UPSA (62.96%: 7.41% strongly agreed and 55.56% agreed) and UG (56.16%: 6.85% strongly agreed and 49.32% agreed). However, many respondents from UG (34.25%) took a neutral position while 29.63% respondents from UPSA and 27.78% respondents from GTUC did the same. The results also indicated that 9.59% respondents from UG, 7.41% from UPSA and 5.56% from GTUC were unaware of the knowledge champions.

### 5.2.5.6 Leadership Interaction with Staff

There is need for interaction and teamwork, not only among employees from different disciplines, but also within management in order to enhance KM effectiveness. When asked if the management

teams of the universities have effective interaction with employees, the responses were encouraging, as 59 (50%: 9.32% strongly agreed and 40.68% agreed) responded in the affirmative, while 43 (36.44%) were neutral and 16 (13.56%: 11.02% disagreed and 2.54% strongly disagreed) dissented. Comparatively, GTUC and UPSA had an above average rate of 55.56% (16.67% strongly agreed and 38.89% agreed) and 51.85% (14.81% strongly agreed and 37.04% agreed), respectively, while UG had a below average rate of 47.95% (5.48% strongly agreed and 42.47% agreed). However, 15.07% (12.33% disagreed and 2.74% strongly disagreed), 14.81% (11.11% disagreed and 3.70% strongly disagreed) and 5.56% (5.56% disagreed and 0% strongly disagreed) of UG, UPSA and GTUC, respectively, expressed a contrary opinion. In addition, 38.89% (GTUC), 36.77% (UG) and 33.33% (UPSA) respondents were neutral. These results indicated that UG trailed UPSA and GTUC in terms of their management promoting effective teamwork among faculty members.

#### 5.2.5.7 Leadership Openness and Transparency with Staff

Lastly, regarding leadership, respondents were asked if the management of the universities had a culture of openness and transparency with the staff, which would stimulate innovation, learning and knowledge sharing. 48 (40.7%) agreed, 36 (30.5%) were neutral, 24 (20.34%) disagreed, while 6 (5.08%) strongly agreed and 4 (3.39%) strongly disagreed. There was an indication from the results that the majority of the respondents (54.23) think that a culture of openness and transparency between the management and staff was being encouraged. Comparatively, the positive responses include 55.56% (11.11% strongly agreed and 44.44% agreed) from GTUC, 45.21% (2.74% strongly agreed and 42.47% agreed) from UG and 40.74% (7.40% strongly agreed and 33.33% agreed) from UPSA.

#### 5.2.5.8 Comments on Knowledge Management Leadership by Respondents

Respondents were asked to provide any further comments on KM leadership at the universities. Presented below is a summary of their comments.

- Dedicated knowledge promoters are very limited.
- Some individuals who will be solely responsible for promoting and harnessing knowledge are needed.
- Feedback for enquiries from management is very limited.

- There are staff meetings, but the majority of items discussed are already decided upon.
- There are some levels of interaction and collaboration with management.
- Staff typically request and approach management for discussions.
- Some of the management members are reluctant and unwilling to release information freely.
- Obtaining information from management could be challenging.
- There is limited support and funding by management to motivate staff to create and share knowledge.
- The financial support for training, workshops, conferences and seminars for staff for knowledge creation and sharing is not adequate.
- Management must make an effort to raise funds and scholarships towards doctorate degrees for staff.
- The books and research allowance available are not sufficient to support real research and publish works.
- Management pays some attention to knowledge gained, experience and contribution to knowledge and the transfer thereof.
- There is an absence of policies to guide KM practice at the universities.

The above views from the staff (respondents) display contradicting views with some of the results, which indicated that leadership supported KM activities at the universities. The comments stipulated that there was no aggressive and focused support by leadership for KM to function. It is also indicated that not all members of management freely interact with employees to enhance the possibility of learning from them and, in some cases, it was reliant on staff members to approach management.

### 5.2.6 Knowledge Management Culture

Organisational culture is a fundamental factor in KM implementation, as with KM leadership, it is a critical aspect in the successful implementation of a KM initiative. The researcher sought to discover if a culture of trust, openness and willingness to create and share knowledge exist at the universities.

### 5.2.6.1 Knowledge Management Culture of Trust

A culture of trust forms the basis for knowledge sharing and learning among employees, thus, it should be encouraged. The respondents were asked to state if they trust each other to share knowledge. The responses showed that 38 (32.20%) agreed, 38 (40.68%) were neutral, 18 (15.25%) disagreed, 11 (9.32%) strongly agreed and 3 (2.54%) strongly disagreed. The results indicate that, at 41.52%, trust was at an inferior level as a basis of knowledge sharing and learning among employees.

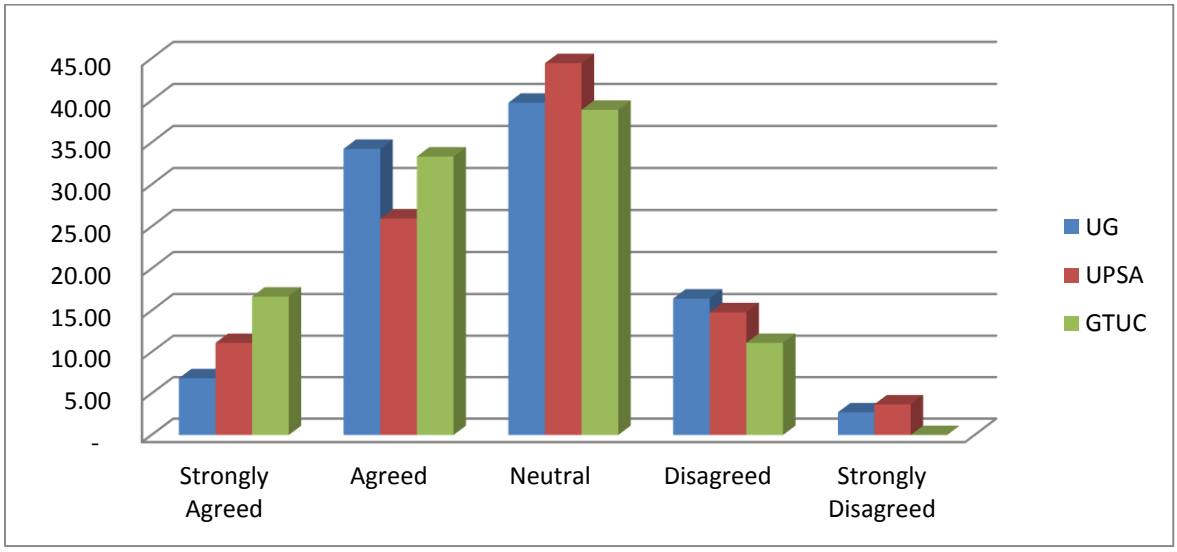


**Figure 5.12: Trust among staff**

Source: Field data (2015).

Comparatively, 50% (16.67% strongly agreed and 33.33% agreed) respondents from GTUC, 41.10% (6.85% strongly agreed and 34.25% agreed) respondents of UG and 37.04% (11.11% strongly agreed and 25.93% agreed) respondents of UPSA trust themselves when it comes to knowledge sharing. On the other hand, 19.18% (16.44% disagreed and 2.74% strongly disagreed) respondents of UG, 18.52% (14.81% disagreed and 3.70% strongly disagreed) respondents of UPSA and 11.11% respondents of GTUC expressed a contrary opinion. A substantial proportion, consisting of 44.44% (UPSA), 39.73% (UG) and 38.89% (GTUC) respondents were neutral. This showed that the level of trust that exists among members to share knowledge at GTUC was more than at UG and UPSA.

### 5.2.6.2 Knowledge Management Willingness to Collaborate and Share Knowledge

Brcic and Mihelic (2015) indicate that willingness significantly influences knowledge sharing, communication and collaboration. The researcher requested the respondents to indicate their level of willingness to collaborate and share knowledge across departments/schools. Forty-nine (41.25%) were neutral, 38 (32.20%) agreed, 18 (15.25) disagreed, 10 (8.47%) strongly agreed and3 (2.54%) strongly disagreed.

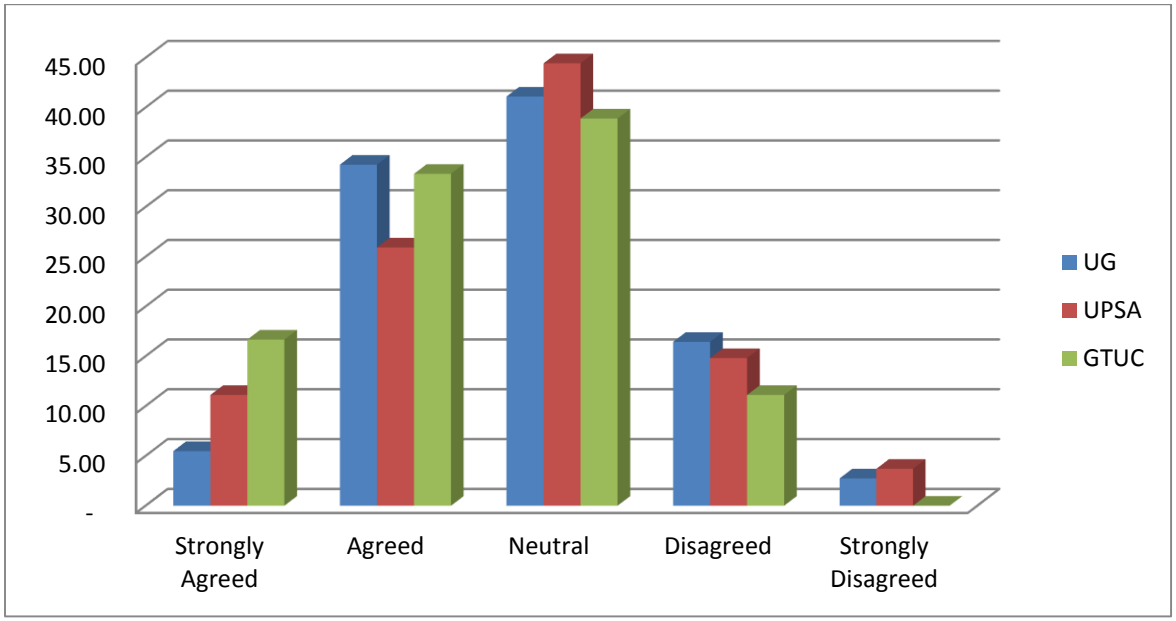


**Figure 5.13: Willingness to collaborate and share knowledge**

Source: Field data (2015).

The level of willingness to collaborate and share knowledge at the individual universities consisted of the following: 50% (16.67% strongly agreed and 33.33% agreed) from GTUC, 39.73% (5.48% strongly agreed and 34.25% agreed) from UG and 37.04% (11.11% strongly agreed and 25.93% agreed) from UPSA. Additionally, of the respondents who expressed their unwillingness, 19.18% (16.44% disagreed and 2.74% strongly disagreed) were from UG, 18.52% (14.81% disagreed and 3.70% strongly disagreed) were from UPSA and 11.11% were from GTUC. Finally, 44.44% (UPSA), 41.10% (UG) and 38.89% (GTUC) took neutral positions respectively. This shows that GTUC staff were more willing to collaborate and share information and knowledge among themselves than UPSA and UG.

#### 5.2.6.3 Comments on Knowledge Management Culture at the Universities

The respondents were given the opportunity to provide comments on KM culture. These comments are presented below.

- The willingness to share is rising because of the increase in the number of experts who are being absorbed by the universities.
- The universities must put in place mechanisms that ensure that all employees feel that they belong, to enhance the common good of the university.
- The culture of knowledge sharing should be enhanced.
- The culture of interaction is not widely spread, it is mostly within departments or colleagues in the same office.
- The culture of learning among students has drastically reduced
- The culture of trust is simply not there.
- There is no motivation for collaboration and knowledge sharing.

The comments above demonstrate that there exists a culture of openness, trust and willingness to collaborate at the universities, but it requires improvement for KM to succeed. There is also some willingness to collaborate, although it is contained within departments. Extending the practice to other departments is dependent upon other factors, such as what one would gain from the collaboration.

### 5.2.7 Knowledge Management Technology

Technology has long been an enabler for KM (Knoco, 2015), such as: collaborative computing tools, internet, intranet, knowledge servers, groupware, knowledge portals, document and content management systems, knowledge harvesting tools as well as search engines are critical enablers of KM (Gupta, 2004; Dewah, 2011; Davenport, 2013; Knoco, 2015). The researcher sought to determine if the appropriate technologies were available and accessible at the universities. Availability, speed, access and storage capabilities of the KM technologies formed the basis of accessing opinions of from the respondents.

### 5.2.7.1 Information Communications Technology Infrastructure

ICT provides tools for creating, sharing, managing, storing and retaining knowledge. Out of the questionnaires returned, the majority of the respondents (57.63%: 7.63%: strongly agreed and 50% agreed) affirmed that their universities have a proper ICT infrastructure that can support KM processes while 30.51% were neutral and 11.86% (8.47% disagreed and 3.39% strongly disagreed) gave contrary responses. The findings also showed that, out of the positive responses, 72.22% (16.67% strongly agreed and 55.56% agreed) were from GTUC, 59.26% (7.41% strongly agreed and 51.85% agreed) were from UPSA and 53.42% (5.48% strongly agreed and 47.95% agreed) were from UG.

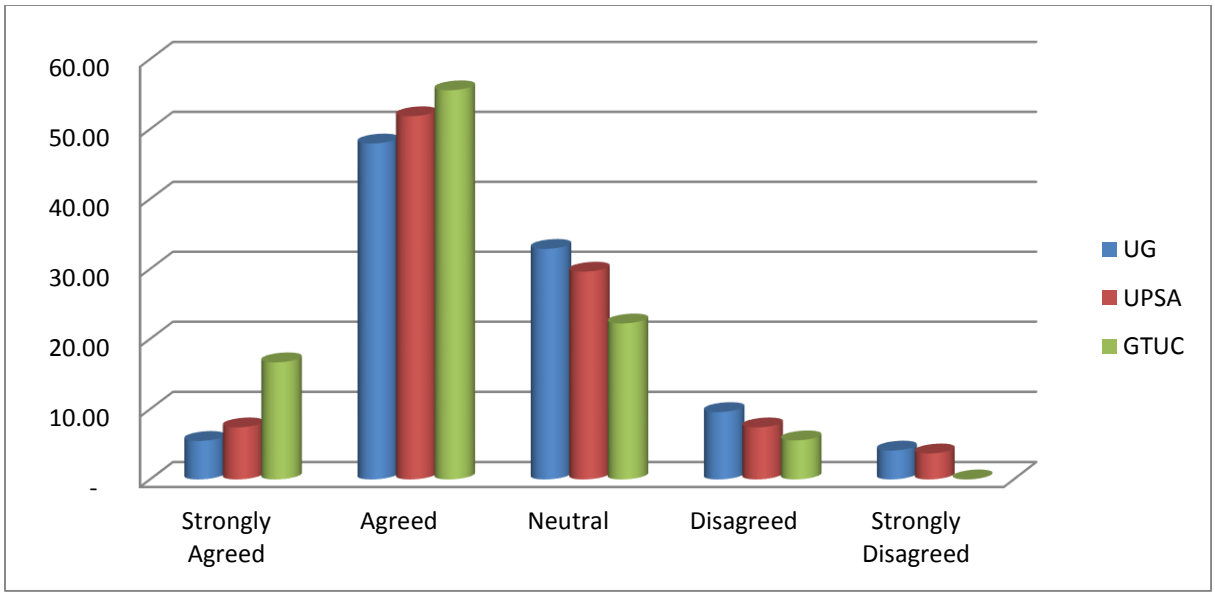


**Figure 5.14: Availability of ICT infrastructure**

Source: Field data (2015).

However, 13.70% (9.59% disagreed and 4.11% strongly disagreed) of the respondents from UG, 11.11% (7.41% disagreed and 3.70% strongly disagreed) of the respondents from UPSA and 5.56% (5.56% disagreed and 0% strongly disagreed) of the respondents from GTUC expressed a contrary opinion. Similarly, a substantial proportion, 32.88% (UG), 29.63% (UPSA) and 22.22% (GTUC) respondents were neutral. These results show that, although the respondents indicated that there were plenty of ICT infrastructures at the universities, GTUC had a higher score than UPSA and UG.

### 5.2.7.2 Information Communications Technology Infrastructure Supporting Access

The respondents were asked if the ICT infrastructure at their universities supports easy access to knowledge. This question intended to establish if the staff were able to create and share knowledge at any moment on campus using ICT. The majority of the respondents (53.39%: 6.78 strongly agreed and 46.61% agreed) affirmed that the ICT infrastructure supports easy access to knowledge at the universities, 38 (32.20%) were neutral and 18 disagreed (15.25%: 13.56% disagreed and 1.69% strongly disagreed).

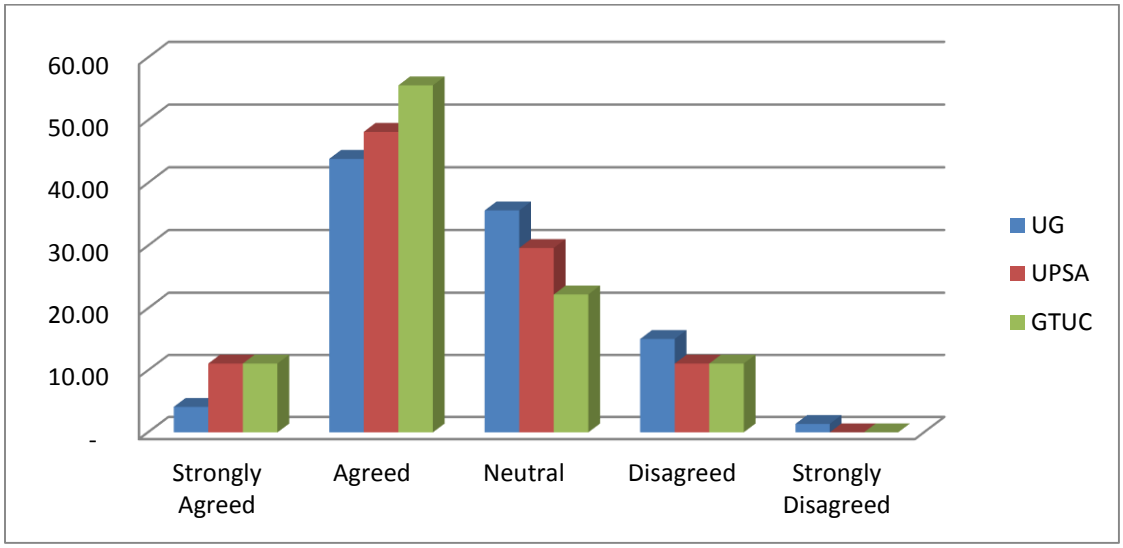


**Figure 5.15: ICT infrastructure supporting access to knowledge**

Source: Field data (2015).

In comparison, of the positive responses, 66.67% (11.11% strongly agreed and 55.56% agreed) were from GTUC, 59.26% (11.11% strongly agreed and 48.15% agreed) were from UPSA and as little as 47.95% (4.11% strongly agreed and 43.84% agreed) were from UG. However, some of the respondents disagreed. These included 16.44% (15.07% disagreed and 1.37% strongly disagreed) from UG, 14.81% (11.11% disagreed and 3.70% strongly disagreed) from UPSA and 11.11% (11.11% disagreed and 0% strongly disagreed) from GTUC. The neutral responses included: 35.62% from UG, 29.63% from UPSA and 22.22% from GTUC. The above results show that, while the majority of the respondents are able to access knowledge using ICT, the technology

and infrastructure at GTUC (66.67%) enabled the respondents to be able to access knowledge more easily than UPSA (59.26%) and UG (47.95%).

In addition, the respondents were asked if the universities had appropriate technologies, such as intranets and portals, through which they could upload and share knowledge. An average of 59 (50%) responded in an affirmative way, of which 6 (5.08%) strongly agreed and 53 (44.92%) agreed. Furthermore, 42 (35.59%) were neutral while 15 (12.71%) disagreed and 2 (1.69%) strongly disagreed.

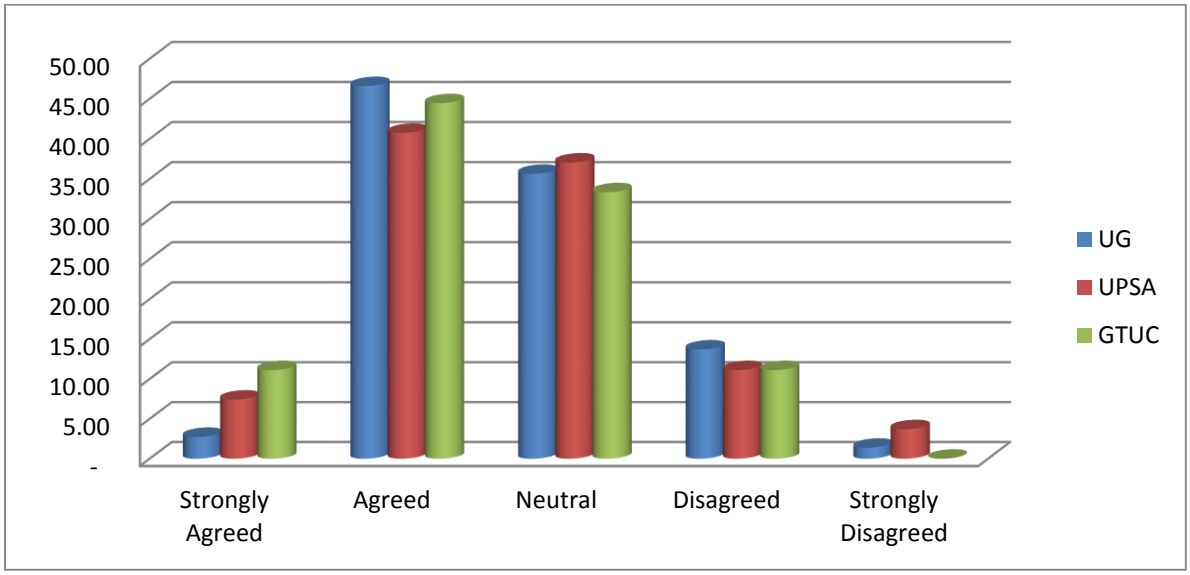


**Figure 5.16: Availability of intranet and portals to facilitate KM**

Source: Field data (2015)

Though the majority of responses showed that appropriate technologies, such as intranets and portals were available, only 55.56% (11.11% strongly agreed and 44.44% agreed) of the respondents from GTUC responded affirmatively while UG and UPSA recorded a below average of 49.32% (2.74% strongly agreed and 46.58% agreed) and 48.15% (7.41% strongly agreed and 40.74% agreed), respectively. On the other hand, UG had the highest negative response rate of 15.07% (13.70% disagreed and 1.37% strongly disagreed) followed by UPSA (14.81%: 11.11% disagreed and 3.70% strongly disagreed) and GTUC (11.11%: 11.11% disagreed and 0% strongly disagreed). Lastly, 37.04%, 35.62% and 33.33% respondents from UPSA, UG and GTUC, respectively, were neutral.

#### 5.2.7.4 Technology Facilitating Collaboration

On whether the technologies helped members to be able to collaborate with other persons outside the university, out of the respondents, 49 (41.53%) agreed, 42 (35.59%) were neutral, 17 (14.41%) disagreed, 6 (5.08%) strongly agreed and 4 (3.39%) strongly disagreed. These results showed that only a marginal portion believed the available technology provided prospects for collaboration with others within and outside the universities, bringing them closer as a team and enabling communication. Despite this, GTUC had an above average positive response rate of 55.56% (11.11% strongly agreed and 44.44% agreed) while UG and UPSA had below average response rates of 45.21% (2.74% strongly agreed and 42.47% agreed) and 44.44% (7.41% strongly agreed and 37.04% agreed) respectively. Conversely, UG had the highest negative response rate of 20.55% (16.44% disagreed and 4.11% strongly disagreed) followed by UPSA (14.81%: 11.11% disagreed and 3.70% strongly disagreed) and GTUC (11.11%: 11.11% disagreed and 0% strongly disagreed). Out of the respondents, 40.74%from UPSA, 34.25% from UG and 33.33% from GTUC were neutral in their responses.

#### 5.2.7.5 Technology Supporting Teaching, Research and Learning

When asked if the available technology makes teaching, research and learning at the university simpler, 50.85% (5.93% strongly agreed and 44.92 agreed) responded favourably while 28.81% were neutral and 20.34% (17.80 disagreed and 2.54% strongly disagreed) gave an adverse response. These results support the assertion of Granberg (2000) that technologies should aid teaching, research and learning.

Though the responses were encouraging, GTUC proved to be outstanding with 61.11% (11.11% strongly agreed and 50% agreed) followed by UPSA with 51.85% (7.41% strongly agreed and 44.44% agreed) and UG with a below average of 47.95% (4.11% strongly agreed and 43.84% agreed). In contrast, UG had the highest negative response rate of 24.66% (21.92% disagreed and 2.74% strongly disagreed) followed by UPSA (18.52%: 14.81% disagreed and 3.70% strongly disagreed) and GTUC (5.56% disagreed and 0% strongly disagreed). In addition, 33.33% of the respondents from GTUC, 29.63% of the respondents from UPSA and 27.40% of the respondents from UG were neutral.

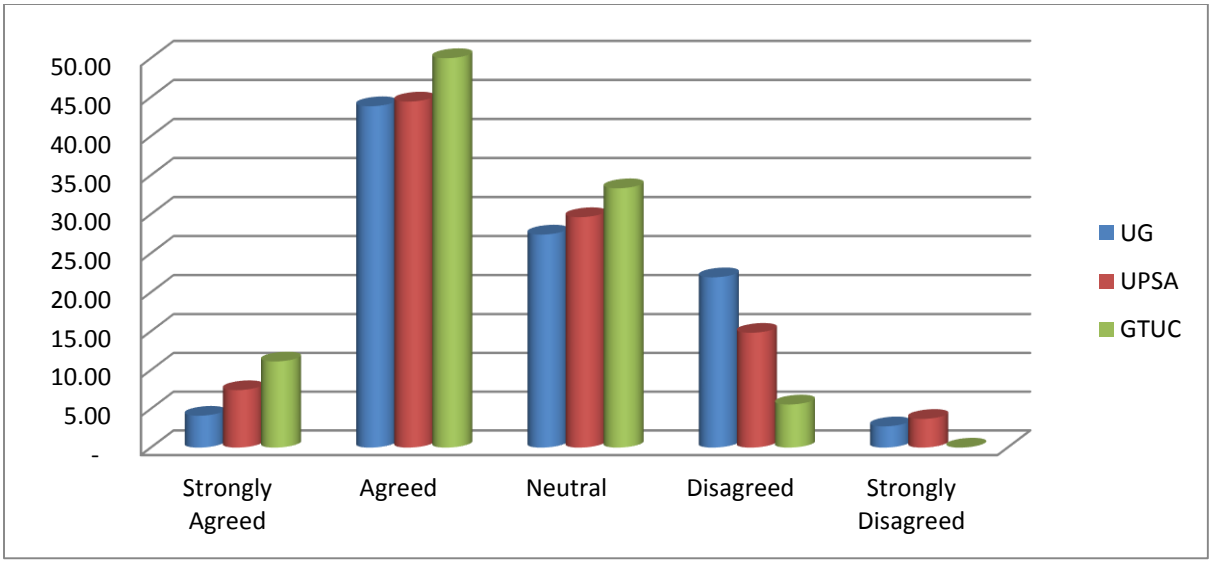


**Figure 5.17: Technology supporting teaching, research and learning**

Source: Field data (2015)

### 5.2.8 Systems/Facilities that Facilitate Knowledge Management

Another major objective of the study was to identify the systems or facilities that facilitate KM at the universities. The rapidly growing use of ICT in academia is changing the way in which knowledge is created, organised, stored, managed and disseminated. It has influenced teaching, research, learning and innovation in universities and has fostered a constructive, open, dynamic, interconnected, distributed, adaptive, user-friendly, socially concerned and accessible wealth of knowledge. With choices of internet, e-mail, intranet, Groupware, telecommunication, memorandum, weblogs, mobile technology, online/web-based learning system and CD/DVD/VCD, respondents were asked to indicate whether these tools were used to facilitate knowledge creation and sharing at the universities or not.

#### 5.2.8.1 E-mails

The use of e-mail has become a powerful way to create, organise, share and rapidly access information and knowledge in organisations. The responses received confirmed this, as 63.56% agreed that e-mail was used to facilitate KM at the universities while 27 (22.88%) were not aware and 16 (13.56%) said it is not used. The majority agree that e-mail has provided a prospect to enable communication, thus, efforts should be put in place to increase its use for knowledge

creation and sharing. Comparatively, the use of e-mail was more effective at GTUC (88.89%) that UPSA (81.48%) and UG (50.68%).

#### 5.2.8.2 Internet

Respondents were asked to indicate if the internet was used as a tool to facilitate KM at the universities, the results showed that a significant majority of 96 (81.36%) respondents agreed, while 14 (11.86%) were neutral and 8 (6.78%) disagreed. Despite the overarching, positive response rate, the use of internet at GTUC (88.89%) was relatively higher than UPSA (81.48%) and UG (79.45%).

#### 5.2.8.3 Intranet

In trying to find the amount of knowledge shared or consumed using intranet as a system for KM, the researcher asked the respondents to indicate if an intranet system was being used. 66 (55.93%) agreed, 26 (22.03%) disagreed and another 26 (22.03%) were not aware. The results imply that while the majority of the employees agree that the intranet supported KM at the universities, a significant number disagree while another significant proportion are neutral.

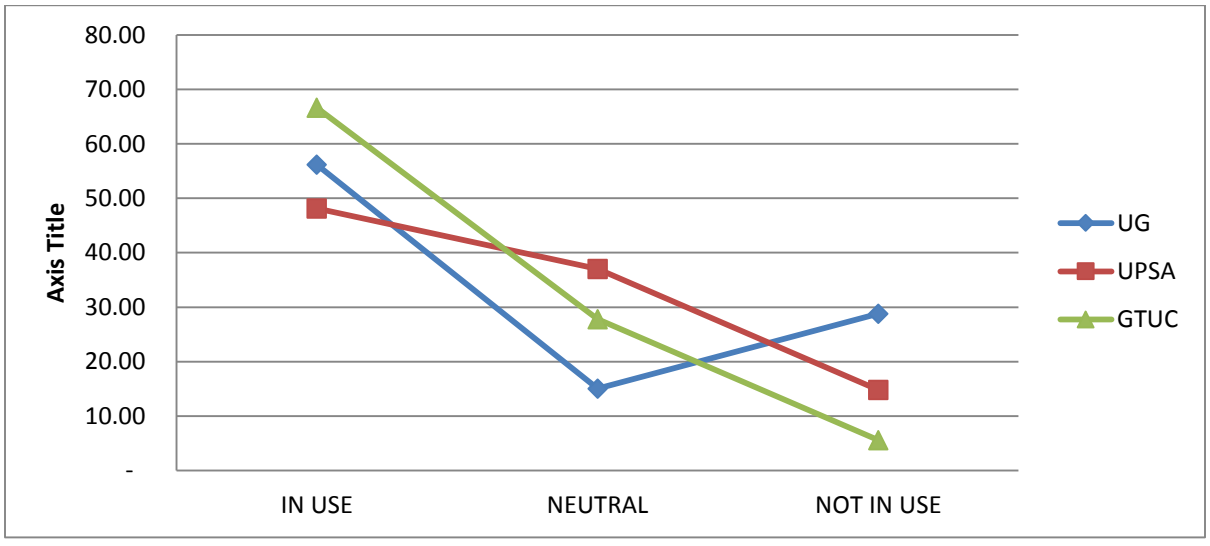


**Figure 5.18: Knowledge management facilitated by intranet**

Source: Field data (2015).

The results also show that intranet was more commonly used as a system to facilitate KM at GTUC (66.67%) than at UG (56.16%) and UPSA (48.15).

#### 5.2.8.4 Groupware

The researcher wanted to establish the viability of groupware in support of knowledge sharing and ultimately KM at the universities. Fifty-one (43.22%) of the respondents were not aware whether groupware was used to support KM, 40 (33.90%) said it was used and 27 (22.88%) said it was not used. These results showed that the majority of respondents were either unaware or knew that groupware was not used to facilitate KM. The results further showed that the use of groupware by the individual universities was discouraging with a 44.44%, 40.74% and 28.77% rate of usage for GTUC, UPSA and UG, respectively.

#### 5.2.8.5 Weblogs

As with groupware, the researcher wanted to establish the viability of weblogs in support of knowledge sharing and KM. According to the responses, while 83 (70.34%) were neutral on the issue whether the universities use Weblogs, 27 (22.88%) responded no and 8 (6.78%) responded yes. These results showed that the majority of respondents chose to be neutral, which could mean that they are not aware of the existence of  or they knew of its existence, but do not know if it is used for KM. The results further show that the use of weblogs by the individual universities was very discouraging with 11.11%, 7.41% and 5.48% rate of usage for GTUC, UPSA and UG, respectively.

#### 5.2.8.6 Boardroom

As boardrooms serve as a platform for brainstorming and knowledge sharing, the respondents were asked whether they used boardroom for knowledge sharing or not. 68 (57.63%) responded yes, 30 (25.42%) responded no and 20 (16.95%) respondents were unaware. From the results, there were indications that not all employees were aware of whether boardroom was used for knowledge creation and sharing. Despite a highly positive response rate, UG's response was below average (43.84) while GTUC and UPSA had a high response of 83.33% and 77.78% respectively.

### 5.2.8.7 Teleconferencing

Teleconferencing serves as a tool that supports organisations that are looking for an efficient and cost-effective way of knowledge creation and delivery. Through the survey, the researcher asked the respondents to indicate whether teleconferencing was used to facilitate knowledge creation and sharing or not. Forty-eight participants (40.68%) were not aware (neutral), 36 (30.51%) responded affirmatively and 34 (28.81%) said that it is not used. Despite the below average positive response rate associated with UPSA (44.44%) and UG (16.44%), GTUC had an above average positive response rate of 66.67%. These results indicated that the use of teleconferencing to facilitate KM at GTUC was much higher than at UPSA and UG.

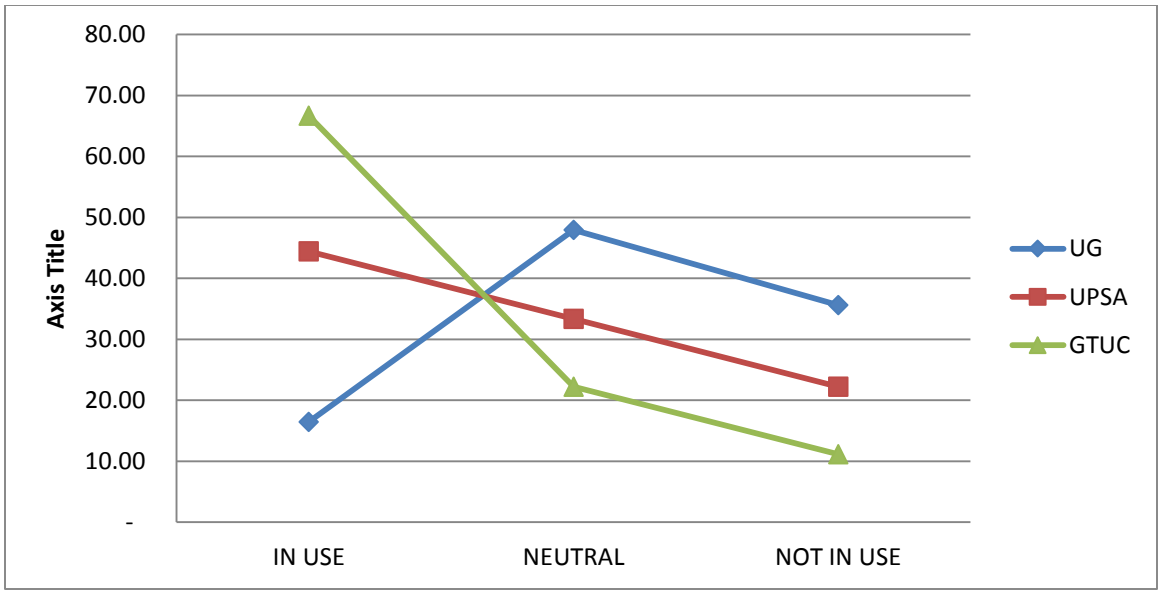


**Figure 5.19: knowledge management facilitated by teleconferencing**

Source: Field data (2015)

### 5.2.8.8 Memoranda

The researcher wanted to establish if memoranda serve as tools that facilitate communication and KM at the universities. The majority (60.17%) of the respondents affirmed this, while 32.20% were not aware and 7.63%stated that they are not used. The results further showed that, while 77.78% (GTUC), 66.67% (UPSA) and 53.42% (UG) respondents agreed that memoranda were used to facilitate KM at the universities, 38.36% (UG), 25.93% (UPSA) and 16.67% (GTUC)

respondents were neutral and 8.22% (UG), 7.41% (UPSA) and 5.56% (GTUC) respondents said that it was not in use.

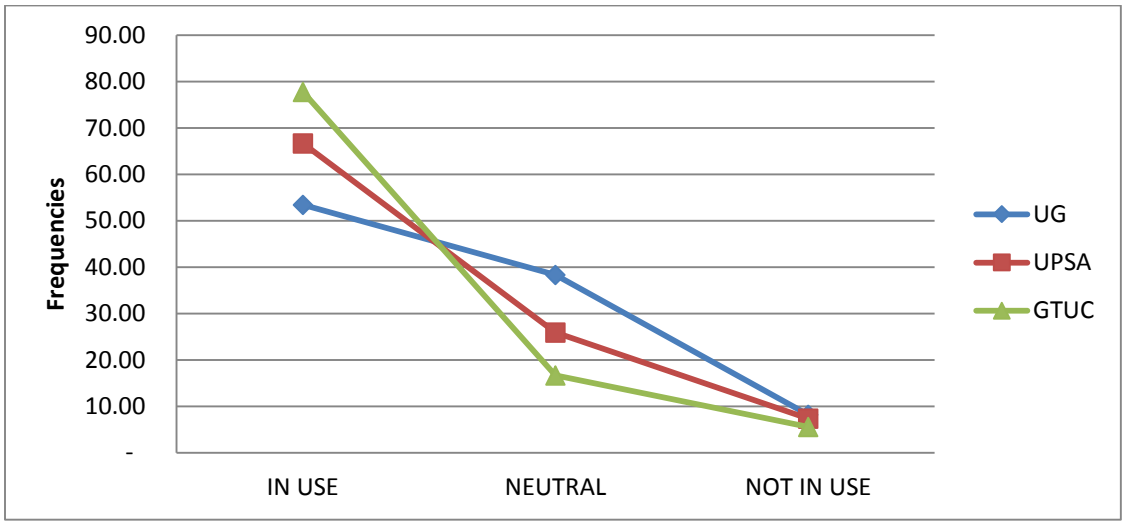


**Figure 5.20: KM facilitated by memoranda**

Source: Field data (2015)

### 5.2.8.9 Mobile Technology

Mobile technology for e-learning enables learning across multiple contexts through social and content interactions, using personal electronic devices. These devices include handheld computers, MP3 players, notebooks, mobile phones and tablets. The researcher asked the respondents to indicate whether these tools were used for KM at the universities, Sixty-six (55.93%) said they were used while 29 (24.58%) were uncertain and 23 (19.49%) said they were not used. From the results, there is an indication that not all staff were aware whether mobile technologies were used for KM. The results further show that GTUC (77.78%) recorded a higher mobile technology usage than UPSA (55.56%) and UG (50.68%).

### 5.2.8.10 Online/Web-based Learning System

A web-based learning system allows instructors to create individualised web pages. When the researcher asked the respondents to indicate the level of its usage at the universities, half of the respondents (50%) were not aware, 37.29% indicated they were not used and just 12.71% affirmed that they were used. It is clear that the majority of respondents chose to be neutral, which could

mean they are unaware of the existence of web-based technologies for KM or simply do not know if the technologies are used. Furthermore, all the universities failed to reveal the availability and usage of the web-based system as just 27.78% of the respondents from GTUC, 14.81% respondents from UPSA and 8.22% respondents from UG agreed that they were used at their universities.

#### 5.2.8.11 CD/DVD/VCD

The aim of the researcher was to discover if these tools were used to facilitate teaching and learning at the universities. Forty-six (38.98%) of the respondents were neutral (uncertain), while 40 (33.90%) agreed and 32 (27.12%) disagreed. However, the majority of respondents from GTUC (50%) and as little as 37.04% respondents from UPSA and 28.77% respondents from UG said they used CD/DVD/VCD for teaching and learning. These results show that there needs to be more awareness on the use of CD/DVD/VCD as a KM system at the universities.

#### 5.2.8.12 Comments on Knowledge Management Technologies

The respondents were given the opportunity to provide comments on KM technologies, these are listed below.

- The internet bandwidth needs to be improved.
- The use of the intranet for internal communication and knowledge sharing should be encouraged.
- The use of the e-mail for internal communication and knowledge sharing should be encouraged.
- Technology must be integrated into teaching and research on campus.
- Management needs to invest more into the improvement of the available ICT infrastructure.
- Staff must be willing to learn new and emerging technologies.
- The universities must ensure that employees' time is well spent by implementing technologies that contain resources that deliver value and which are easy to navigate.
- The technologies should enable streamlining and communication of knowledge on a widespread scale to all staff.
- Staff should be trained to adapt to technologies for teaching and instruction purposes.
- Ways to integrate technology into day-to-day work activities must be promoted.

### 5.2.9 Strategies for Knowledge Creation and Sharing

KM systems and practices in universities can be enhanced if strategies such as e-learning, communities of practice, coaching and mentoring as well as storytelling are adopted. Responses were elicited from the participants on the strategies that the universities use in managing and safeguarding knowledge. This was relevant, as it would enable the researcher to address and find solutions to the fifth objective of the study: to identify and assess the strategies adopted by the universities to manage and safeguard knowledge at the universities.

#### 5.2.9.1 E-learning

E-learning has become an important part of society today, comprising learning through the use of technologies and an extensive array of digitisation approaches, components and delivery methods. This section seeks to establish how e-learning was used to promote KM at the universities, it discusses the option and use of e-learning systems and facilities.

##### 5.2.9.1.1 Adoption and Practice of E-learning

The researcher aimed to gain an understanding of the adoption and practice of e-learning as a strategy for managing and safeguarding knowledge at the universities. The responses are reflected in figure 5.21 below.

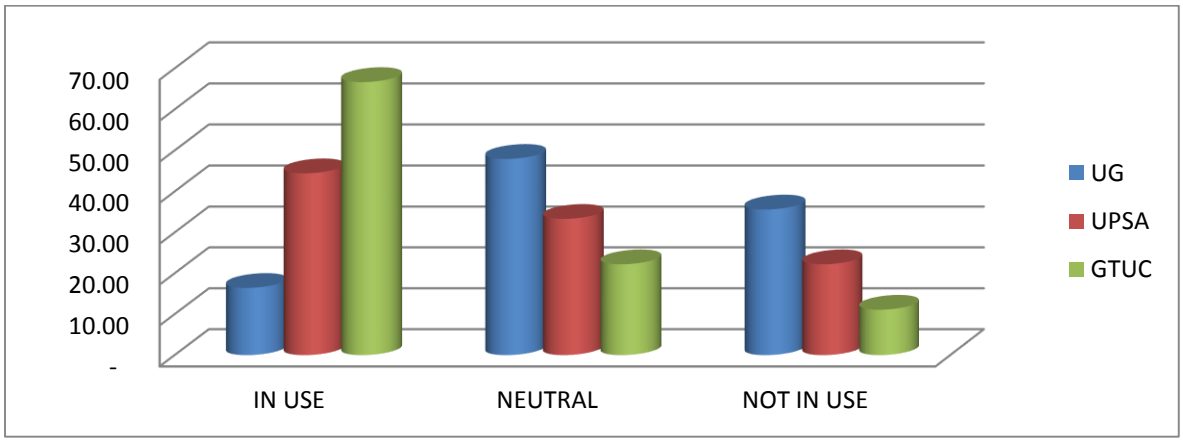


**Figure 5.21: E-learning adoption and usage**

Source: Field data (2015).

The researcher also wanted to discover if there were systems and facilities in place to facilitate e-learning. E-learning systems should provide knowledge to instructors and students who are partially or completely geographically disperse. The study reveals a result similar to the earlier result on e-learning adoption in the universities. That is, 48 (40.68%) of the respondents were not aware (neutral), 36 (30.51%) responded affirmatively and 34 (28.81%) disagreed. However, GTUC had an above average positive response rate of 66.67%, while UPSA had a rate of 44.44% and UG had as little as 16.44%. These results indicate that the use of e-learning to manage and safeguard or facilitate knowledge creation and sharing at GTUC was much higher and better that UPSA and UG.

#### 5.2.9.1.2 E-learning Systems/Tools

There are several systems/tools that are used to facilitate e-learning. The respondents were asked to outline some of the systems or tools used in their universities. The respondents outline the following systems/tools:

**University of Ghana**

- PowerPoint presentation
- E-library
- E-mail
- CD/DVD/VDC
- E-database/journals
- Online registration systems
- Web 2.0
- WhatsApp
- SMS
- Dropbox

**University of Professional Studies, Accra**

- PowerPoint presentation
- E-library
- Moodle (open source learning management systems/platform)

- E-mail
- CD/DVD/VDC (video and audio presentations)
- Search site/engine (google, yahoo, etc.)
- Computer/laptop
- E-database/journals
- Teleconferencing
- WhatsApp
- SMS
- Dropbox

**Ghana Technology University College**

- PowerPoint presentation
- E-library
- E-mail
- Blogs
- Wiki
- Search site/engine
- Slide share
- E-database/journals
- Online registration systems
- Online syllabus and course management system
- Online sharing of materials among students
- Teleconferencing
- Internet and Web courses
- Keeping track of grades on assignments and tests online
- Turnitin
- Web 2.0
- WhatsApp
- SMS

These systems/tools listed by the respondents indicate that several systems are available at the universities for knowledge creation and sharing, the majority of which are open source systems.

#### 5.2.9.1.3 Assessing and Upgrading the E-learning Systems

As with any system, e-learning systems must undergo periodic assessment and upgrading. Creating an e-learning system is an integral part of any learning organisation. However, even the most well-planned and carefully implemented e-learning system will fall short of expectations if not assessed and maintained. The respondents were asked to indicate if the e-learning systems were evaluated and updated periodically. The responses revealed that as many as 47 (39.83%) were neutral, 45 (38.14%) said "No" and 26 (22.03%) said "Yes". The results further showed that the individual universities were unable to evaluate and upgrade the e-learning systems.

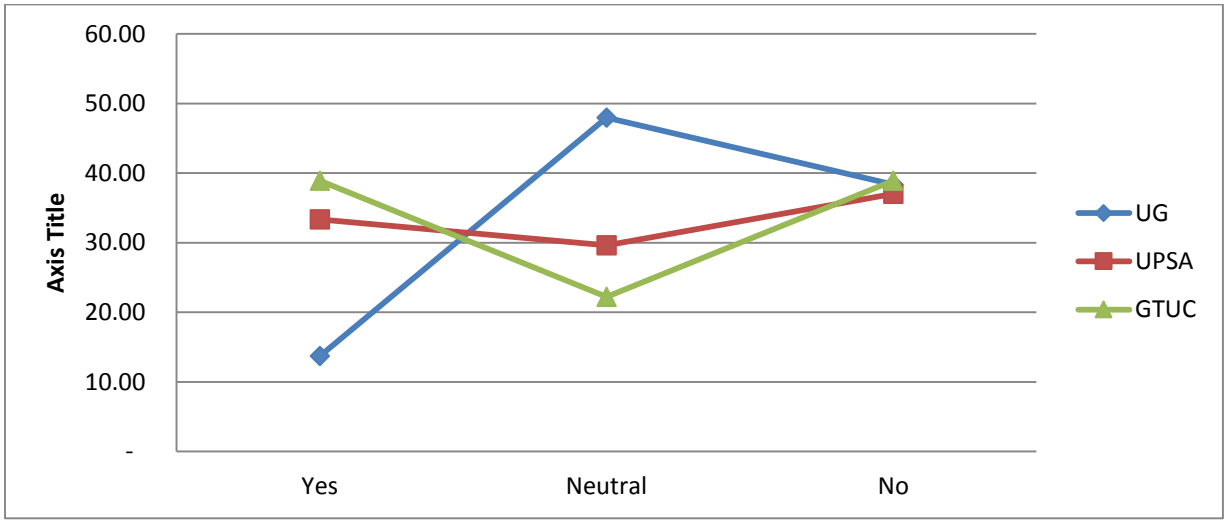


**Figure 5.22: Evaluating and updating e-learning systems**

Source: Field data (2015)

From figure 5.22 it is clear that, of the respondents, 47.95% from UG, 29.63% from UPSA and 22.22% from GTUC were unaware if the e-learning system underwent periodic assessment and upgrading, while 38.89% from UG, 38.89% from GTUC and 37.04% from UPSA responded negatively and 38.89% respondents from GTUC, 33.33% respondents from UPSA and 13.70% respondents from UG responded "Yes".

#### 5.2.9.2 Communities of Practice

CoPs serve as a strategy for managing knowledge in organisations. A CoP is a group of people who have worked together for a period and share a common sense of purpose and desire to gain knowledge from each other (Wenger, 2004). The researcher wanted to establish the extent and manner in which the universities exploited their forums in sharing knowledge, hence, the investigation into CoPs at the universities as a people-based, knowledge sharing and dissemination mechanism.

##### 5.2.9.2.1 Understanding and Belonging to Communities of Practice

The researcher sought to discover whether the respondents understand the concept of CoPs. This question is relevant, as the respondents' understanding of the concept would enable them to appreciate and respond to the practice of CoPs as a KM strategy. From the responses, 27.97% of the respondents said "Yes" while 72.03% of the respondents said "No", indicating the level of understanding of the concept of CoPs at the universities were very low. The positive responses from the individual universities consist of 44.44% (GTUC), 37.04% (UPSA) and 20.55% (UG) while the negative responses were 79.45% (UG), 62.96% (UPSA) and 55.56% (GTUC).

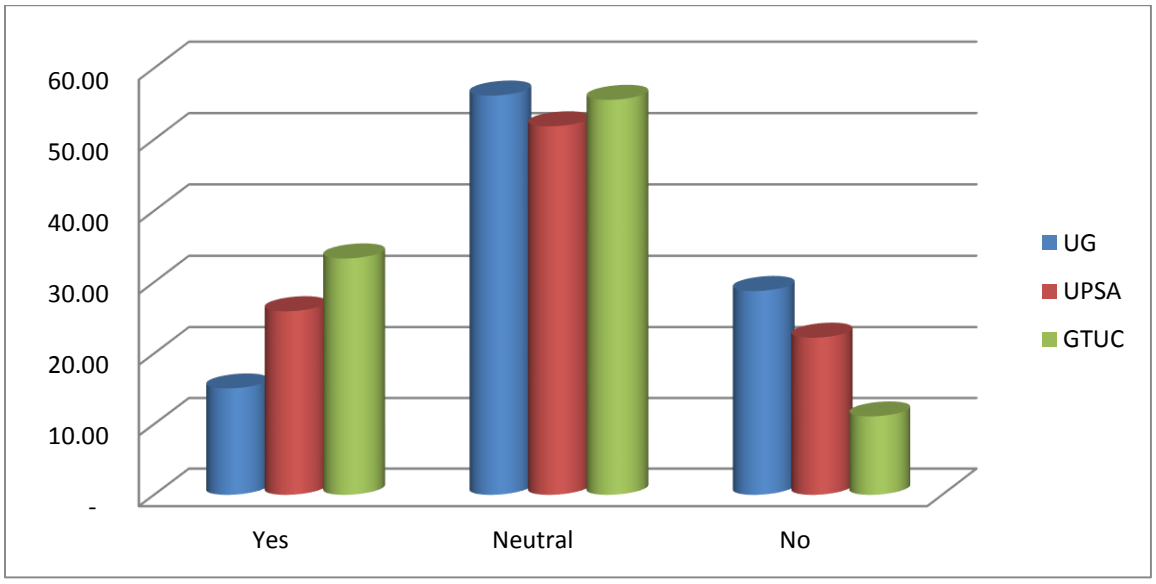


**Figure 5.23: Belonging to CoPs**

Source: Field data (2015)

Additionally, the respondents were asked whether they belonged to any CoPs: 65 (55.08%) of the respondents were neutral (unaware), 25 (20.34%) said "Yes" and 29 (24.58%) responded "No", suggesting that more than half of the respondents do not belong to any CoP. The positive responses from the individual universities consist of 33.33% (GTUC), 25.93% (UPSA) and 15.07% (UG) while 28.77% (UG), 22.22% (UPSA) and 11.11% (GTUC) were the negative responses. The neutral responses include 56.16% (UG), 55.56% (GTUC) and 51.85% (UPSA) respectively. These findings suggest that more than half of the respondents do not belong to any CoPs.

#### 5.2.9.2.2 Existence of Informal Forums to Create and Share Ideas and Insights

When asked if there were informal forums (during work-sessions, in corridors, or even during tea or lunch breaks) within the universities, where members share ideas and insights, 105 (88.98%) said "Yes", while 13 (11.02%) said "No". The positive responses from the individual universities consist of 94.44% (GTUC), 92.59% (UPSA) and 86.30% (UG), while 13.70% (UG), 7.41% (UPSA) and 5.56% (GTUC) constitute the negative responses. These results show that there were informal forums at the universities for the creation and sharing of ideas and insights.

#### 5.2.9.2.3 Systems or Tools to Support Communities of Practice

Technologies have become more available to expand opportunities for CoPs. When asked to state whether there are systems to support CoPs at the universities, the responses were not encouraging, as 39.83% of the respondents said "No", 38.14% said "Yes" and 26 22.03% were neutral (unaware). The positive responses from the individual universities consist of 44.44% (GTUC), 44.44% (UPSA) and 34.25% (UG) while 42.47% (UG), 37.04% (UPSA) and 133.33% (GTUC) were the respondents who said "No". The neutral responses include 23.29% (UG), 22.22% (GTUC) and 18.52% (UPSA).

#### 5.2.9.2.4 Communities of Practice Supporting Knowledge Management

CoPs offer new opportunities for KM and learning processes by using new forms of interaction within teams (members of CoPs). The researcher asked the respondents if CoPs support the KM process at the universities, 60 (50.85%) were neutral, while 36 (30.51%) said "No" and 22 (18.64%) said "Yes". The positive responses from the individual universities consist of 25.93% (UPSA), 22.22% (GTUC) and 15.07% (UG) while 28.77% (UG), 33.33% (UPSA) and 33.33%

(GTUC) were the respondents who said "No". The neutral responses include 58.16% (UG), 44.44% (GTUC) and 40.74% (UPSA). These findings suggest that the CoPs rarely supports KM processes at the universities.

#### 5.2.9.3 Coaching and Mentorship

Coaching and mentorship of potential knowledge experts and newly recruited staff is considered one of the major strategies to manage and safeguard knowledge in organisations. This was exactly the case as responses show that 90 (78.81%) agreed, while 13 (11.02%) were not aware and 12 (10.17%) said they were not used. According to the results, the use of coaching and mentorship as a KM strategy was more effective at GTUC (88.89%) that UPSA (81.48%) and UG (75.34%). With the majority agreeing that coaching and mentorship served as a strategy for managing knowledge, efforts need to be made to increase the practice of KM.

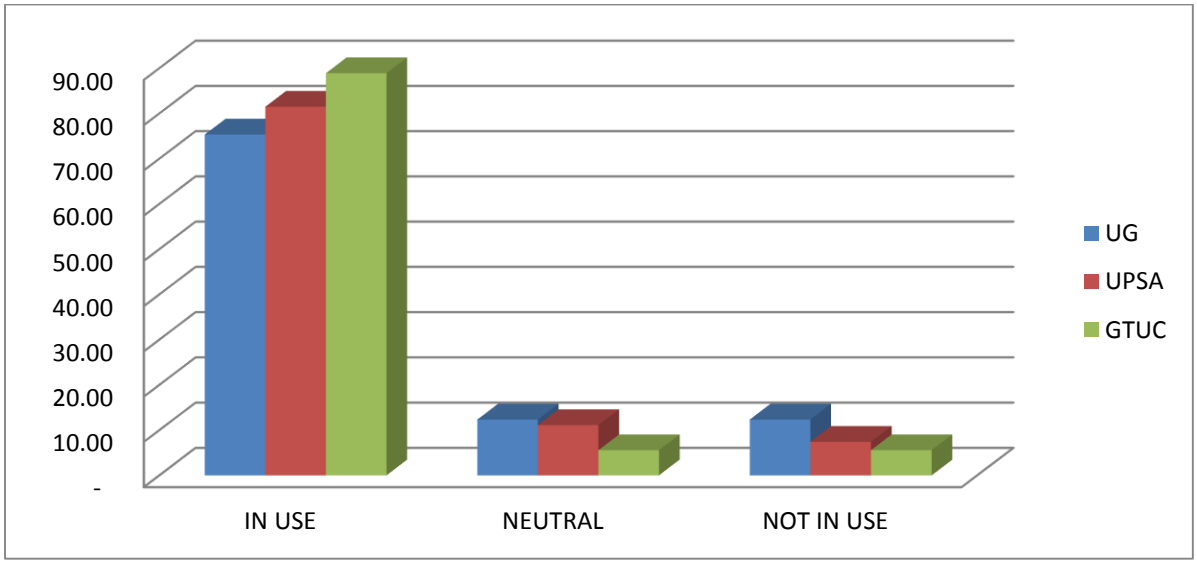


**Figure 5.24: Coaching and mentorship**

Source: Field data (2015)

#### 5.2.9.4 Storytelling

Storytelling is regarded as one of the most effective strategies for managing knowledge in organisations. The respondents were asked to indicate if storytelling was used as a KM strategy at the universities, 46 (38.98%) agreed, while another 46 (38.98%) were neutral and 26 (22.03%) expressed a negative opinion. At the individual university level, 40.74% (UPSA), 38.89% (GTUC)

and 38.36% (UG) said they were not used, while 41.10% (UG), 38.89% (GTUC) and 33.33% (UPSA) were neutral. In addition, 25.93% (UPSA), 22.22% (GTUC) and 20.55% (UG) also said they were not used. The results imply that most employees disagreed that storytelling is used as a KM strategy at the universities.

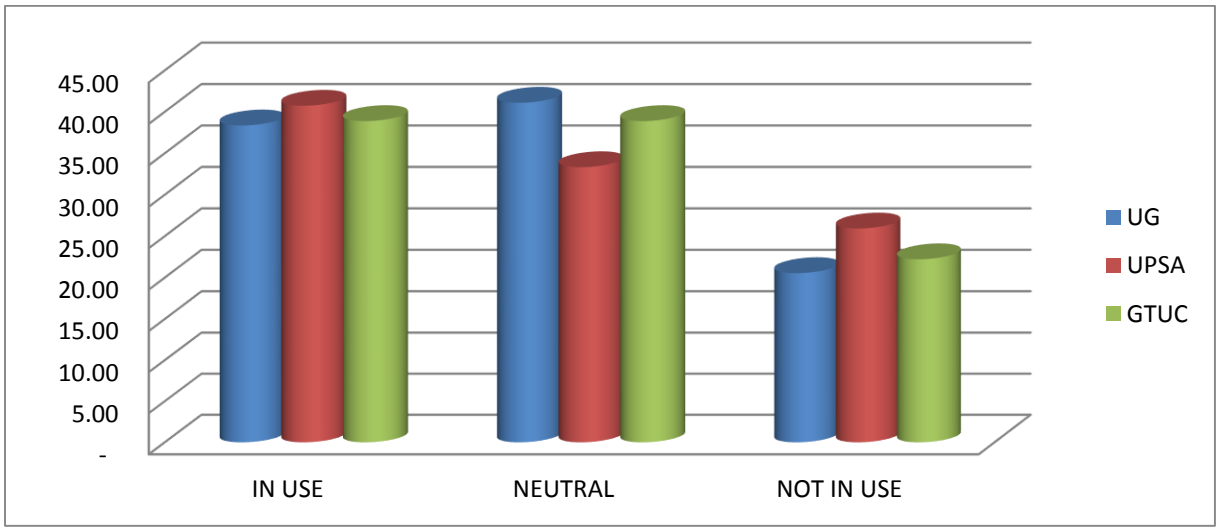


**Figure 4.25: Storytelling**

Source: Field data (2015)

On KM strategies, the respondents were also asked to outline some of the strategies that the universities adopted to manage and safeguard knowledge. Below are some of the strategies mentioned (in decreasing order of frequencies).

**UG**

- Training, development and education
- Motivational aids and incentives
- Knowledge cafes
- Telephone conversation
- Apprenticeship
- Succession planning
- Rotation and mobility of employees
- Workshops

**UPSA**

- Training, development and education
- Motivational aids and incentives
- Exit interviews
- Face-to-face interactions
- Development and sharing of experiences
- Succession planning
- Workshops
- Joint problem-solving
- Joint decision-making
- Video-conferencing

**GTUC**

- Training, development and education
- Exit interviews
- Knowledge cafes
- Succession planning
- Workshops
- Joint decision-making
- Video-conferencing

Finally, on KM strategies, the respondents were given the opportunity to provide comments on KM technologies. The following were their comments:

- E-learning should be encouraged among the staff.
- Facilities to support e-learning should be deployed.
- Membership to professional associations and groupings must be encouraged among the staff.
- Staff must be oriented on these strategies since some are unaware of them.

- More potential and intelligent young graduates should be identified and mentored to take over from the older and retiring experts.
- Informal groupings should be regulated.
- Storytelling should be reintroduced to promote knowledge transfer to the younger generations.

### 5.2.10 Assessing the Impact of Knowledge Management Systems

One of the major objectives of the study is to determine the impact of the KM systems on the universities. Questions were posed to the respondents to ascertain the level of impact KM activities have on the universities and the results are presented below.

#### 5.2.10.1 Impact of Knowledge Management on the Array of Programmes/Courses

The respondents were asked to indicate whether KM practices at the universities have enabled the universities to widen the array of programmes offered. The majority of the respondents (57.63%: 7.63% strongly agreed and 50% agreed) agreed, 38 (32.20%) were neutral and 12 (10.17%: 8.47% disagreed and 1.69% strongly disagreed) expressed a contrary opinion.

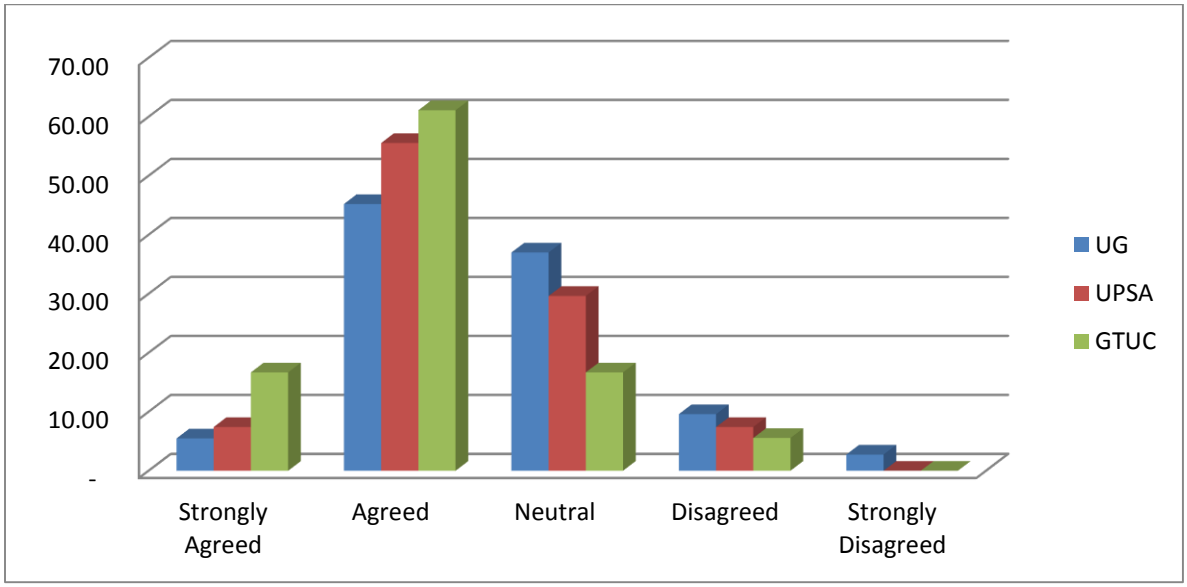


**Figure 5.26: KM practice helping widen the array of programmes**

Source: Field data (2015)

Comparatively, more respondents from GTUC (77.78%: 16.67% strongly agreed and 61.11% agreed) conveyed a positive response followed by UPSA (62.96%: 7.41% strongly agreed and 55.56% agreed) and UG (50.68%: 5.48% strongly agreed and 45.21% agreed). However, some of the respondents disagreed, these include 12.33% (9.59% disagreed and 2.74% strongly disagreed) from UG, 7.41% from UPSA and 5.56% from GTUC respectively. In addition, the neutral positions include 36.99% from UG, 29.63% from UPSA and 16.67% from GTUC.

#### 5.2.10.2 Impact of Knowledge Management on Decision-making

The researcher aimed to discover if KM has helped or improved decision-making at the universities. The responses are as follows: 62 (52.54%) agreed, 33 (27.97%) were neutral, 10 (8.47%) disagreed, 9 (7.63%) strongly agreed and 4 (3.39%) strongly disagreed that KM has helped in decision-making at the universities. In comparative terms, more respondents from GTUC (66.67%: 11.11% strongly agreed and 55.56% agreed) believed KM has helped in decision-making at the university than from UPSA (59.26%: 7.41% strongly agreed and 51.85% agreed) and UG (58.90%: 6.85% strongly agreed and 52.05% agreed). Additionally, 13.70% (9.59% disagreed and 4.11% strongly disagreed) respondents from UG, 11.11% (7.41% disagreed and 3.70% strongly disagreed) from UPSA and 5.56% of UG respondents expressed a negative response, while 29.63% (UPSA). 27.78% (GTUC) and 27.78% (UG) respondents were neutral.

#### 5.2.10.3 Impact of Knowledge Management Systems on Efficiency

The researcher asked the respondents if the KM systems have helped to improve efficiency at the universities. The responses revealed that 60 (50.85%) agreed, 38 (32.20%) were neutral, 12 (10.17%) disagreed, 8 (6.78%) strongly agreed and 1 (0.85%) strongly disagreed. Comparatively, knowledge has helped to improve efficiency at GTUC (66.67%: 11.11% strongly agreed and 55.56% agreed) more than UPSA (62.96%: 7.41% strongly agreed and 55.56% agreed) and UG (53.42%: 5.48% strongly agreed and 47.95% agreed). Similarly, 11.11% of GTUC respondents, 11.11% of UPSA respondents and 10.96% (9.59% disagreed and 1.37% strongly disagreed) of GTUC respondents expressed contrary opinion while 35.62%, 27.78%and 25.93% from UG, GTUC and UPSA took neutral positions respectively. These results indicate that KM systems helped to improve efficiency at the universities.

### 5.2.10.4 Impact of Knowledge Management on Teaching, Research and Learning

The respondents were asked to indicate whether KM practice has helped to improve the quality of teaching, research and learning at the universities. The majority of the respondents (67.80%: 6.78% strongly agreed and 61.02% agreed) agreed, 22.88% were neutral and 9.32% (7.63% disagreed and 1.69% strongly disagreed) expressed a contrary opinion. Comparatively, the positive responses consist of the following: 77.78% (11.11% strongly agreed and 66.67% agreed) from GTUC, 66.67% (7.41% strongly agreed and 59.26% agreed) from UPSA and 65.75% (5.48% strongly agreed and 60.27% agreed) from UG.

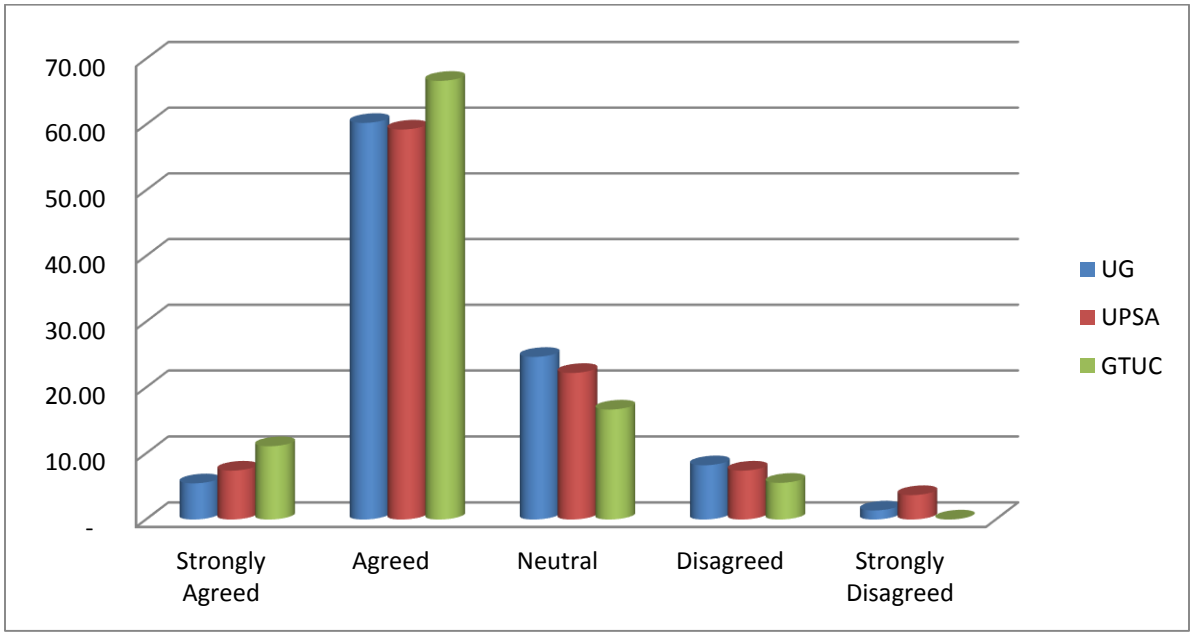


**Figure 5.27: Impact of KM on teaching, research and learning**

Source: Field data (2015)

However, some of the respondents disagreed; these included 11.11% (7.41% disagreed and 3.70% strongly disagreed) from UPSA, 9.59% (8.22% disagreed and 1.37% strongly disagreed) from UG and 5.56% from GTUC. The neutral positions included 24.66% from UG, 22.22% from UPSA and 16.67% from GTUC.

### 5.2.10.5 Impact of E-learning on the Universities

The researcher aimed to discover if e-learning had a positive impact on the universities. Eighty (67.80%: 7.63% strongly agreed and 60.17% agreed) affirmed that e-learning had a positive impact on the universities, 25 (21.19%) were neutral and 13 (11.02%: 8.47% disagreed and 2.54% strongly disagreed) expressed a contrary opinion. Comparatively, 77.78% (11.11% strongly agreed and 66.67% agreed) of the positive responses were from GTUC, 70.37% (11.11% strongly agreed and 59.26% agreed) were from UPSA and 64.38% (5.48% strongly agreed and 58.90% agreed) were from UG. Additionally, 12.33% (9.59% disagreed and 2.74% strongly disagreed) respondents from UG, 11.11% (7.41% disagreed and 3.70% strongly disagreed) from UPSA and 5.56% of GTUC respondents expressed negative responses. 23.29% (UG), 18.52% (UPSA) and 16.67% (GTUC) respondents were neutral.

### 5.2.10.6 Impact of Communities of Practice on the Universities

The researcher asked the respondents if CoPs have a positive impact on the universities. The responses reveal that 49 (41.53%) were neutral, 40 (33.90%) agreed, 18 (15.25%) disagreed, 8 (6.78%) strongly agreed and 3 (2.54%) strongly disagreed. These results indicate that the majority of respondents chose to be neutral, which could mean they might not have been aware that CoPs can have any impact on the universities.

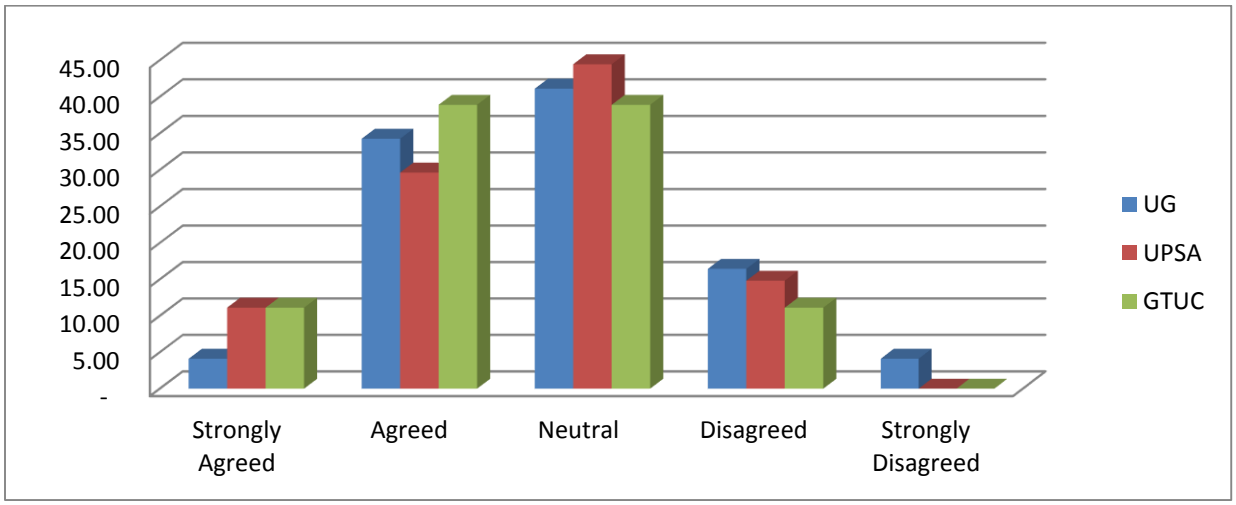


**Figure 5.28: Impact of CoPs on the universities**

Source: Field data (2015)

Comparatively, 50% (11.11% strongly agreed and 38.89% agreed) of the positive responses were from GTUC, 40.74% (11.11% strongly agreed and 29.63% agreed) were from UPSA and 38.36% (4.11% strongly agreed and 34.25% agreed) were from UG. Similarly, 20.55% (16.44% agreed and 4.11% strongly disagreed) of UG respondents, 14.81% of UPSA respondents and 11.11% of GTUC respondents expressed contrary opinions, while significant proportions of 44.44%, 41.10% and 38.89% respondents from UPSA, UG and GTUC, respectively, were neutral.

### 5.2.11 Critical Success Factors of Knowledge Management Systems

One of the objectives of this study was to determine the factors that contribute to the effectiveness (success) of KM systems at the universities. The concept of critical success factors denotes that, in each branch and in each area of an organisation's activities, a number of factors exist which determine its success. According to Mostert and Snyman (2007), KM can provide significant advantages to organisations if proper and functioning organisational processes, suitable structures, strategies and favourable working environments support them. Typically, critical success factors identified in this survey include: leadership, strategy, culture, information technology infrastructure, people and others. The respondents could select more than one factor, the results are shown in figure 5.29 below.

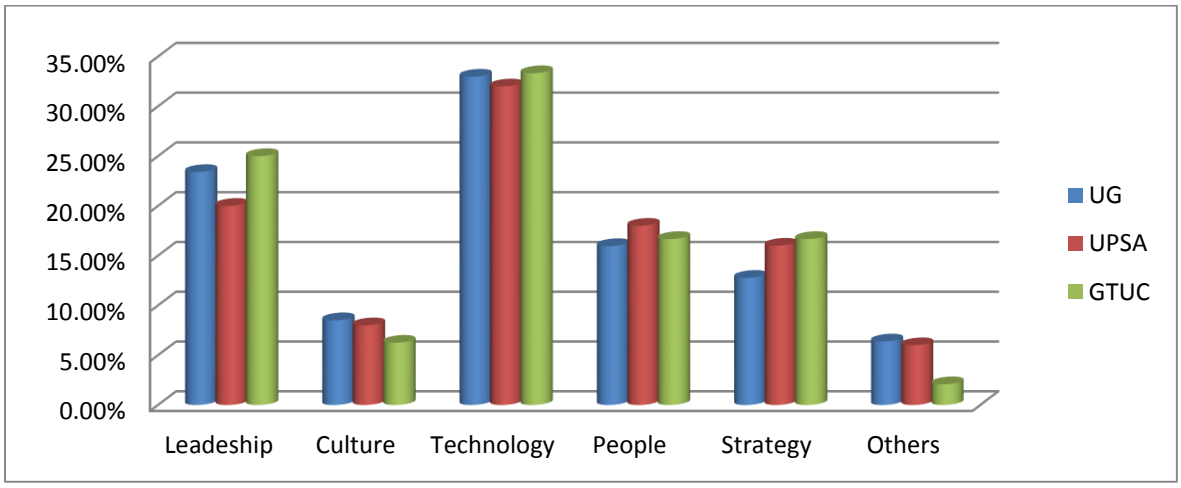


**Figure 5.29: Critical success factors of KM systems**

Source: Field data (2015)

As seen in figure 5.29, technology was reported to be the most significant contributing factor to the effectiveness of KM systems at the universities with 60 (31.25%), followed by leadership (21.35%), people (16.67%), strategy (15.10%) and culture (9.38%).

#### 5.2.11.1 Leadership

Without the commitment and support from the leadership of organisations, KM and other courses of action cannot be followed or practiced. Hence, leadership plays a major role in the practices of KM. In this study, leadership constituted a success factor of 21.35% toward the implementation of KM systems in the universities. The results further show that, according to the respondents, the leadership's contribution to the success of KM implementation at UG (23.40%) was more than that at UPSA (20%) and GTUC (18.75%). The respondents further indicated that the critical factors that contributed to leadership's success at the universities include: leader's experience and appreciation of knowledge and KM at the universities, commitment to promote KM, willingness to create and share their knowledge freely, continuous learning and seeking new knowledge and ideas.

#### 5.2.11.2 Organisational Culture

Culture plays a vital role in all organisations. Culture recorded the least success factor to KM systems at the universities with only 9.38% of the respondents selecting culture as a critical success factor. At the individual university level, only 12.50% respondents from GTUC, 8.51% respondents from UG and 8% respondents from UPSA believed organisational culture was a critical success factor to the successful implementation of KM systems.

#### 5.2.11.3 Information Technology

Without suitable information technology (IT) infrastructure/tools, KM cannot be practiced, as IT is a foremost enabler for KM practices. From the responses it was found that the highest contributing factor to the success of KM systems at the universities was seen as ICT infrastructure (31.25%). At the individual university level, ICT infrastructure at UG contributed to 36% of success factors to KM systems implementation while UPSA was 35% and GTUC was 29%.

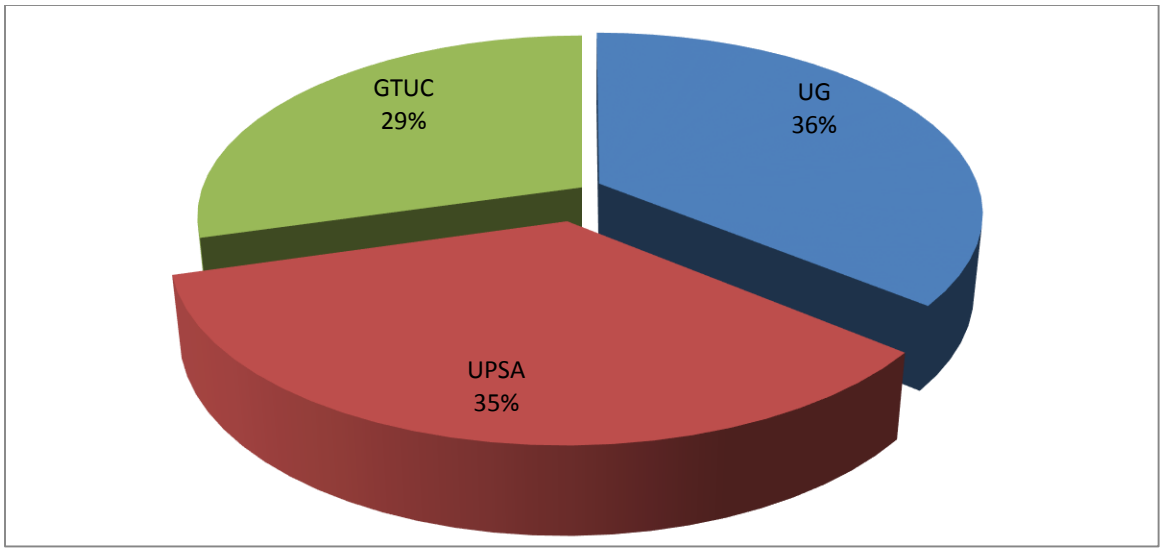


**Figure 5.30: Information Technology**

Source: Field data (2015)

#### 5.2.11.4 Strategy

Without proper strategy, any plan will fail. From the responses, this factor recorded a significant contribution of 15.10% to the success of KM systems at the universities. At the individual university level, strategy as a critical success factor at GTUC was 18.67% while it was 16% at UPSA and 12.77% at UG.

#### 5.2.11.5 People (Human Resource Management)

Knowledgeable people who also know the importance of creating and sharing knowledge are important for KM practices. This factor consists of all the dedicated knowledge creators, experts, users, managers, librarians and so on. The results show that 16.67% of the success factor of the KM systems at the universities was attributed to the people factor. At the individual university level, UPSA was at 18%, while GTUC recorded 16.67% and 15.96% at UG.

### 5.2.12 Factors that Inhibited Knowledge Management Processes

The respondents outlined the factors that inhibit the successful implementation of KM systems at the universities as: the absence of strong and effective leadership, culture and technology. This was in line with one of the objectives of this study: to identify the factors that inhibit the successful implementation of KM systems at the universities.

#### 5.2.12.1. Leadership

Nonaka and Takeuchi's (1995) organisational knowledge conversion theory views the interaction processes of tacit and explicit knowledge as an essential feature in KM in an organisation and, therefore, also at universities. The responses show that interaction and collaboration among the staff were not effective. The factors identified by the respondents are as follows:

- Lack of trust among members.
- Lack of incentives and reward schemes for KM initiatives.
- Absence of assessing the cost and benefit of knowledge creation and sharing.
- Absence of a formal mechanism for knowledge storage.
- Absence of KM policies and plans.
- Knowledge creation is mainly in the form of hand-outs and project works.
- There is no restriction to the type and quantity of knowledge shared.
- Absence of a policy on articulating tacit knowledge into explicit concepts.
- Lack of research assistance (personnel to support teaching and research).
- Knowledge sharing mainly flows from top management to lecturers.
- Knowledge creation is not encouraged among students.
- Lack of awareness for creating and sharing knowledge.
- Lack of succession planning.
- Lack of interaction among employees.
- Poor standards and output of students.
- Lack of interactions and collaboration between departments.
- Limited academic workshops, seminars and training to enhance KM.
- Absence of collaboration between teaching and non-teaching staff.
- Lack of effective collaboration between staff and leadership.
- Lack of performance indicators and measurable benefits.
- Inadequate management support.
- Improper planning, design, coordination and evaluation.
- Inadequate skills of knowledge managers and workers.
- Improper budgeting and excessive costs.

- Loss of knowledge as a result of staff defection and retirement.

#### 5.2.12.2 Organisational Culture

Nonaka (1991) as well as Nonaka and Takeuchi (1995) state that the SECI and *ba* models play a crucial role in the creation, sharing and application of knowledge and/or finding new knowledge through interactions and collaborations with other individual systems. Nonaka (1994) and Kok (2003) also point out that bureaucratic structures are not conducive to the process of creating and sharing knowledge within the organisation, as only top management has the power and ability to create information. The culture of collaboration and interactions with other individuals and systems in the universities played a key role in inhibiting effective KM at the selected universities as evidenced in these responses:

- Fear to make mistakes in front of peers.
- Negative attitude towards learning.
- Problems with organisational culture.
- Improper organisational structure.

#### 5.2.12.3 Information Technological

Technology has provided new tools to better perform the activity of building knowledge capital. The respondents identified the lack of technology as a major inhibitor of KM at the universities as evidenced in their comments bellow:

- Poor technological infrastructure and system.
- Limited access to internet bandwidth and connectivity.
- Resistance to change (adoption of technology) by some senior staff
- Low level of computer and technological literacy among some faculty members.
- Cost of acquiring and implementing the systems.
- Improper implementation of technology.
- Non existence of platform and medium for knowledge creation and sharing among senior and junior members of staff.

These comments from the respondents suggest that there is a general reception of inadequacy of technology and infrastructure to support KM at the universities, which largely affected KM practices at the universities.

## 5.3 Presentation of Qualitative Findings

Face-to-face interviews were conducted with three purposively selected officers from each university who were not part of the survey. Prior to the commencement of each interview, the researcher ensured that the environment was suitable and explained the aim of the interview to the participants. The names or other personal details of participants were not recorded in order to assure anonymity and the interview questions were asked in chronological order. Additionally, none were quoted or identified specifically with any responses, only their ideas and opinions were recorded. The interview responses were used to better explore the nuances that could unfold in the survey questionnaire.

### 5.3.1 Characteristics of the Respondents

Nine individuals were interviewed. They were the registrars, librarians and IT directors of the selected universities.

### 5.3.2 Understanding the Knowledge Management Concept

Understanding the concept of knowledge and KM is a major step towards appreciating and implementing KM systems in universities. For the researcher to know the respondents' level of understanding the concept of KM, he asked them if they could briefly explain knowledge and KM in their own words. Their responses were as follows:

**UG interviewees' response:**

> Knowledge consists of information, skills, experiences, and intellectual assets of persons within an organisation. Its management is to enable the organisation make qualitative decision in the organisation. As such, when adopted and applied in the university's operation as a whole, it will transform the performance of the university.

**UPSA interviewees' response:**

> Knowledge is the awareness or understanding derived from information. If managed effectively in an organisation, it becomes a strategic tool that will propel it to success.

**GTUC interviewees' response:**

> Knowledge is power. It is information with understanding. Knowledgeable people form the asset base of an organisation. KM is a strategic tool for competitive advantage. KM encompasses information technology, information, and professionals with knowledge.

These results showed that there was a high level of understanding and appreciation of the concept of knowledge and KM at UG, UPSA and GTUC. The respondents gave precise and relevant responses that could be expected of staff working in the knowledge and information environment.

As mentioned previously, understanding the concept and being able to identify and distinguish between the various types of knowledge, is an essential step for KM. To extrapolate interviewees' understanding of the types of knowledge, they were asked to identify the types of knowledge available at the universities. The following are their responses:

**UG interviewees' response:**

> The types of knowledge that exist in the university are tacit and explicit. The type of knowledge that exists in individuals are the tacit, while those that are expressed and articulated in external sources, such as books and journals, are the explicit. UG values and appreciates all of them, more than the individual knowledge. The other types include embedded, internal, external and common knowledge.

**UPSA interviewees' response:**

> The types of knowledge that mainly exist are the tacit, explicit and embedded knowledge. Tacit knowledge is unarticulated knowledge, while explicit knowledge is articulated knowledge and embedded knowledge found in processes and culture. We also have the group knowledge, which is found among groups working together on a project, as well as individual knowledge closely associated with individual staff of the university.

**GTUC interviewees' response:**

> The types of knowledge that exist in the university are the tacit, explicit, individual, group and corporate knowledge. Tacit knowledge is found in the minds of staff and experts, while explicit knowledge is found in databases, memos, notes and documents. Individual knowledge is possessed and owned by individuals. Group knowledge refers to the knowledge owned by a group of individuals working as a team, and corporate knowledge refers to knowledge possessed and owned by the university.

### 5.3.3 Knowledge Management Processes

One of the objectives of the study was to evaluate the KM processes (i.e. acquisition, creation, capturing, retention, accessing and sharing) at the universities. The researcher asked the interviewees some questions in relation to the KM processes at the universities.

#### 5.3.3.1 Knowledge Acquisition

Knowledge is acquired from many sources in organisations. The respondents were asked to indicate the sources of knowledge at the universities and their responses showed that there were a variety of sources of knowledge acquisition at the universities.

**UG interviewees' response:**

> The main sources are the libraries, journals, textbooks, periodicals, databases, internet, and other corporate bodies and individual. It is also usually acquired through interactions with management, staff, students, and professors/experts in specific subject matters.

**UPSA interviewees' response:**

> Library, online systems and databases, journals, search engines, World Wide Web (www), lecturers, students, management, and external systems/database are the main sources of knowledge in the university.

**GTUC interviewees' response:**

> Knowledge at the university is from two main sources: internal and external sources. The internet, intranet, e-learning systems, library, databases, journals, publications, bulletins, minutes, reports, notices, notes, newsletters and staff (professional/experts) are the major

internal source. The external sources include databases and repository systems of other partnering institutions, external experts/professionals, hiring new staff (experts/professional) or acquiring the services of consultants.

#### 5.3.3.2 Knowledge Creation

The creation of knowledge and effective exploitation of the existing knowledge is an important process in KM. The interviewees were asked to indicate the knowledge creation processes and systems available at the universities. Their responses show that the staff of the universities created knowledge.

**UG interviewees' response:**

Knowledge creation is very critical to the success of every institution of higher learning, including this university, because our core activities involve teaching, research, innovation and learning. It comes in the form of publications (journals, hand-out, textbooks, etc.). However, some members of UG are conservative hence not too aggressive in knowledge creation.

**UPSA interviewees' response:**

Knowledge is created each time faculty members meet their fellows and students during lecture periods, trainings, workshops, seminars and conferences.

**GTUC interviewees' response:**

The university has tried, in terms of being creative in doing things through the developments of modern libraries and information resource centres, to promote KM practices. The expansion and development in infrastructure shows that the university is committed to innovation, creativity and improvement of KM processes at the university. All of these are aimed at creating a platform for knowledge creation among members of the university.

#### 5.3.3.3 Capturing Experts' Knowledge

Among many considerations for KM is the identification of individuals with expert skills in the universities. The researcher wanted to establish how the universities captured the knowledge of experts and the responses are as follows:

**UG interviewees' response:**

> There are mentorship and coaching programmes in our university. The university identifies potential scholars and leaders from a pool of students and staff (mainly junior staff), but with less experience and then assigns them to a senior and experienced staff who will mentor, coach and impart knowledge on them during project execution. The motivation and encouragement to write book and publish their research findings also serves as means of capturing expert knowledge.

**UPSA interviewees' response:**

> Incentives and rewards are awarded to professionals and experts for knowledge creation and sharing. This serves as means of capturing their expert knowledge. Expert knowledge is also captures through interviews, group and teamwork, and collaboration.

**GTUC interviewees' response:**

> Efforts to capture expert knowledge are done by motivating them to publish and come out with their research findings and innovations. It is also done through employee exchange programmes, staff rotation, lateral transfers and training. Teaching and research assistantship programmes for fresh graduates with the potential are mentored and coached.

The responses received suggested knowledge is captured from the staff of the universities. However, it was done through various approaches.

#### 5.3.3.4 Knowledge Retention

Universities all over the world, just as other organisations, are worried about losing the knowledge and expertise of its key employees. This is also the concern of Ghanaian universities, as they grapple with growing retirement trends and the current embargo on employment faced by the public universities, such as UG and UPSA. The interviewees were asked if knowledge is retained

and how it is retained. Their responses suggested that knowledge is retained at all the universities as outlined below.

**UG interviewees' response:**

> Yes, knowledge is retained at the university. This is done through contract extension, publication, mentorship, coaching as well as documentation of experiences and projects.

**UPSA interviewees' response:**

> Yes, knowledge is retained. It is done through re-engaging experts and keeping their knowledge in databases and books.

**GTUC interviewees' response:**

> Yes, knowledge is retained. There exist databases and systems, both at the departmental, library and university levels, through which knowledge is retained. An exit interview is conducted for staff leaving the university.

#### 5.3.3.5 Accessing Knowledge

The researcher was interested in establishing the ease of accessing knowledge at the universities. Interviewees were asked if knowledge is easily accessible at the universities. The responses were as follows:

**UG interviewees' response:**

> The available systems are user friendly and easily accessible by staff and students. There are also known experts and consultants who are consulted when the need arises. These experts and consultants are willing to share their experiences and understanding on subject matters with others

**UPSA interviewees' response:**

> Accessing knowledge has been made easy through meetings, conferences, workshops, seminars, trainings, etc. the library systems and databases are user friendly, open and easily accessible by all the staff and students of the university. Also, most of the lecturers are open and approachable by all the students.

**GTUC interviewees' response:**

> Knowledge is easily accessible by staff and students of the university. There are several systems and databases from which knowledge is accessed. In addition, there are known knowledge experts who are contacted for knowledge.

#### 5.3.3.6 Knowledge Sharing

To have an idea of the extent of knowledge sharing, questions were asked to find out if knowledge was shared among staff and across departments/schools. Their responses were as follows:

**UG interviewees' response:**

> Sharing of knowledge at the university is easy and the norm. It is usually done through lectures, meetings, conferences, workshops, notices, newsletters, journals, phone calls, SMS, memos, e-mail, website and on radio universe (campus based radio station).

**UPSA interviewees' response:**

> Staff do share knowledge among themselves either within the same department or across departments. The internet, phone, SMS, meetings, conferences, workshops, notices, e-mail, WhatsApp, memos, e-learning system, and publications are the major avenues for knowledge sharing at the university.

**GTUC interviewees' response:**

> Yes, staff are able to share all knowledge created or sourced from internally or external sources. Some of the available systems and platforms available for knowledge sharing at the university include internet, intranet, e-mail, WhatsApp, SMS, Facebook, LinkedIn, YouTube, meetings, conferences, notices, memos, Flickr, yellow pages, googledoc, twitter, Wiki, e-learning system, and the university's website.

### 5.3.4 Knowledge Management Leadership

Rylatt (2003) suggests that a successful KM system is attributable to exemplary leadership that values and shows commitment to innovation and continuous improvement. The third objective of this study was to identify the critical success factors of KM systems at the universities, one of

which is leadership. This section sought to discover if the leadership of the universities values knowledge as a strategic asset, to respond to the roles management/leadership plays in promoting KM at the universities, the policies the leaders have put in place to promote KM, how they motivate staff to create and share knowledge and so on.

#### 5.3.4.1 Knowledge as a Strategic Asset

The interviewees were asked if the leadership of the universities valued knowledge as a strategic asset. Their responses are presented below.

**UG interviewees' response:**

> Knowledge is power. Just as every organisation, the belief of the university interviewees' is that the use of information for decision-making is viewed as using knowledge. Knowledge empowers the individuals for efficiency and effectiveness, which will then help promote the university.

**UPSA interviewees' response:**

> Knowledge is recognised as an important strategic asset, hence, efforts to promote it at the university.

**GTUC interviewees' response:**

> The university has embraced the philosophy of KM as a strategic asset, central to our core services and process. All activities of the university are driven by the availability of knowledge.

The overall response shows that knowledge is recognised as a strategic asset at all the universities. This supports the views of Hyypia and Parjanen (2013:225), who posit that knowledge is the most valuable resource because it embodies intangible assets, routines and creative processes that are difficult to imitate.

#### 5.3.4.2 Knowledge Management Policies

If policies, procedures and processes of an organisation are not properly documented, it presents an opportunity for the loss of knowledge. The researcher was interested in establishing which

policies and rewards/incentives were available with regard to using and re-using knowledge, preservation of knowledge and assigning responsibilities to retain knowledge by the leaders.

**UG interviewees' response:**

> KM policies are scattered in many documents. They include employee handbook, quality assurance document, library handbook, students' handbook, statutes, and examinations policies. Some of the policies entail recalling retired professor and expert as consultants to mentor junior and less experienced employees. However, there is a KM policy working document for the university.

**UPSA interviewees' response:**

> There is no formal and written policy to guide KM practice at the university, even though KM is practice. The policies may be implied or embedded in other documents, or may be norms that guide KM practice. Example includes the famous "publish or perish" concept that urges faculty members to generate and publish their research findings.

**GTUC interviewees' response:**

> Policies on knowledge acquisition, creation, sharing and retention are being established. There is a policy of rewarding innovativeness among employees.

#### 5.3.4.3 Knowledge Management Promoters (Champions)

According to Cong and Pandya (2003), the presence of KM champions in organisations would enable an organisation to adopt the KM philosophy. Due to this, the researcher requested the respondents to indicate whether there were KM champions at the universities. Their responses were as follows:

**UG interviewees' response:**

> At the basic level, all staff (teaching and non-teaching) are to champion KM activities at the university. However, since the pro-vice chancellor through the vice chancellor is the head of academics and drives all academic work at the university, he is the main campaigner of KM at the university. He does so with the help of the librarian, ICT director, provosts, deans, and heads of departments of the university. Also, since the library is

regarded as the hub of information and knowledge of the university, the librarian becomes a principal KM champion of the university. The same applies to the director of technology services.

**UPSA interviewees' response:**

There is no appointed staff who is solely responsible for championing KM at the university. Any staff member who is involved in the creation of knowledge and support the sharing process could be regarded as a KM champion. With the background of the librarian and IT director, they can effectively play the role of championing KM at the university. Also, since all faculty members are to embark on research, publication, and teaching, they can also be said to play an effective role in championing KM at the university.

**GTUC interviewees' response:**

The president and vice-president are the principal KM champions at GTUC. To ensure quality of knowledge delivery and academic work, the head of quality assurance play an important role in this regard. He can therefore also be regarded as a key player in the promotion of KM activities at the university. The director of research and innovation also promotes research and innovation among members of the university community. Finally, due to the activities of the librarian and faculty members as knowledge creators, they could also be regarded as KM champions.

The responses from all the interviewees suggest that all the staff were responsible for championing KM activities at the universities. The results also suggest other dedicated members who facilitate KM activities at the universities.

#### 5.3.4.4 Leadership Support and Motivation toward Knowledge Creation

Interviewees were asked to respond to the extent to which knowledge creation and sharing are encouraged and supported by the leadership of the universities. They were also asked whether leaders were open and freely interacting with the staff of the universities. The responses obtained show that management support KM activities at the universities. Below are their responses:

**UG interviewees' response:**

Not all members of management freely interact with employees to learn from them. This could be as a result of the size of the university and the decentralised (collegian) system in practice. Thus, interaction with management is mainly at the college, school, and departmental level. They encourage and support KM activities by organising and sponsoring members to attend and present papers at conferences and seminars (internally and externally). There are research grants and support for staff who publish and engage in research.

**UPSA interviewees' response:**

The leadership supports and shares knowledge appropriately among employees and across departments. The management through the librarian have equipped the library with modern and current materials and information resources the support knowledge acquisition, creation, and sharing. Also, staff are made to participate in decision making and policy formulation processes at the university by making them members of various committees and boards and other meetings.

**GTUC interviewees' response:**

The management of the university easily and frequently interact and share knowledge with staff. This takes the form of meetings, workshops, trainings, and conferences. Management keep investing in ICT, library, and academic infrastructure to support KM at the universities. Through promotion, performance appraisal, and evaluation, substantial knowledge is retained and subsequently, management of the university are able to pay attention to knowledge and KM.

### 5.3.5 Knowledge Management Culture

In order to make KM initiatives work in practice, the culture of willingness to create and share knowledge must exist among the staff and leaders of the universities, along with a culture of openness and trust. The interviewees were asked if there existed a culture of openness, willingness and trust among the staff in their institutions, which promote KM at the universities and their responses were as follows:

**UG interviewees' response:**

> There is a natural culture of interaction and knowledge sharing among staff members. By virtue of the nature of the university, research, publication, and innovation is a natural phenomenon since assessments and promotion is mainly based on these. However, some of the staff and leaders of the university are not too open to others. These peoples are just not open and unwilling to create and share knowledge with others.

**UPSA interviewees' response:**

> There is a culture of acceptance of diversity, striving after perfection and professionalism, presence of learning and seeking for knowledge, creativity, and co-operation among members.

**GTUC interviewees' response:**

> There is a culture of team work, trust, tolerance, openness, and willingness to create and share knowledge. Staff are also motivated and rewarded for knowledge creation. However, some staff are still reserved and finds it difficult to share with others their expertise and skills.

These results showed that, according to the respondents, there is KM culture present at the universities. However, the universities practiced it in various ways. Additionally, the participants mentioned the absence of trust, openness and willingness to collaborate as hindrances to KM culture.

### 5.3.6 Knowledge Management/Information and Communications Technology

Technologies serve as a major source of support to KM in universities. Interviewees were asked if they thought there was a proper ICT infrastructure to support KM processes. Below are the responses received.

**UG interviewees' response:**

> Technology is key to the success of teaching, research, and learning. It is widely available for use by all members. Heavy investment in ICT infrastructure and the libraries have

significantly improved availability and easy access to information and knowledge resources. There are computers and ICT laboratories and support services at the libraries, departments, and schools of the university. The libraries have a dedicated IT unit with IT professionals who manages the IT support services at the libraries and assisting clients (library users) of the library acquire needed and relevant knowledge. However, the ICT infrastructure to support KM at the libraries and the university as a whole are not sufficient and strong enough. The authorities need to invest more into it, especially, investment into internet connectivity and networking of the departments.

**UPSA interviewees' response:**

ICT infrastructure and support services to drive KM are available. The library, students, staff, departments, and students services are largely supported by the ICT directorate of the university. However, more need to be done considering the size of the university and the role ICT plays in KM and the university as a whole.

**GTUC interviewees' response:**

Technology is the backbone of the university. The development and use of ICT is well appreciated. The university have invested heavily in ICT. There are separate and well-furnished student and staff computer labs with internet facility. There is a strong synergy between the library, ICT directorate, and the academic departments of the university to facilitate KM. However, more investment needs to be done to enable the university to meet its prime aim of becoming a centre of excellence in research, technology and innovation in Africa and beyond.

These responses showed that there was a strong presence and appreciation of technology at the universities, however, more needs to be done. This is discussed in detail in the next chapter of this study.

### 5.3.7 Systems/Facilities that Facilitate Knowledge Management

With choices of Internet, e-mail, intranet, groupware, telecommunication, memoranda, Weblogs, mobile technology, online/web-based learning system, boardrooms, mobile technology and CD/DVD/VCD, interviewees were asked to indicate whether these tools were used to facilitate

KM at the universities or not. In addition, they were asked to mention any other system or facilities that were used to facilitate KM at the universities. Their responses are as follows:

**UG interviewees' response:**

All are used to facilitate KM at the university.

**UPSA interviewees' response:**

All are used to facilitate KM at the university.

**GTUC interviewees' response:**

All are used to facilitate KM at the university.

### 5.3.8 Strategies for Knowledge Creation, Sharing and Safeguarding

KM systems and practices at universities can be enhanced if strategies such as e-learning, CoPs, coaching, mentoring and storytelling are adopted. Responses were sought from the interviewees on which of the strategies were used in promoting and safeguarding knowledge in their universities. Additionally, they were asked to indicate how these strategies were used to promote KM practices at the universities.

#### 5.3.8.1 Electronic Learning (e-learning)

Universities in Ghana are more accustomed to the traditional mode of instruction and knowledge delivery, however, with the emergence of ICT, the story is changing. The researcher sought to find out the respondents' understanding and usage of e-learning at the universities.

##### 5.3.8.1.1 Understanding and Use of the Concept of E-learning

The researcher sought to discover the respondents' level of understanding of the e-learning concept, as the staff level of understanding and appreciation of the concept determines the extent to which they could effectively use the system. Additionally, it was asked whether it was used at the universities to facilitate knowledge creation and sharing. Their responses are outlined below.

**UG interviewees' response:**

Yes, e-learning is used to facilitate knowledge creation and sharing. E-learning is the delivery of information, knowledge and learning with the assistance of interactive and electronic technology, whether offline or online.

**UPSA interviewees' response:**

Yes, e-learning is used to facilitate knowledge creation and sharing. E-learning essentially covers the use of computers and technology as a vehicle for knowledge exchange.

**GTUC interviewees' response:**

Yes, e-learning is used to facilitate knowledge creation and sharing. Quite simply, e-learning is electronic learning, and typically this means using computers or ICT systems to deliver part or all of a course/subject. It serves as a platform for interaction and collaboration between students and lecturers electronically either on campus or outside campus.

#### 5.3.8.1.2 E-learning Facilities

There are many tools that are used to facilitate e-learning in universities. The responses from UG, UPSA and GTUC respondents show that the current facilities being used to support e-learning are as follows:

**UG interviewees' response:**

PowerPoint presentation and projection, teleconferencing systems, e-mails, internet, databases, internet, search engines, DVD/VCD, e-library, computer/laptop, e-learning systems, e-journals, telephones, promoters, administrators, WhatsApp, e-books, etc.

**UPSA interviewees' response:**

PowerPoint presentation and projection, search engines, CD/DVD/VCD, e-library, e-database/journals, slide share, computer/laptop, good/strong internet systems and connectivity are needed. Other systems include e-learning systems, e-books, e-journals, Moodle, content managers, and content and system administrators.

**GTUC interviewees' response:**

> PowerPoint presentation and projection, e-mails, e-library with e-database/journals, teleconferencing, internet and web courses, blogs, course management system, keeping track of grades on assignments and tests online, Turnitin, Wiki, Moodle and WhatsApp.

These responses show that there are lot of systems used to facilitate e-learning at the universities, the majority of which are open source systems.

#### 5.3.8.1.3 Factors that Enhance E-learning Adoption

Various factors encourage and promote the adoption and use of e-learning in universities. The responses of the interviewees on which factors are utilised, are presented below.

**UG interviewees' response:**

> Access to technology, effectively functioning e-learning system, quality and experienced staff to manage the systems are the factors that could help enhance e-learning.

**UPSA interviewees' response:**

> Support from the university management, content creators and managers and support services for faculty members. The willingness to use the e-learning systems and availability of computers and technology to support e-learning are other factors that enhance e-learning adoption.

**GTUC interviewees' response:**

> There must be a clearly outlined strategy and vision to guide the usage and management of the e-learning system. Also management should provide enough funds to help acquire new and relevant technologies to support teaching, research and learning.

The respondents identified technology as the main factor that enhances the adoption and promotion of e-learning at the universities.

#### 5.3.8.1.4 Factors that Impact Negatively on E-learning Usage

Factors likely to have a negative impact on staff and student ability to participate fully in e-learning courses can be attributed to various issues. Respondents were asked to outline some factors that prevented from effectively using the e-learning systems. The following were their responses:

**UG interviewees' response:**

> The main factors that impede e-learning activities at the university are: limited technological infrastructure, limited access to computers and technological devices and resistance to change, especially by the older staff. Also is the absence of the face-to-face interaction between the lecturer/instructor and the students.Thisreduces the direct contact with the students, which is cardinal in the traditional learning. Finally, the low level of computer and technological literacy and awareness among some staff impede e-learning activities at the university.

**UPSA interviewees' response:**

> The e-learning system does not provide quick and effective feedback from the lecturers and other users. This makes learning via the e-learning system not attractive. There is also minimal support from management of the university, and the absence of content creators and managers. Thus, lecturers sometimes need support to enable them to effectively create and share knowledge via the e-learning system but have fail to get such support.

**GTUC interviewees' response:**

> The main challenge is the lack of interest from senior/older faculty members to fully participate and use the available technology and systems. There is also the problem of the cost of buying and implementing the technologies and supporting facilities for the e-learning systems.

These results show varied factors that impede e-learning at the universities. Prominent among them is the absence of technology, management support, awareness, interest and skills to use the system

#### 5.3.8.1.5 Impact of E-learning

A number of benefits are derived from e-learning in universities, as such, the interviewees were asked if e-learning had any impact on the universities and in what ways. Their responses were as follows:

**UG interviewees' response:**

> Most of our students and staff are just too familiar and comfortable with the traditional learning system for knowledge generation. It is therefore difficult to be sure of the impact of the e-learning on the university because we cannot guarantee that students and lecturers will engage sufficiently to lead to the success of the programme. However, to some of us who use the e-learning, we can confidently say it has improved our teaching, research, and knowledge delivery. We are able to easily deliver lecture notes and effectively interact and collaborate with our students. It make is easy for us to have access to our students.

**UPSA interviewees' response:**

> Even though the university has an e-learning system, it is yet to be fully utilised by the members of the university. Some members still prefer to use the traditional learning system than the e-learning system. However, the e-learning system is gradually making an in-roll in terms of usage. It has a positive impact on this university.

**GTUC interviewees' response:**

> The e-learning system has provided the opportunity for distance learning. Some of the programmes and courses are run via the e-learning system. It is more flexible, convenient, and a preferred model of learning for most workers outside the university and some of our staff.

These responses showed that the universities used many systems and facilities for e-learning as a KM strategy. In addition, e-learning had a positive impact on the universities by enhancing effective collaboration between students and lectures, however, there were mixed reactions on the factors that promoted or inhibited e-learning at the universities.

#### 5.3.8.2 Communities of Practice

One of the strategies to facilitate knowledge creation and sharing is through CoPs.

##### 5.3.8.2.1 Understanding the Concept of Communities of Practice

The interviewees were questioned on their level of understanding of CoPs. Their responses were as follows:

**UG interviewees' response:**

> CoPs consist of groups of individuals or professionals who come together to share and learn from each other either by face-to-face or virtually.

**UPSA interviewees' response:**

> CoP is the coming together of groups of people with common interest in a subject area and who interact regularly to learn how to do it better.

**GTUC interviewees' response:**

> CoPs consist of like-minded people who share a concern for something they do and who interact regularly to learn how to do it better.

These results show that there is a high level of understanding and appreciation of the concept of CoPs at UG, UPSA and GTUC. The respondents gave precise and relevant responses, which is expected of staff working in the knowledge and information environment.

##### 5.3.8.2.2 Forms of Communities of Practice

The researcher aimed at discovering the different forms that CoPs takes at the universities. Their responses are as follows:

**UG interviewees' response:**

> CoPs take the form of meetings at all levels of the university. There are senior common rooms that serve as a platform for knowledge sharing among senior staff members.

**UPSA interviewees' response:**

All forms of meetings (whether formal or informal) at the university that aims at knowledge creation and sharing serves as a CoP.

**GTUC interviewees' response:**

Meetings, workshops, conferences, seminars, and other social and formal gatherings of the university are the major forms of CoPs at the university**.**

These results show that there is a high level of understanding of the forms of CoPs at UG, UPSA and GTUC. The respondents gave precise and relevant responses, which is expected of staff working in the knowledge and information environment.

#### 5.3.8.2.3 Facilities/Tools that Facilitate Communities of Practice

Various tools and facilities support CoPs. The interviewees were asked to state which of these tools are used at the universities. Their responses are as follows:

**UG interviewees' response:**

People, common rooms, favourable environment and computers if necessary.

**UPSA interviewees' response:**

Office/room, experts, computers and internet connectivity.

**GTUC interviewees' response:**

People, venue (room), computers and internet connectivity.

These results showed that different tools are used by the universities to facilitate KM. These were both technological and human-based, as discussed in Chapter Two of this study.

#### 5.3.8.2.4 Benefits of Communities of Practice

Organisations are increasingly providing CoPs with resources to improve the exchange and flow of knowledge and information. The respondents were asked if CoPs have a positive impact on the universities and how. The responses are as follows:

**UG interviewees' response:**

> Yes. It provides a platform for deliberation, knowledge sharing and acquisitions, *and* decision-making.

**UPSA interviewees' response:**

> Yes. Staff of the university are able to express themselves and contribute to decision making processes of the university. This helps the university to take decisive decisions that will go a long way to improve the university's performance.

**GTUC interviewees' response:**

> Yes. CoPs enable the university to consult widely on pertinent issues before final decisions are made. Since the staff members feel part of the decision-making processes of the university, they tend to put in their best.

The responses showed that the concept of CoPs was well understood by the respondents and meetings served as the main form of CoPs at the universities. Additionally, there were facilities available that supported CoPsand had a positive impact on the universities in terms of decision-making.

### 5.3.8.3 Coaching and Mentorship

Coaching and mentorship of potential knowledge experts and newly recruited staff are considered major strategies for promoting and safeguarding knowledge in universities. The interviewees were asked whether these strategies were used to safeguard KM at the universities and how it was done. Their responses are as follows:

**UG interviewees' response:**

> Yes, the university uses coaching and mentorship as a strategy to facilitate and safeguard knowledge creation and sharing. National service persons are usually trained, coached, and mentored. Those who prove to be efficient and effective are either retain as support staff or encouraged to read their master's degree to be employed as assistant lecturers. These people are again coached and mentored. Again, those with more potentials are sponsored for their doctorate degrees. Senior research fellows and professors also coach and mentor young researchers on research skills and opportunities available to them and how to make good use of those opportunities.

**UPSA interviewees' response:**

> Yes, coaching and mentorship are some of the strategies adopted by the university to facilitate and safeguard knowledge creation and sharing. New recruits are assigned to senior staff or faculty members who will coach and mentor them. Those who display more potential are retained to also promote KM.

**GTUC interviewees' response:**

> Yes, coaching and mentorship serve as a strategy to facilitate and safeguard knowledge creation and sharing at the university. New recruits and national service personnel are assigned to senior staff or faculty members who will coach and mentor them.

These responses showed that UG, UPSA and GTUC adopted and used coaching and mentorship as a KM strategy. The respondents added that new recruits and junior members are assigned to senior members and knowledge experts.

#### 5.3.8.4 Storytelling

The interviewees were asked to indicate if storytelling was used as a KM strategy at the universities and how it was used. Their responses are as follows:

**UG interviewees' response:**

> Yes, we normally use storytelling during projects implementations and assignment of duties to junior staff. We try to narrate incidence and occurrences so they can learn from them.

**UPSA interviewees' response:**

> Yes, storytelling is used during group work execution. We do hold both formal and informal discussions among ourselves where experiences are shared through storytelling. This also serves as a major platform for impacting and sharing knowledge

**GTUC interviewees' response:**

> Storytelling normally takes place in our daily activities and knowledge sharing within and across departments of the university. In our normal and daily conversation, interaction, meetings, gathering, and execution of jobs, we share information and knowledge through storytelling. No organisation can do without storytelling.

Their responses showed that storytelling was used as a strategy to create, share and safeguard knowledge at all the universities.

### 5.3.9 Factors that Inhibit Knowledge Management Implementation

Members of organisations do not easily share information or knowledge with their peers due to a number of reasons. The interviewees, being knowledge officers at the universities, highlighted the following as the major barriers to KM at the universities.

**UG interviewees' response:**

- Inadequacy of ICT infrastructure and support services to aid KM.
- Inadequate financial support for research and innovation.
- Absence of dedicated knowledge champions.
- Inadequate incentives and rewards schemes for KM initiatives.
- Inadequate research assistants.

**UPSA interviewees' response:**

- Inadequacy of ICT infrastructure and support services to KM.
- Members are reluctant and unwilling to create knowledge through publication of textbooks, lecture handouts and publishing in journals due to the cost and time factors.
- Inadequate incentives and rewards schemes for KM initiative.
- Negative attitudes towards learning, research, innovations and publications.
- Fearing to make mistakes in front of peers.
- Low quality of students we recently admit. They simply refuse to learn and produce original knowledge. All they do is to embark on copy and paste.

**GTUC interviewees' response:**

- Inadequacy of ICT infrastructure and support services to aid KM.
- Absence of policies and plans that guarantee production of knowledge through research.
- Inadequate incentives and reward schemes for KM initiatives.
- The cost of knowledge creation (research, innovation and publication) is just too high. The government and corporate bodies need to support and invest more into these areas.

These responses show that there are many factors, which inhibit effective KM systems, implementation and practice in the universities. These are discussed in detail in the next chapter of this study.

### 5.3.10 Enhancing Knowledge Management Practice

At the end of the interviews, the respondents were asked to make some suggestions, recommendations or comments regarding improving KM at the universities. A summary of the suggestions is presented below.

**UG interviewees' response:**

- The libraries need to subscribe to more relevant and current resources
- The library system needs to be upgraded
- Improve on the ICT infrastructure, broadband/internet services, and systems
- E-learning and distance learning should be promoted and encouraged

- We need more knowledge experts; hence, embargo on recruitment of new employees by the government must be reconsidered and lifted.
- The research grant should be increased. It should also come on time to encourage research and publication among the staff
- The research centre needs to be equipped with modern tools and systems to enhance research.
- More experts to manage the technologies are needed

**UPSA interviewees' response:**

- The library must subscribe to more relevant and current electronic databases and journals.
- There must be adequate funding for research especially research in ICT, science, technology, and engineering.
- There should be enough rewards, incentives, and compensation for staff to encourage KM (creation, sharing, mentorship, coaching, and training).
- There is a need to formulate and implement policies and strategies to guide KM practices at the university.
- More seminars, training and workshops for knowledge creation and dissemination should be encouraged so that when the knowledgeable experts leave the university, those who remain will still remain with operational knowledge.

**GTUC interviewees' response:**

- ICT infrastructure needs to be improved
- There is the need to formulate and implement policies and strategies to guide KM practices at the university.
- Staff, management, and students need to acknowledge that KM is crucial and key to the success of the university
- Dedicated KM champions must be appointed
- The universities must establish strong partnership and collaborations with other institutions (corporate organisations) for research, innovation, and exchanged programmes and embrace aspects of advanced technology in other countries.
- There must be adequate reward and incentives to boost knowledge creation and sharing.

## 5.4 Conclusion

The main aim of the study was to assess the implementation of KM systems at the Ghanaian universities, in order to identify and recommend a suitable strategy for the institution. The researcher analysed and presented the data that was collected via questionnaires and interviews. The main trends and patterns in the data were discussed with reference to the research objectives and questions outlined in Chapter One of the study. In reporting the questionnaire findings, the use of Microsoft Excel 2010 enabled the presentation of results in graphical and tabular forms, whenever applicable, the actual words of interviewees were used to emphasise ideas as they were expressed.

The findings revealed that:

- The members of the universities understood and appreciated knowledge as a valuable, intangible asset.
- Tacit and explicit knowledge are the main types of knowledge available (created, shared and used) at the universities. Other types of knowledge available are: embedded, common, declarative, corporate, individual, and so on.
- There are substantial KM processes (acquisition, creation, sharing and retention) at the selected universities.
- There is some level of motivation and compensation for knowledge generation and dissemination by the leadership of the universities, even though it was found to be inadequate.
- The culture of willingness, openness and trust was present, though it is not adequate among the staff and management of the universities to ensure effective KM practice.
- Technologies (ICT infrastructure) such as computers, internet connectivity, support and access were adequately available to support KM activities at the universities. However, more needs to be done in terms of systems, training and policies, which would harmonise and standardise the use of ICT.
- Systems and facilities such as internet, intranet, teleconferencing, boardrooms, groupware, weblogs, e-mails, mobile technology, online/web-based learning systems and DVD/VCD/CD's were used to facilitate KM at the universities.

- The main strategies used to manage and safeguard knowledge were: e-learning, coaching and mentorship, storytelling and CoPs.
- The KM systems had a significant impact on the universities in terms of: improving the arrays of programmes offered, improving efficiency and decision-making, among others.
- KM technology, leadership, culture, strategy and human capital were identified as the main success factors to KM practice at the universities, though several other factors were also identified.
- The absence and poor practice of the success factors (lack of motivation and leadership support, poor and limited ICT infrastructure, absence of dedicated knowledge champions, lack of trust, etc.) were shown to inhibit successful KM systems at the universities.

The next chapter, Chapter Six, discusses the results of the study presented in Chapter Five.

# CHAPTER SIX
# INTERPRETATION AND DISCUSSION OF FINDINGS

## 6.1 Introduction

This chapter discusses the data that was analysed in Chapter Five. According to Neuman (2006:473), the discussion of research findings should be detached from the result itself, so that readers can examine the data and arrive at their own interpretations. The interpretation and discussions of findings are presented according to the themes of the objectives of the study. The general purpose of this study was to assess the implementation of KM systems in Ghanaian universities as well as the strategies that could be adopted to manage and safeguard knowledge as a competitive advantage and future use. The specific objectives of the study are to:

- identify the types of knowledge created, shared and used
- assess the KM processes (creation, capturing, retention and sharing)
- asses the KM enablers (leadership, culture, technology and strategy)
- determine the adopted strategies that promote and safeguard knowledge
- assess the KM system and facilities
- assess the impact of KM systems
- determine the critical success factors and inhibitors to the implementation of KM systems
- develop a framework for the successful implementation of KM systems

## 6.2 Demographic Profile of Respondents

The demographic information of respondents such as age, gender, qualifications, rank and departments from which respondents work, have an effect on the level of understanding and appreciation of knowledge as a strategic resource in universities. According to Boondao (2013: 23), there exist certain effects of these personal factors on managing knowledge in organisations, though they may not be statistically significant.

Universities all over the world face the retirements and resigning of some of its key and valuable knowledge experts. This requires a balance between new and less experienced recruits and outgoing (experienced) staff. The systems and strategies put in place by universities that manage and safeguard knowledge should be mindful of this balance and the transition of knowledge. There

is an indication from the survey that the majority of the respondents are below 60 years (see section 5.3.1.2), which means that the majority of the staff are in active service and are able to appreciate, create and manage knowledge. The age profile of employees, in a given sector or organisation, is very important to ensure that there is a continual cycle of younger and less experienced people gaining new skills and knowledge within an emerging career path and knowledge transfer from the experienced staff. This means that most of the staff were far from retiring, although there is the possibility of younger staff resigning to join other institutions, based on outside factors that are not applicable to this study.

The study revealed that UG, UPSA and GTUC have more male staff (68.56%) members than female staff members (31.44%). The lowest qualification for the respondents of the study is a bachelor's degree (10.17%), although the majority have a master's degree (55.08%). Additionally, it was indicated that there were a substantial number of doctoral degree (31.36%) holders. As established by Ismail and Yusof (2009:2), the lower the level of education, the less likely persons are to appreciate knowledge creation and sharing. The staff surveyed during this study, seem to have staff with the appropriate qualifications and educational backgrounds to enable them appreciate and manage knowledge effectively.

It was discovered that the majority of the respondents are still taking advanced degrees and courses (academic and professional). For instance, while those with bachelor's degrees were seen doing their master's degrees or other professional courses such as ACCA, CA, CIMA, CIM and so on, those with a master's degree (mainly faculty members) were also enrolled for their doctoral degrees (Section 5.2.1.3). This progression in education will be vital if the universities are able to implement KM systems and strategies, as its staff will gain more knowledge that will increase its knowledge base, if shared and retained. The quest for further education could be attributed to the established norm at the universities, that promotion is mainly based on advanced and further studies. Therefore, it can be said that the higher one's level of education, the more knowledge acquired. Similarly, the more knowledge acquired or obtained the more likely to value and appreciate knowledge and KM.

Just as Yusof and Ismail (2009:2) indicated, the positions of employees have some impact on knowledge creation and sharing, such as senior staff who often serve as mentors and coaches to junior and less experienced staff. The majority of the respondents were faculty members (5.3.1.1) who mainly embark on knowledge creation and sharing through teaching, research and learning, with this, they can appreciate and effectively participate in the creation and sharing of knowledge.

## 6.3 Types of Knowledge

The first objective of the study was to identify the types of knowledge created, shared and used at the universities. Prior to this, the researcher sought to verify whether the staff of the universities were familiar with and understood the concept of knowledge and KM. The staff's level of appreciation and value of knowledge and KM was largely dependent on their familiarity and understanding of KM. This would then affect their understanding of the types of knowledge existing at the universities.

There is an indication was that the respondents had a high level of familiarity and understanding of the concept of KM, as evident in section 5.4.1. These findings were expected from the staff of universities, which are concerned with the creation and sharing of knowledge through teaching, research, learning and innovation. It was expected that they would understand the concept of knowledge and KM. This is consistent with the findings of Mohayidin et al. (2007:301), Nguyen et al. (2009) and Mikulecká and Mikulecký (2012:3).

With the high level of familiarity and understanding of knowledge and KM, it was important to establish which categories or types of knowledge are present and used at the universities. Nonaka and Takeuchi (2004) and Smith (2005:314) indicate that, for the success of every organisation, there must be both tacit and explicit knowledge, and the management of the organisation needs to recognise and value them in other to have a competitive advantage. This was the case of this study, as the result shows that more tacit and explicit knowledge are present at the universities than the individual categories of knowledge (see Table 5.3).

Managing knowledge in universities requires the ability to identify and recognise different types of knowledge. Aside from tacit and explicit knowledge, other types of knowledge identified

include: individual and personal knowledge, group knowledge, common knowledge, corporate knowledge, embedded knowledge, embodied knowledge, procedural knowledge, descriptive knowledge and declarative knowledge (5.3.2 and 5.4.1). These findings concurred with Section 2.3.2.1 that, aside from the tacit and explicit knowledge, there are other types of knowledge in organisations.

Furthermore, universities that want to harness and benefit from the knowledge they generate, share and use, need to pay critical attention to knowledge. Corresponding to the high level of familiarity and understanding of the knowledge and KM concept by the respondents, the general indication from the survey findings was that the universities paid substantial attention to KM practice, as evidenced in section 5.2.3. This indication is supported by Santamaria and Keslar (2002), Lepak (2009), Lord (2010) and Manuri and Yacoob (2011), who identified that it is necessary for organisations to focus their attention on KM practices and strategies, as well as channelling their knowledge in order to maximise their intellectual capital. These findings further supports the conclusion of Singh (2007:177), who expresses that organisations should be encouraged to increase investment and effort into ensuring that the information and knowledge available in databases, patents, trade secrets or tacit knowledge is fully utilised and transferred into products and services that give value to the organisation. To this end, KM at the selected universities appears to be well structured, developed and supported.

## 6.4 Knowledge Management Processes

According to Skyrme (2012) and Adhikari (2010:97), KM is the process that governs the acquisition, creation, organising, sharing and effective utilisation of knowledge to fulfil the objectives of an organisation. The assessment of the KM processes consists of knowledge creation, capturing, accessibility, sharing, storage and the usage of knowledge at the universities (UG, UPSA and GTUC). The general findings established a high level of KM processes at the universities (GTUC, 76.67%; UPSA, 69.26%; UG, 67.26%). The findings supported what Maponya (2004), Dalkir (2011: 65) and Mikulecká and Mikulecký (2009) found in their studies, which state that KM processes exist naturally in universities.

The negative responses found in the study can be attributed to the absence of strategy, limited systems to manage and safeguard knowledge, which also help the processes work in favour of the universities. As some respondents commented, lack of a KM system greatly undermines the creation, storage and retrieval of knowledge, this view is reflected in other responses obtained. Another major comment is that the focus of the universities is on recycling old knowledge, rather than generating new knowledge, thus, the lack of formalising the processes (see Section 5.2.4.7). In order to manage knowledge successfully, the associated processes need to be managed consciously and explicitly. In addition, to recognise the value of the intellectual capital at the universities should be recognised.

### 6.4.1 Knowledge Creation

According to Von Krogh et al. (2000), enabling knowledge creation expands the reasons and practical ways to support it, which allows consistent creation within an organisation. The current survey revealed that the majority of the staff at UG, UPSA and GTUC do create knowledge as shown in figure 5.5. This perception supports the findings of Ngulube and Lwoga (2007), Mikulecká and Mikulecký (2012), Siadat et al. (2012:846), Chigada (2014:184) and Anduvare (2014:130), which states that knowledge is often created by staff. The findings further strengthens the argument by Carayannis (2004), Lee (2014) and Anduvare (2014:130), that knowledge creation is one of the principal roles of universities.

This shows that the majority of the respondents participate in knowledge creation, especially at GTUC, thus it is safe to say that there is a proper system or approach of creating knowledge at the universities (Section 5.3.3.1). UG, UPSA and GTUC have existing knowledge creation systems. These are embedded in the day-to-day activities (teaching, research, learning, innovation, administration, etc.) of the universities, as was indicated through the comments in the survey. The process of knowledge creation starts when staff meet to exchange their personal and/or group knowledge, much of which is tacit. This includes insights, skills, ideas, know-howand so forth. The daily interaction among members of the universities serve as a perfect platform for knowledge creation, it is a self-evident function of universities and it is only after creation that knowledge can be stored and reproduced through education and training. The creation of new knowledge and effectively exploiting the existing knowledge, is an important process in KM.

The study further revealed that not all of the staff who are contribute to knowledge creation, are aware of their involvement, or for the use of KM for effective running and growth of the universities (Section 5.2.4.1). For instance, while 12.71% of the respondents said that they do not contribute to the creation of knowledge at the universities, 25.42% of respondents attested that they were not aware of the creation of knowledge process, indicating they are unsure whether knowledge is created at the universities. The participation of staff in the decision-making process is a sign of appropriate involvement, which include the relations among people who facilitate interactions. Interactions among members of universities enhance knowledge creation and innovation, therefore, it is essential that all staff have the opportunity to contribute ideas. The contribution of ideas presents the opportunity to capture tacit knowledge. UG, UPSA and GTUC play a major role in encouraging and supporting the staff to create or contribute knowledge to assist with the effective running of the universities.

The interviews brought up the relevance of knowledge creation at UG, UPSA and GTUC as academic institutions, all of them alluded that staff are involved in the knowledge creation processes, however, due to the conservative nature of some of the staff, they are not too aggressive in knowledge creation. This was evident by the responses by the interviewees, which stated that knowledge creation occurs when staff members meet their fellows and students during lecture periods, trainings, workshops, seminars, conferences and through publications (journals, hand-outs, textbooks, etc.).

It was mentioned that the universities have some structures and mechanisms in place to promote knowledge creation its staff. Many of the structures that are highlighted could be linked to the development and improvement of the libraries, research funds, motivations and the organisation of workshops and seminars. This supports the assertion by Siadat et al. (2012:865) that the availability of appropriate educational group techniques, systems and structures, such as libraries in universities can both empower trust, networks and knowledge creation. Universities need to offer research grants, rewards and promotions, training of staff and seminars to encourage knowledge creation among staff.

The study further revealed that not all of the staff are involved in contributing ideas for the running and growth of the universities (Section 5.3.3.1). As indicated by Quagraine (2010), staff participation in the decision-making process signifies the existence of interaction among the staff, which enhances knowledge creation and innovation over time. Unlike the scientific knowledge, which academics produce as an obligation, the contribution of ideas presents to an organisation the opportunity to capture tacit knowledge. The universities play a major role in encouraging and supporting their staff to create knowledge, in addition to the support that the academic staff needs to promote research, which is one of their core mandates, there must be a flow of ideas at the universities.

#### 6.4.1.1 Capturing Expert Knowledge

One of the first steps in designing a knowledge-capture initiative, is finding out which staff members possess knowledge that would be difficult to replace should they retire, move on, or be absent for a long period. This can be obtained through a variety of learning activities within an organisation, such as formal education, training programmes, group meetings, workshops, seminars, experimentation, conferences, mentorships, coaching, imitation, self-directed learning, among others. Knowledge can remain unused if not tapped, especially with expert (experienced) knowledge, which plays an integral role in KM, particularly in universities (Mikulecká & Mikulecký, 2000). Universities may rely on different systems and mechanisms to capture and record expert knowledge (Hedlund et al., 2002; Garcia-Perez, 2009). Among many considerations for an expert knowledge system, is the identification of experts or individuals with expert skills and expertise that justifies the need for such a system to be in place.

Frost (2015) asserts that, in capturing expert knowledge, it needs to be embodied in order to be disseminated to the universities as a whole. If expert knowledge can be recorded, it becomes part of the university's memory, safeguarding it as an intellectual asset and making it available for sharing across the wider university, with the potential benefit to innovation.

Knowledge can be captured while employees are working and when they are leaving employment. It became evident that the universities in this study have fairly solid measures to make sure that expert knowledge from staff, while serving in the universities, are captured for future use (section

5.3.3.2). This could be the knowledge on experiences, expertise, skills and so on. that they display during their day-to-day activities. Substantial expert knowledge is not captured and recorded, as was indicated by 22.88% of respondents in the survey, while 23.73% said they were unaware whether their knowledge was captured and recorded. In general, although the expert knowledge captured by the universities was high, GTUC (61.11%) was higher than UG (50.68%) and UPSA (55.56%). The reason for these positive findings could be attributed to the involvement of staff in decision-making, as expressed by some of the respondents, along with the existence of workshops and seminars as well as the continuing motivation schemes implemented for the staff to engage in research and publications.

The interviews also indicated that expert knowledge of staff was captured while they were in active service. It took the form of interviews, group and teamwork, collaborations, staff rotation, mentorship and coaching programmes, writing and publishing of books and journals, among others. The willingness and ability of a recipient to acquire and use knowledge are crucial elements in KM (Gupta & Govindarajan, 2000; Alavi & Leidner, 2001).

The study also established that capturing expert knowledge was not achieved without certain conditions being present, some of which the respondents raised. These hindrances include lack of an established, formal KM system and strategies to capture knowledge. According to Yen (2001:2), a knowledge system facilitates the capturing of knowledge and its absence will be costly for the organisation. Additionally, it was established that there were no resources and mechanisms in place, the motivation to tap the knowledge, incentives, rewards and recognition is limited, which inhibits knowledge acquisition and sharing. Despite the existence of incentives and reward schemes at the universities, some staff members were unaware of them and unable to benefit from them, hence, their feeling that their universities were unable to capture knowledge from their experts.

These challenges could pose threats and destabilise the successful implementation of KM systems in the universities if the management of the universities does not take immediate action. The SECI (socialisation, externalisation, combination and internalisation) theory views the interaction processes of tacit and explicit knowledge as an essential feature in KM. This was echoed by some

of the respondents that there was limited interaction among members of different departments of the same university. Ramirez (2007) argues that, if employees develop a fear of being viewed as less knowledgeable, they may be reluctant to receive knowledge from their peers.Some of the respondents also pointed this out, as they expressed their reluctance to collaborate and interact with other departments due to the fear of making mistakes.

Capturing expertise knowledge from staff, while they are leaving the universities, is important, there was a general indication that some systems are in place which, in some ways, capture expert knowledge (as evidenced in section 5.3.3.4). On the other hand, there was uncertainty from UPSA and UG, with only 48.15% and 49.32% of respondents respectively affirming that such systems are in place. The aim of knowledge capturing is to maintain the knowledge base of the universities. This knowledge is vital to the present performance of the universities and so it must be maintained. This was not the case at UPSA and UG, as they rarely captured knowledge of experts leaving the universities. This implies that vital knowledge is lost at this point, which calls for the implementation of systems to prevent the loss.

The introduction of incentives, research grants, rewards, attractive salaries and benefits at the universities can be used to harness expert knowledge, as suggested by some of the respondents, which is consistent with Jacob and Roodt (2007). It was further established that experts, such as professors, IT officers, librarians, research fellows and so on were moving from one university to the next in search of better positions, salaries, benefits or working conditions. In order to address the challenge of departing knowledge experts, the universities ought to have plans in place. Universities in Ghana re-engage retired knowledge experts for another year or more, this is more widespread with private universities such as GTUC, but this is not a permanent solution. According to Forbes (2013), to solve the problem of young people having to contribute to the pension fund of older people, many European countries are thinking of increasing the normal retirement age. This can serve as an example for Ghanaian institutions of higher learning.

#### 6.4.1.2 Capturing Informal Knowledge

Universities have enormous, untapped and valuable intellectual assets, such as the informal knowledge of their staff (Conklin, 2001:1), which resides in the collective human memory.

Universities are normally composed of a series of formal and informal systems, which means that they need to support both systems. Such as, the formal systems of teaching, research and learning through faster and smaller learning chunks, as well as the ever-increasing informal KM processes and learning. This has also been found in literature by authors such as Smith et al. (2001) to be one of the most valuable assets of an organisation Informal knowledge in universities can be captured through a variety of learning activities, for instance: training programmes, interviews, group meetings, workshops, seminars, experimentation, conferences, mentorships, coaching, imitation and self-directed learning. Informal knowledge rarely shows itself in its practical form, it usually manifests as fast moving and invisible wave energy, such as in conversations and meetings.

Looking at the levels of agreement and disagreement, the results of this study seem to indicate a general lack of awareness among the staff about the existence and capturing of informal knowledge, only a general minority (see section 5.3.3.4) seemed aware of the processes. There was also an indication that, even though the universities generally did not do well in capturing informal knowledge, GTUC was able to capture 50% of its informal knowledge as compared to UG (45.21%) and UPSA (44.44%).

#### 6.4.1.3 Institutional Repository

One aspect of KM is the implementation of a central repository or system to manage the local contents and memories of the organisation, rather than leaving it to chance (Frost, 2015). Critical and relevant knowledge, as well as memories of organisations must be stored in a location and in a format which can be easily accessed by users (Morrissey, 2005:6). The current study established that the universities have implemented repository systems, as indicated by 61.11% of respondents from GTUC, 59.26% from UPSA and 57.53% from UG. This translates to a 58.47% general agreement of the existence of repository systems at the universities. This finding concurs with the assertion by Ruggles (1998:84), Hockx-Yu (2006) and Frost (2015), who state that repositories are implemented in organisations to enable them to capture data, information and knowledge or its intellectual assets, in any form and to improve in all levels or departments.

Furthermore, repositories in universities provide services to faculties, researchers and administrators who want to archive research findings, reports, books, publications, creative

materials, among others, in any form. According to Uden (2014) and Abiola (2015:8), it has always been a practice, in almost all higher educational institutions, to store all relevant documents contributed by in-house resources in the knowledge repository or database. The implemented systems at the universities allowed staff to deposit the content and explicit knowledge as evidenced in section 5.3.3.4 and 5.4.2.4, storing knowledge in repositories is expected from the staff and allows them to utilise the knowledge generated within the community. Despite these findings, there is still a lot to be done with regard to storing of knowledge direct from, especially with UG.

#### 6.4.1.4 Accessing Knowledge

As established in sections 5.3.2 and 5.4.1, both tacit and explicit knowledge as well as other types of knowledge, exist at the universities. Accessing the explicit knowledge should be easy, since they are documented, however, tacit knowledge is more challenging to access. As Collier (2004) expressed, while repositories, and their affiliated search and access tools, are useful for finding nuggets of corporate wisdom that have been codified, there is a great deal of corporate knowledge that remains uncodified. As such, it is also extremely useful to be able to access knowledge directly the expert.

This study showed that knowledge was generally accessible, as evidenced by 50% of respondents from the universities. The results further indicated that there was easy access to knowledge at GTUC and UPSA, while UG findings indicated more difficulty, as evidenced in section 5.3.3.5 and 5.4.2.5. As such, systems and strategies should be implemented, to enable research and interactions among the staff of the universities. The socialisation component of the SECI theory, by Nonaka (1999) and Dubberly (2011), can play a major role, it could facilitate easier access to documented knowledge and tacit knowledge, for instance, through mentorship, coaching, e-learning, meetings and CoPs.

During socialisation, junior staff and new entrants in the universities access tacit knowledge from experts, mentors and retirees (5.4.2.4), this occurred at both at formal and informal levels. The juniors and new entrants can learn and, in the process, create tacit knowledge such as technical skills, which could be obtained through observation, imitation and practice. The universities also provide some facilities, such as computers and other supporting devices and systems, to facilitate

access to explicit knowledge, online or offline. The schools and departments collaborate with each other for easy access to knowledge; however, not all staff are aware of the possibility.

#### 6.4.1.5 Knowledge Sharing

As revealed by the literature and reflected in Chapter Two, knowledge sharing is part of the KM processes of an organisation. The operational objective of KM is to ensure that the right knowledge is available to the right person(s), at the right time, to aid them. According to Lee and Al-Hawamdeh (2002) and Ismail and Yusof (2009:1), effective knowledge sharing practices enable the re-use and regeneration of knowledge at an individual and organisational level. Organisations, worldwide, have been trying to undertake initiatives for introducing effective KM by embedding knowledge sharing in their work processes (Chaudhry, 2005). Omotayo (2015) articulates that creating and sharing of new knowledge is essential for the survival of almost all organisations.

Universities are supposed to share knowledge with their members and stakeholders, as it benefits the staff and the university as a whole. Kumaraswamy and Chitale (2011:309), establish that effective knowledge sharing enhances individual and group learning. This is not the case at the universities used in this study, as it was evident that knowledge sharing was ineffective, as seen by 44.92% of the general responses from the universities. However, it was more effective at GTUC, as evidenced by 61.11% of the respondents, while it was ineffective at UPSA and UG as evidenced by 44.44% and 41.41% of respondents respectively. A higher percentage from GTUC was expected, considering the earlier responses that indicated the relevance and appreciation of knowledge at the universities.

Chigada and Ngulube (2015) and Handzic (2015:53), indicate that collaboration, teamwork and socialisation are the surest ways to promote and enhance knowledge sharing in organisations, similarly, the SECI KM model of Nonaka (1999), can be used as well. This was not evident in the study, as some of the respondents commented that there is little networking among staff, therefore, individual and team competency should be developed through collaboration or CoPs. It was also expressed that academic workshops were rarely organised and sharing of knowledge was difficult for some staff because they fear that if they share knowledge, their positions may be threatened, which calls for the improvement in the awareness for sharing knowledge in universities (Soley,

2003) .Factors such as the recognition of key experts in the relevant fields of scholarship, group identity and self-esteem are all significant considerations in determining the passion to share their knowledge.

Not all knowledge in universities can be shared. The type of knowledge shared in universities largely depend on the estimated value of knowledge of each expert or staff member (Ford & Staples, 2006). Similarly, it depends on the availability and extent of intellectual property protection, the fears that another person might receive unfair recognition and accreditation for one's stolen intellectual property, is a key factor that discourages knowledge-sharing activities.

It was established in Chapter Two and Section 5.3.6.1 that technology is an important mediating factor in knowledge sharing and for successful KM. However, its functions as a platform, by itself, is insufficient to encourage knowledge sharing. Brazelton and Gorry (2003) and Kim and Jarvenpaa (2008), established that technology alone may not effectively facilitate knowledge sharing activities. Similarly, Cheng (2011:315) suggests that the role of technology for knowledge sharing can only be fully understood if it is related to the motivation thereof.

### 6.4.2 Knowledge Management Leadership

Leadership in universities plays a crucial role in building and reinforcing effective KM (see Section 5.3.4), as committed and effective leadership enhances organisational performance. Rylatt (2003) suggests that successful KM in an organisation is attributable to exemplary leadership who value and show high levels of commitment to innovation and continuous improvement. According to Hussock (2009:33), to establish and maintain the surrounding conditions for KM is a task for the management of an organisation. As Singh (2008:7) states, in every organisation, leaders set the example for others; therefore, it is assumed that leaders have direct impact on how the organisation should approach and deal with KM. The general findings of this study established a lack of leadership support and motivation to promote KM at the universities.

According to Choy (2005), the success of KM in organisations depends on its leaders establishing a clear KM vision. It is very important for organisations to have a clearly articulated and attainable vision that drives all KM activities. There is a lack of a vision for KM, as seen in the results of this

survey: only 33.05% of the respondents from the universities agreed that there is a clear KM vision and agenda, while the majority (66.95%) of the respondents disagreed or were neutral. The leadership has to ensure that they clearly outline the KM vision of the universities in order for KM to succeed. Besides the vision, there is need to have knowledge champions to provide leadership in various KM initiatives. The absence of a realistic, credible and attractive KM vision statement could hinder or minimise commitment of some staff to create and share knowledge. In addition, it will fail to establish a standard for excellence in managing knowledge and could create a knowledge gap between the past, present and future of the universities.

Leadership should put systems and structures in place for knowledge to be recognised and valued as a vital asset, even though, as seen in table 5.6, the leadership of the universities recognised and valued knowledge as an intellectual asset, but more still needs to be done. This supports the assertion by Yang et al. (2012:40) and Singh (2014:6) that the leaders of an organisation are able to direct the flow of information and knowledge and how KM processes are approached and dealt with. Leadership's appreciation and support is the most important factor of systematic KM, according to Hasanali (2002:4) and Choy (2005). From the results, leadership appreciated the pivotal role of knowledge at the universities, as evidenced by 66.67% of respondents from GTUC, 65.75% from UPSA and 62.96% from UG. Albers (2009) and Singh (2014) conclude that all the dimensions of KM are significantly related to how leaders value knowledge in organisations, are therefore, it is expected of them to infuse the right kind of leadership to enable better KM in an organisation, as experienced with the universities. Once leadership recognises, appreciates and values the significant role of knowledge in the universities, it will then be easy for them to support it, which will go a long way into enhancing KM. These findings support the studies done by Martin, Hatzakis, Lycett and Macredie (2005), Firestone (2005) and Martin and Marion (2005).

A major way for leadership to support KM, is by motivating the staff to create and share knowledge. As expressed by some of the respondents, support and motivation was evident through evaluating and promoting individuals or giving them more responsibilities, though it is not enough without capturing and storing the relevant knowledge. This was evidenced by 66.67% of respondents from GTUC, 63.01% from UG and 62.96% from UPSA. Omerzel et al. (2011:114) and Jafari et al. (2013:233) established that, when individuals in an organisation are given the right

support, they are able to create and share knowledge effectively. Despite the indication that leadership motivated staff to create and share knowledge, it was suggested that there was no clearly stated policy and directive on motivating the staff in terms of KM, which is an inhibitor for the successful implementation of KM (see section 5.3.4.8.13). Though some policies were said to be available at the universities, they were not functional and well adopted.

KM champions are responsible for spearheading KM processes in organisations. They provide guidance, insight and feedback on KM to the entire organisation. They plan, organise and coordinate a mix of knowledge, information, data and people or knowledge workers who own the expertise. The study revealed that there were KM champions at all the universities, as evidenced by 59.32% of respondents agreeing (66.67% from GTUC, 62.96% from UPSA and 56.16% from UG). This means there are adequate KM champions who will develop strategies, policies and practices that optimise the knowledge resource.

According to Singh (2008:6), the general belief in the 1980s and 1990s were that organisations need only one knowledge leader to make the process work successfully, is erroneous in the context of the present global world order. The findings from this study confirms this assertion, as the study revealed that at the basic level, all the lecturers at the universities are knowledge champions, seeing as they all take part in teaching, research, innovation and learning. The study further identified the following categories of individuals at the universities as the key KM champions: vice chancellors or presidents, pro-vice chancellors/vice president, provost, deans, librarians, quality assurance directors, ICT directors, research co-ordinators and heads of departments. For anyone to effectively supervise and champion KM activities in universities, the individual must occupy positions that enable him/her to do it, therefore, it can be said that every person can simultaneously be a novice and an expert in different fields of knowledge. Novices and experts need organisational leeway, which allows time for creating and sharing knowledge (Wilkensmann & Wilkensmann, 2011:96).

According to Adhikari (2012:98), KM calls for interaction and teamwork, not only among members drawn from different disciplines but also within management to enhance KM effectiveness. Teamwork led by leadership is relevant, hence, the need for its assessment. The

survey results in Table 4.14 suggest that this is yet to be achieved at UG, while GTUC and UPSA were able to achieve it. The qualitative result also showed that leadership often interact with staff of the universities, these interactions seem to take the form of both formal and informal meetings.

### 6.4.3 Knowledge Management Culture

Organisational culture is a fundamental factor in KM implementation. A culture that promotes the creation and sharing of knowledge is vital because it allows universities to create new knowledge from shared and existing knowledge. As with leadership, culture is a critical factor to the effective implementation of KM systems in universities. According to Ling (2011:331) and Matin and Kashani (2012:625), organisational culture is a set of values, rules, practices, rituals, opinions, norms and perceptions people have in common. Furthermore, Albers (2009) states that an ideal KM culture is characterised by trust, openness, teamwork, collaboration, risk-taking, common language, courage and learning.

Building trust is a critical component of creating and leading a learning organisation, as well as being an effective cultural change agent (Tschannen-Moran, 2013:45).The culture of trust should be encouraged, as it forms the basis for knowledge sharing and learning among employees. The study revealed the absence of trust at UPSA and UG, while GTUC showed a substantial level of trust as evidenced in Figure 5.16. According to Siadat et al. (2012: 865), if there is no trust among people in the exchange and sharing of knowledge, they cannot easily acquire and share knowledge. Trust between staff as well as trust within a university is equally important, as it would encourage staff to absorb each other's knowledge (Ling, et al., 2009:139). The presence of trust among staff also influences the process of knowledge sharing by increasing openness in knowledge exchange, which could facilitate joint problem-solving (Wang & Noe, 2009:118; Zhang, 2014:2), as revealed in Section 5.2.6.1. In addition, trust will allow the sharing of knowledge at the universities to be less costly and increase the likelihood that knowledge acquired from fellow employees will be sufficiently understood and absorbed, consequently, permitting employees to place the knowledge in good use (Swap, Leonard & Abrams, 2003:70; Ling et al., 2009:139).

Collaboration between staff enhances KM and organisational learning, it assumes a basic level of organisational skills such as teamwork (APQC, 2014). Effective KM requires a supportive,

collaborative culture and the elimination of traditional rivalries. According to Hussock (2009:28), collaboration is the formal sharing of ideas, thoughts and opinions, centred on arriving to agreement. For effective collaboration, there must be willingness to collaborate with others, as it significantly influences knowledge sharing, communication and collaboration.

The study revealed that a minority (40.67%) of the respondents agreed that there was willingness to collaborate with others at the universities, which was expected, as the culture of trust seemed absent. The interviews, on the other hand, found that there was a greater level of willingness to collaborate Staff are only willing to collaborate with each other when they trust others (Ling, 2011:331). Krok (2013:107) asserts that unwillingness to collaborate and share knowledge could be attributed to factors such as workers' commitment to the knowledge exchange process, their personality, age, sex, education and position. It could also be attributed to the employees' internal conditions, interpersonal relations, management style and organisational culture and on the knowledge itself: its value, type and ways of conveying it.

The presence of trust and willingness will promote effective knowledge sharing. As Lloria (2008) states: a lack of trust of other people's knowledge is a weakness, if it exists in an organisation. There should be a culture where the staff of universities are encouraged to share and re-use knowledge. The implication of a lack of trust and willingness to collaborate is that any attempt that the universities make to encourage and implement KM systems will become difficult. If strategies to promote and safeguard knowledge are implemented and a KM vision is well articulated, it could promote trust and willingness between staff members.

Teamwork plays a vital role in ensuring the effective implementation of a KM system. Universities around the globe have discovered that working on projects or committees as a team, result in more creative and informed decisions and coordination of work without the need for close supervision. As such, teams are replacing individuals as the basic building blocks at universities, because, it allows the universities to apply diverse skills and experiences towards its processes and problem-solving.

There was indication from the responses that teamwork was limited among the staff of the universities, this can be attributed to the deficiency of trust, openness and collaboration. Choy (2005) suggests that employees in organisations must work together to build on the ideas and strengths of each other, this can be done by establishing trusting, meaningful and lasting relationships within the teams.

According to Neil (2013:2), openness is the gateway and conerstone to KM. A culture of openness promotes effective interaction and, consequently, an effective KM system. This is not the case at the participating universities, as the results suggest that there was a marginal level of leadership openness to staff with a rate of 45.78% of the respondents stated. This could be associated with some of the comments made by the respondents, which state that some of their leaders are reluctant and unwilling to release information, even when it is needed for official duties. However, there was an appreciable level of leadership openness to staff at GTUC. When people experience emotions, such as fear, uncertainty, threats, insecurity, anxiety and a lack of trust, it reduces the level of openness for KM; therefore, interventions are required to create a sufficient level of openness.

### 6.4.4 Knowledge Management Technology

In Chapter Two of this study it was established that technologies and systems are required to create, acquire, retain, share and apply the best knowledge in organisations. Technologies such as collaborative computing tools, internet, intranet, knowledge servers, groupware, knowledge portals, document and content management systems, knowledge harvesting tools and search engines, are critical enablers of KM (Gupta, 2004; Dewah, 2011; Davenport, 2013; Knoco, 2015).

The universities have an adequate infrastructure to support KM, as evidenced by the survey and interview responses (sections 5.3.6.1 and 5.4.4). These findings were expected from organisations, such as UG, UPSA and GTUC, whose major aim is to embark on knowledge creation, sharing and retention through teaching, research, learning and innovation. These results support the findings of Morrissey (2005:7) who asserts that information technology is a KM enabler, which has provided new tools to perform the activity of building knowledge capital in organisations. Morrissey (2005:7) and Adhikari (2010:101) support this by pointing out that social relations,

networking and interaction are the main elements for implementing KM practices in organisations. As indicated by the findings, the universities implemented some infrastructural amenities in their libraries, ICT laboratories, departments and internet connectivity among others. It was established that the technologies that facilitates KM at the universities include storage, search, retrieval, collaboration and communication tools.

The availability of an infrastructural system should facilitate collaboration and easy access to knowledge for every staff member of an organisation. The results of the study reveal that most of the staff (sections 5.3.8.2 and 5.4.4) are aware of the existence and availability of technologies at the universities. However, technology was shown to be more available at GTUC than UG and UPSA. It was observed that, despite the availability of technologies, they were not used sufficiently for collaboration and effective KM processes (5.3.7.12). The lack of awareness of ICT tools among some staff members could impede their motivation for creating and sharing knowledge, to facilitate more effective and faster interactions, all the staff of the universities should have access to the ICT infrastructure.

## 6.5 Systems/Facilities that Facilitate Knowledge Management

A chief objective of the study was to identify the systems or facilities that facilitate KM at the universities. As indicated by Morrissey (2005:14), KM technologies include storage, search, retrieval, collaboration and communication tools. The rapidly growing use of information technology (IT) in academia is changing the way in which knowledge is created, organised, stored, managed and disseminated. It has influenced teaching, research, learning and innovation as well as fostered a constructive, open, dynamic, interconnected, distributed, adaptive, user friendly, socially concerned and accessible wealth of knowledge within universities (Lytras, et al., 2005). With the choices of internet, e-mail, intranet, groupware, telecommunication, memoranda, weblogs, mobile technology, online/web-based learning system and CD/DVD/VCD, respondents were asked to indicate whether these tools were used to facilitate knowledge creation and sharing at the universities or not.

According to Natarajan (2008), the ability to create and share knowledge between units contributes significantly to the performance of the organisations. Internet and intranet are cited as one of the

pragmatic routes to promoting knowledge creation and sharing. Based on this understanding, this study sought to establish the viability of the available internet to support KM at UG, UPSA and GTUC. Both the survey and interview findings established the existence of internet and intranet to facilitate KM at the universities. The indication was that most of the staff (81.36%) used the internet for collaboration and KM, while 55.93% used the intranet for collaboration and KM at the universities. Not all of the staff members had adequate access to the internet and intranet, as expressed by some of the respondents, indicating that only the administrators of technology have consistent and uninterrupted access and use of the internet and intranet. In spite of this, these tools are still used to share knowledge, indicating a high level of faith in the mailing system.

Groupware fulfils a number of specific roles in relation to KM in organisations. It enables both communication and group memory (Whittaker, 1996:409), not only does it facilitate and provide a forum for organisational communication, it collects and stores this communication as well (Williams, 2003). Despite the indication of availability of technology at the universities (sections 5.3.8.2 and 5.4.4) and the significant role groupware plays in organisations, the majority of the staff (section 5.3.7.3) were unaware of the availability of its existence, which calls for more effort to be put in place to encourage the use of groupware at universities. In addition to knowledge generation and storage, Gutwin and Greenberg (2002:416) note a general KM role, which states that all groupware systems should support and provide users with information about their collaborators. This collaboration is an immediate, real-time need within a virtual environment and Gutwin and Greenberg (2002:416) have done a great deal of research on awareness in virtual work environments.

Weblogs are personal journals published on the internet or intranet. The researcher wanted to establish the viability of weblogs in support of knowledge sharing and ultimately KM. The results reveal that the majority of staff members (Section 5.3.7.4) do not use the weblogs for knowledge creation and sharing. This means that the universities need to promote the use of Weblogs, as it was revealed that most of the respondents lack understanding of weblogs. Similarly, video-conferencing allows individuals or groups in two or more locations to interact simultaneously via two-way video and audio transmissions with the use of electronic transmitters, such as computers and voice over internet protocol (VoIP). It has enabled the flow of information and knowledge to

become more fluid within and outside of organisations. This tool encourages the sharing of ideas in a free-flowing manner, as well as in the form of structured repositories. Structured, conversational interaction in universities can facilitate conversation and promote knowledge generation. This was not the case at UPSA and UG (section 5.3.7.6) while it was used comprehensively at GTUC (5.3.7.6), this poor result could be attributed to some of the staff being unaware of available technologies and systems to support KM.

As with the internet, email, arguably, has become one of the most intensively used tools for KM in universities. It is being used for a multitude of different processes, which have stretched from simple message transfer to storing documents and contact information, to filing bookmarks, literature references, contact information and to managing tasks and reminders. The indication from the responses in this study was that e-mails were used extensively to facilitate knowledge creation and sharing at the universities as evidenced in Section5.3.7.7.

The widespread availability of mobile devices offers enormous opportunities for KM in organisations. Mobile technology enables learning across multiple contexts, through social and content interactions (Bajpai, 2015:2). The technologies include handheld computers, MP3 players, notebooks, mobile phones and tablets. There was a positive indication of the use and application of mobile technology for KM, as evidenced by 77.78% of respondents from GTUC, 55.56% from UPSA and 50.68% from UG. This indication is good for the universities, as mobile technology could be used everywhere, at all times, for knowledge creation and sharing. The higher mobile use rate at the studied universities, especially at GTUC, can be attributed to the fact that most of mobile devices are affordable, easy to acquire and ensure wider engagement.

In addition, web-based learning systems allow instructors to create individualised web pages (Sadik, 2004). This was not the case at the universities in this study, as was shown when the researcher asked the respondents to indicate the level of its usage. The findings from this study established the limited existence and use of online/web-based learning systems to facilitate KM at the universities (Section 5.3.7.10). However, web-based learning systems allow instructors to create individualised web pages (Sadik, 2004), but these systems were only used to display course resources at the universities, as indicated by the respondents.

CD/DVD/VCD have also become an essential teaching and learning resource in universities. According to Perrett (2010:1), a typical course disk may include the syllabus, course outline, calendar, instructions, lecture notes and outlines, handouts, assignments, interactive content such as quizzes and surveys, software, statistical tables, example programme files, programme code, data files, video lectures and tutorials as well as pertinent website links. The study revealed that not all staff members make use of course disks to facilitate teaching and learning and for KM at the universities (Section 5.3.7.11). This indication can be attributed to lack of awareness along inadequate computers and other facilities, which could facilitate the use of the CD/DVD/VCD (Section 5.3.7.12).

## 6.6 Strategies for Safeguarding Knowledge

In Chapter Two of this study, KM strategy was identified as one of the critical success of KM. Du Plessis (2007) opines that an organisation's KM strategy is supposed to create an understanding of the organisation's KM resources. Additionally, they should articulate the value of knowledge creation and comprise a number of integrated projects or activities. An organisation's strategy of KM is not arbitrary, but depends of the way the organisation serves its clients, the economics of its business and the people it hires.

Many scholars such as Dubin (2005), Jain (2009 and Dewah (2011) point out various strategies to safeguard and manage knowledge in organisations. These include: e-learning, CoPs, coaching and mentoring and storytelling. Responses were sought from the participants on the strategies their universities use to manage and safeguard knowledge. This question was relevant as it enabled the researcher to address and find solutions to the fifth objective of the study: assess the strategies adopted by the universities to manage and safeguard knowledge at the universities.

### 6.6.1 E-learning

E-learning is a fundamental tool for universities to gain a competitive edge (Liu & Wang 2008). Many universities are embracing e-learning as a means to provide education and to enhance the skills of its staff (Straub, 2009) and the success of this depends on several factors, such as availability of technologies and systems. The findings of this study established an appreciable

amount of e-learning adoption and usage at the universities, as evidenced in Section 5.3.6.4. These results concur with Al-Adwan and Smedley's (2012:121) views, as it was indicated that there were substantial systems and facilities for e-learning at the universities (evidenced in section 5.3.6.5).

As indicated in the results, the respondents mentioned some available resources and facilities that support e-learning at the universities. These include: PowerPoint presentations, e-libraries Moodle, e-mail; blogs; wiki; CD/DVD/VDC, search site/engine, slide share, computer/laptop, e-database/journals, online registration systems, online syllabus, course management system, online sharing of materials among students, teleconferencing, internet and web courses, keeping track of grades on assignments and tests online, Turnitin, Web 2.0, WhatsApp, SMS and DropBox. Ntumy-Coleman (2011), Asabere and Mends-Brew (2012) and Owino (2013) reached the same conclusions in their studies. A study conducted by the University of Queensland (Australia) demonstrates that one of the most common and successful strategies in teaching large classes is the use of web-based course material (e.g. course website, online resources, discussion boards, etc.) and use of mixed media in lectures (e.g. PowerPoint, overhead, etc.).

Just like any system, e-learning systems must undergo periodic assessment and upgrading. Creating an e-learning system to facilitate KM is an integral part of every university. However, even the most well-planned and carefully implemented e-learning systems will fall short of expectations if it is not assessed periodically. Ntumy-Coleman (2011) and Marfo and Okine (2012) indicate that, for the effective functioning of systems that facilitate e-learning, they need to be evaluated and upgraded frequently. This is to enable universities to achieve the maximum benefit from its implementation. The indication is that the majority of the respondents were not aware of any assessment and upgrading of the e-learning systems at the universities (Section 5.3.8.1.3). On the other hand, the interview results showed that the e-learning systems were assessed and upgraded frequently. This shows that the leadership were aware of the periodic assessment of the e-learning system while the general staff were unaware, which implies a lack of coordination and collaboration among the leadership and general staff of the universities.

### 6.6.2 Communities of Practice

CoPs are formed by people who engage in a process of collective learning in a shared domain of human endeavour, such as: a tribe learning to survive, a band of artists seeking new forms of expression, a group of engineers working on similar problems, a clique of pupils defining their identity in the school, a network of surgeons exploring novel techniques or a gathering of first-time managers helping each other cope (Section 2.8.2). The researcher wanted to establish the extent and manner in which the three universities exploited their forums in sharing knowledge, hence the investigation into CoPs and their ability as people-based knowledge-sharing mechanisms.

The interview results indicated a high level of understanding of CoPs. These interview results was expected since the interviewees were mainly senior officers of the universities who were directly involved in KM and were the KM champion as well. The staff's level of understanding of the concept of CoPs would enable them to appreciate and respond to the practice of KM. However, the survey results indicated a low level of understanding of the concept of CoPs (section 5.3.8.2.1). Furthermore, there is an indication that only select staff members actually belong to CoPs, as evidenced by figure 5.3.6. The results also indicated the existence of both formal and informal forums for safeguarding knowledge at the universities. Some respondents mentioned some of the platforms that encourage the transfer of knowledge as: meetings, workshops, seminars, conferences, retreats, among others. Some believed that not much was being done to bring staff together for the purpose of knowledge transfer.

The survey results further show that there were informal forums and gatherings for promoting and safeguarding knowledge at the universities, as is shown in the fact that 94.44% of respondents from GTUC, 92.59% from UPSA and 86.30% from UG believed them to be present at the universities. These informal forums mainly took place during work sessions, in corridors, coffee and lunch breaks, as indicated by some of the respondents. These survey findings were affirmed by the interview findings, in which most interviewees indicated that some of the meetings were unofficial and informal (Section 5.3.8.2.2). However, they were used to convey relevant information and served as platforms where various operational matters were discussed. Given these findings, one can safely argue that the staff at UG, UPSA and GTUC share knowledge among

themselves at both formal and informal meetings. The findings support the assertion by DeLong (1997), Ngulube and Mngadi (2009) and Wenger (2014), that CoPs do not only fit comfortably with the notion of work within a formal organisational setting, but also within an informal one.

Technologies have become more available to expand opportunities for CoPs. Wenger (2010) emphasise that technology plays a significant role in CoPs by providing a platform for effective dialogue. The results of the study show that the tools and systems that support CoPs at the universities were lacking (as evidenced in Section 5.3.8.2.4). This is corroborated by the fact that the majority of the respondents from the universities do not understand the concept of CoPs (Section 5.3.8.2.1). Although information technology supports communities and shared practice, scholars have investigated technology's role in supporting the community (i.e., communication) rather than the practice itself.

CoPs offer new opportunities for KM and learning processes by allowing new forms of interaction within teams. The survey established that there was a limited existence of CoPs in support of KM at the universities. This is evidenced by 18.64% of the respondents being aware thereof. The lack of understanding of CoPs by the respondents could be the main contributing factor to these findings, although respondents mentioned existing informal forums where they share insights and information.

According to Wenger and Snyder (2000:140), people in CoPs share their skills, experiences, expertise and knowledge in free-flowing, creative ways that could develop new approaches to problem-solving. These new approaches can yield positive, tangible benefits in universities, such as: decreasing the learning curve of new staff, responding more rapidly to staff needs and enquiries, preventing reinvention of the wheel as well as spawning new ideas for innovations.

Finally, the leadership of the universities must understand the significant role and effect that adopting and implementing CoPs as a strategy to promote and safeguard knowledge can play. They need to specifically define, map and identify innovative solutions for their CoPs and their role at the universities to gain a competitive advantage.

### 6.6.3 Coaching and Mentoring

In Chapter Two it was indicated that coaching and mentorships are ways in which knowledge in universities can be managed and safeguarded. According to Kroon (1996:6), these are purposeful, open and mutual relationships, which result in learning and development with mutual respect, acceptance and trust. They can be implemented as a strategy to manage succession planning, manage talent and safeguard knowledge, additionally. They ensure that there are adequate experts to take over some tasks when more experienced staff retire or leave the universities. These programmes are also designed to minimise the call back of retired staff (knowledge experts) at an exorbitant salary to transfer the knowledge that should have been transferred while they were still staff members of the universities (Mavuso, 2007:19).

Coaching and mentoring have been recognised as key developmental resources in university settings. This was also the case at the universities in the current study, as the survey findings show that 88.89% of respondents from GTUC, 81.48% from UPSA and 75.34% from UG (Section 5.2.9.3) agreed with the statement. With the majority agreeing that coaching and mentorship served as a strategy for managing knowledge, thus, efforts need to be put in place to increase it. Mavuso (2007:19) and McDowald (2014) reached the same conclusions in their studies. Furthermore, the findings revealed that less experienced staff were assigned to more experienced staff for coaching and mentorship. These findings therefore show the commitment in ensuring that the operational knowledge at UG, UPSA and GTUC was transferred among staff. Studies showed that the same conclusions were reached at the University of Aberdeen (2006) and University of Reading (2007).

### 6.6.4 Storytelling

Storytelling ignites knowledge. It is regarded as one of the most effective strategies for managing and safeguarding knowledge in universities as it can be used to shape vision, pass on knowledge and wisdom, and shape identity and organisational culture. Storytelling that builds on real knowledge-sharing situations, enables individuals to gather some of the understanding of the storyteller, as well as recast the story into their own contextual work environment, such as adding their own understanding to the process. Organisations are finding that storytelling provides a powerful strategy for sharing and safeguarding knowledge (Frost, 2014). In storytelling, stories

are used to elicit rich accounts of experiences shared in a team, or to shed light on organisational issues and to trigger discussions leading to organisational learning.

The indications from the survey and interviews established that storytelling at the universities was limited, the results show 40.74% of respondents from UPSA, 38.89% from GTUC and 20.55% from UG stating that storytelling was used as means of knowledge sharing. These results suggest that more needs to be done with storytelling as a KM strategy, since storytelling represents a significant form of knowledge; the universities need to come to grips with the nature of storytelling and how storytelling is being used. KM in the universities can be improved by incorporating stories that are great examples of knowledge and the transfer of knowledge.

### 6.6.5 Other Strategies

According to Haggie and Kinston (2003:33), one fact that is agreed on in terms of KM, is that there are different situations for different KM strategies. Aside from e-learning, CoPs, storytelling and coaching and mentorship, the findings indicate that many other strategies were used to promote and safeguard knowledge at the universities. These strategies include: training, development, education, motivational aids, incentives, exit interviews, face-to-face interactions, knowledge cafes, telephone conversation, development, sharing of experiences, succession planning, rotation and mobility of staff, workshops, joint problem-solving, joint decision-making and video conferencing. According to Ramalingam (2006:9), these are strategies that relate to how organisations look at its knowledge and learning in a strategic manner.

All of these strategies are used to plan, monitor and assess knowledge at the universities. Haggie and Kingston (2003:10) conclude that several factors need to be considered when deciding on a particular strategy to adopt, as the choice of strategy depends on the nature of the universities. Other studies by DiGiacomo (2003), Al Ammary and Fung (2008), Schulz and Jobe (2001) and Ramohlale (2014) established that many other strategies are used to manage knowledge in organisations. However, they only focused on certain aspects of the identified strategies. For instance, Ramohlale (2014:156-157) identified and discussed mentorship, gap analysis and knowledge audit as the main strategies used to manage and safeguard knowledge in organisations.

## 6.7 Assessing the Impact of Knowledge Management Systems

The sixth objective of the study was to assess the impact of the KM systems on the universities. KM can provide significant advantages to universities if organisational processes, suitable structure, strategy and favourable working environments support it (Kok, 2003). According to Chu et al. (2011:141), the objective of KM is to improve the quality of the contributions that people make to their organisations, by helping them to make sense of the context within which the organisation exists, take responsibility, cooperate and share what they know and learn and to effectively challenge and negotiate with others. Organisations have the potential to learn and new knowledge may be effectively be incorporated into specific practices so that it is accessible when needed. The impact of KM systems on universities varies, which could be related to the widening arrays of programmes, improving decision-making, efficiency, problem-solving, productivity, among others (see Section 5.3.9).

Research findings by Felder and Brent (1999) and Felder, Brent and Prince (2011) outline that one of the major contributing factors for the improvement of the success of programmes is the quality of information and knowledge available. At the University of South Australia (2014), programme evaluation and improvement are achieved by aggregating the information and knowledge of students and lecturers, which comprises all the core and elective courses of each programme. The indication from the findings of the present study is that the majority of the respondents affirmed that KM enabled the universities to widen the array of programmes offered, as evidenced by 77.78% of respondents from GTUC, 62.96% from UPSA and 50.68% from UG.

According to Petrides and Nodine (2003), the entire objective of KM in education is to augment and ensure that students get the right knowledge through the quality of material or instructions. By increasing the competency and confidence of educators, KM directly improves the quality and quantity of the content, which raises students' learning results. Petrides and Nodine (2003) also indicate that KM is helpful to the development processes of academic institutions, because KM is able to enhance the quality of curriculums and programmes, efforts in faculty development and quality of administrative services.

KM is also supposed to improve decision-making, the surveys and interviews concurred that this was accurate at the universities as evidenced in section 4.3.9.2.According to Chu et al. (2011:142), schools, like most organisations, should learn and gain knowledge to improve decision-making and innovation, especially in the age of increased external and internal pressures for change and improvement.

Managing knowledge in universities can also leverage efficiency across all schools and departments through accessing the right information, making informed decisions and eliminating the duplication of efforts. The results of this study concurred that the universities achieved this and improved the quality of instruction delivery and processes (Section 5.3.9.3). Petrides and Nodine (2003) further indicate that formal and informal administrative procedures, curriculum development processes, information-sharing patterns, information silos, salary incentives, award schemes and many other work practices, affect information flow within every organisation. KM systems help to establish robust processes that enable staff of universities to obtain the information and knowledge they need when they need it, as well as to share it with others who may benefit from it. KM can also help to promote processes that lead to a more informed decision-making.

Bhusry and Ranjan (2011) state that KM can enhance the quality of teaching and learning in tertiary educational institutions. This is also the case at the universities targeted in this study, as reflected in the findings shown in Section 5.3.9.4. Based on these findings, it can be stated that there is the urgent need for the improvement of the quality of education at the universities using KM systems. The importance of KM at the universities lies in augmenting the teaching-learning process, improving productivity, enhancing communication among academia, researchers and professionals, enhancing student perception and understanding of subjects as well as providing a common platform for pooling individual knowledge towards a common knowledge base. As Kidwell et al. (2004) put it, KM is very useful for the research, teaching and processes because it helps to encourage the competitiveness and responsiveness for exciting research grants.

Furthermore, e-learning is gaining universal acceptance as a viable means of enabling large numbers of students to access education, it had a significant impact on universities as indicated by the majority of the respondents (see Section 5.3.9.5.). These finding concur with the findings of

Awidi (2008), who established that e-learning systems had a positive impact on Ghanaian universities. Kwame Nkrumah University of Science and Technology (KNUST) and Accra Institute of Technology (AIT) in Ghana, realised the enormous potential of e-learning in relation to the universities' ever increasing student population. They have chosen to adopt and implement e-learning systems to serve as a platform to transform them into a modern citadel of academic knowledge in all spheres of science, humanities, business and more. Similarly, universities in Ghana have made some progress in building network infrastructures and acquiring computers to augment teaching and learning.

According to Hildreth et al. (2000), CoPs are used by organisations to improve their performances. CoPsis effective in promoting knowledge creation and sharing because most of an organisations' competitive advantage is embedded in the intangible knowledge of its people. Through the exchange of experiences and knowledge, while collaborating and working on specific projects in CoPs, individual members' skills, talents and knowledge will be improved. This will enhance the organisations' effectiveness as they recognise which one among them is an expert in a specific area. The survey indicated that CoPs have very little impact on the universities (Section 5.3.9.6). This result was expected, since the understanding and practice of CoPs as a KM strategy was lacking at the universities, as established in Section 5.3.9.6. The interviews, however, indicated that CoPs benefited the universities, this was also expected as all of the interviewees are directly involved in KM and CoPs at the universities.

CoPs play a critical role in the promotion of teaching, research, learning, innovation, knowledge creation and sharing in universities, and they can be a powerful tool and strategy to generate sustainable competitive advantages (Swan et al., 2002). Knowledge resides in each community member and is accumulated over the years. This can be filtered, codified and processed to enhance teaching, research, learning, innovation, knowledge creation and sharing which add value to the universities. It was concluded that CoPs in higher education have many direct benefits for academic institutions.

## 6.8 Success Factors and Inhibitors of Knowledge Management Systems

The seventh objective of this study was to determine the critical success factors and inhibitors to the successful implementation of KM systems at the universities. Some of the critical success factors (CSFs) of KM were identified from the literature and others added during this study as discussed in Chapter Two. KM can provide significant advantages to the organisation if there are organisational processes, a suitable structure, strategy and favourable working environments (Wiig, 1999; Kok, 2003; Mostert & Synman, 2007). The concept of CSFs denote that, in each branch and in each area of an organisation's activities, a number of factors exist which determines its success (Klotz & Strauch 1990). CSFs identified in this study include: leadership, strategy, culture, information technology and people. It became vital to identify the CSFs as they have a great impact on the successful implementation of KM systems. The effort of assessing and developing KM systems may go to waste if implementation thereof is not done with the CSFs in mind.

### 6.8.1 Leadership

Leadership plays a key role in ensuring success in almost any initiative within an organisation. Many researchers such as Davenport et al. (1998), Ryan and Prybutok (2001), Mathi (2004), Salleh and Goh (2002), Kalling (2003), Chantarasombat (2007; 2009), Romahlale (2014) and Andevare (2014) have established that leadership's commitment in an organisation is the most critical factor for the successful implementation of KM systems. Rylatt (2003) also established that exemplary leadership that values and shows commitment to innovation and continuous improvement, ensure successful KM systems. Without the commitment and support from leadership of organisations, KM and other courses of action are difficult to follow or practice. They should be able to take responsibility for the failure or success of their organisations. This is in agreement with Chantarasombat (2009) who suggests that taking responsibility has to do with employee participation and developing a sense of ownership.

According to Holsapple and Joshi (2000:241), the distinguishing characteristics of leadership are: inspiring, mentoring, setting examples, engendering trust and respect, instilling a cohesive and creative culture, listening, learning, teaching and knowledge sharing. The leader creates conditions that allow participants to readily exercise and cultivate their knowledge manipulation skills, to

contribute their own individual knowledge resources to the organisation's pool of knowledge and to have easy access to relevant knowledge resources.

Leadership creates an environment that is conducive to facilitate knowledge creation and sharing. With the leadership's high level of understanding and appreciation of knowledge, they are able to create an enabling environment for KM demonstration and practice. As described by the respondents, leadership's success factors include: experience and appreciation of knowledge and KM; commitment to promote knowledge and KM; willingness to create and share their knowledge freely with other members of the universities; continuous learning and seeking new knowledge and ideas. Thus, for successful implementation of KM systems in universities, the visible leadership and commitment of leadership must be sustained. As expressed by Chong (2005), leadership creates the knowledge vision of the organisation, communicates that vision and builds a culture that regards knowledge as a vital, organisational resource. They also demonstrate qualities and skills such as ethical conduct, flexibility and management skills, which were regarded by the respondents in the current study as paramount to the success of the universities.

The survey, interviews and literature analysis show that the lack of commitment from leadership at important levels is one of the most critical barriers to the implementation of KM systems in universities. Without the necessary support from leadership to create the proper enabling environment and resources needed, implementing KM systems will be difficult. UG, UPSA and GTUC recognised the importance that leadership plays in implementing KM systems, however, the leadership support was found to be limited. The lack of support appeared to stem from combined lack of knowledge about KM systems and its role in universities, these findings were consistent with other research findings such as Bartczak (2002) and Chigada (2014).

The lack of dedicated KM champions also led to difficulties in effectively implementing and driving KM efforts at the universities. KM efforts were recognised as tough tasks at the universities because there were no established paths (KM vision and agenda) to follow. Due to this, most of the respondents who were spearheading KM efforts, were doing so without direction and were having difficulties in promoting KM to the leadership and staff. It was also realised that aside from the immediate leaders or champions, such as librarians and IT managers, the other levels of staff

were unaware of any KM strategy or agenda, and had no idea of which direction the universities were heading in relation to KM processes and practice. This provided a major barrier in coordinating efforts towards a common goal of KM, especially with IT units/departments, libraries, academic units/departments and registry. It was shown that the IT officers reported directly to the heads of the units/department, while the ICT director was also managing the ICT directorate. The coordination problems included difficulties in bringing together KM initiatives, approval for systems, which belong to other units, implementation of nonstandard hardware/software/technical infrastructure and overcoming a technological view of KM. These challenges exist because of a lack of coordination.

Related to the coordination role, is the absence of executive committees to steer and negotiate the implementation of KM systems. The lack of such committees makes coordinating the issues that cross the established organisation's boundaries extremely difficult, if not impossible. The necessity for such governing bodies is driven primarily by the intra-organisational nature of most KM efforts. Although the leadership of the universities recognised the need for oversight committees, they failed to put any formal mechanisms in place.

Another identified factor was the limited reinforcement of behaviours to promote KM. This study established that the inadequacy of rewards, motivation and incentives, was a major hindrance to knowledge creation and sharing. Although UG, UPSA and GTUC made efforts to put reward mechanisms and incentives in place, they were found to be limited and difficult to access. This was consistent with the findings of Chua (2003), Holbeche (2005), Jacobs and Roodt (2007) and Zawawi et al. (2011:63). They established that lack of incentives, reward systems and recognition support for knowledge creation and sharing, inhibited the KM processes in organisations. Hansen et al. (2001), Holbeche (2005) and Stafford and Mearns (2009) argue that people need real incentives and motivation to participate in the KM process. The staff would be willing to create and share information and knowledge if there was a financial motivation, support, benefit or value to knowledge creation and sharing. In the absence of this, it would be difficult to convince staff of any university to create and share knowledge.

### 6.8.2 Culture

Culture plays a vital role in all universities. Building and embedding a culture that promotes the creation of new knowledge is vital, because this allows universities to create new knowledge from shared and existing knowledge. There is general agreement that a knowledge-friendly culture must be present or nurtured in order for the successful implementation of KM systems in an organisation (Chong, 2005; Wong, 2005; Anduvare, 2014). According to Chong (2005), culture practices reflect how organisations view and facilitate both learning and innovation, including how it encourages employees to build the organisational knowledge base in ways that enhance values for the customers.

Even though culture is a critical success factor for the successful implementation of KM systems in organisations, it was recorded as the lowest success factor, as evidenced in Section 5.3.10.2. Forbes (1997) and Koudsi (2000) state that the biggest challenge in KM, is not a technical one, but a cultural one. An international survey of the approaches adapted to KM in 500 organisations, in Washington, USA, revealed that 80% of respondents cited existing, organisational culture as a major barrier to the successful implementation of knowledge-based systems. A similar study by Chong (2005) established culture as a major barrier to effective knowledge transfer and that employees' behaviour would have to change. Buckman (1999) posits that creating and sharing knowledge are intangible activities that cannot be forced. A culture of confidence and trust is required to encourage the application and development of knowledge within an organisation.

The factors highlighted by respondents in the current study, such as fear to make mistakes, mistrust amongst employees and lack of collaboration, greatly affected the successful implementation of KM systems. This is consistent with the suggestions made by Zawawi et al. (2011:63) and Chigada (2014). If staff experience fear of being viewed as less knowledgeable, they may be reluctant to create, share or receive knowledge from their peers, which was also pointed out during the interviews. Some of the respondents express fear as a major factor, this includes the fear to make mistakes in front of others and the fear of being dismissed or sabotaged by superiors, should they disclose certain information. As a result, the staff fail to contribute during meetings or team building sessions.

### 6.8.3 Information Technology

Chong (2006), Jain (2009), Chong and Choi (2005) and Sedighi and Zand (2012:4) posit that KM effectiveness could be achieved by utilising and deploying the latest technology, in order to capture, create, store and share. Both the survey and interview responses established IT as the foremost pillar (CSF) of KM system implementation at the universities, as evidenced in Sections 5.3.10.3and 5.4.8. In universities, just like any other organisation, the availability of IT can facilitate easy access to qualitative knowledge, retain and store the knowledge and facilitate effective sharing of the knowledge.

In a survey done by Covin and Stivers (1997) at 300 Canadian financial organisations and 500 US Fortune organisations, it was established that IT is the principal critical success factor for KM. A similar survey by Chong (2005) revealed that KM was strategic to the success of organisations and the most popular IT tools for managing knowledge are: relational databases, text and documents, search engines, groupware, data warehouses and data sharing. Bontis et al. (2000) also mentioned the technological tools to include the databases, organisational charts and process manuals. These are the same tools that respondents mentioned to be available that facilitate KM.

However, some of the respondents reported dissatisfaction with their existing infrastructure. This dissatisfaction primarily stemmed from the fact that existing infrastructure and applications were not easily accessible. Attempts to improve the applications at UG, UPSA and GTUC, were often hindered due to the lack of funding. These applications include library applications, applications for instructions and knowledge delivery by lecturers, content management software, among others. Respondents across the universities recognised that, until KM systems became available to everyday users, their support and use would continue to be lacklustre.

Even though there was an indication of a necessity for relevant software access and use, it was realised that the associated standards and policies were often unnecessarily restrictive and/or insufficient to cover the KM systems. The staff were forced (due to lack of funds or the desire for cooperation) to use pre-selected or open sourced KM software (price versus utility) instead of having custom-made and more relevant and appropriate versions of databases, search engines, and web development software. In some cases where the staff of UG, UPSA and GTUC found some

appropriate software for their purposes, they were constrained with funding and software compatibility at the universities. Such restrictions limited the ability to experiment with new technologies that could facilitate KM developments.

### 6.8.4 Strategy

One of the means for ensuring the successful implementation of KM in universities, is to have a clear and well-planned strategy, as established in Chapters Two and Five of this study. It includes defining clear objectives and goals, as well as trying to establish a relationship between KM and the business strategy of the universities. This provides the basis for how universities can organise its capabilities and resources in order to achieve its KM objectives and goals. In Chapter Two, several strategies for implementing KM have been suggested, a suitable one should adjusted to the situation and context of the universities. Zack (1999) and Sedighi and Zand (2012:5) suggest that, in order to attach more importance to a KM strategy, it should be able to support imperative business issues of an organisation. There seems to be common agreement in the literature that it has to be linked or integrated with the overall strategy of universities, from the survey responses, strategy recorded a significant contribution of 15.10% to the success of KM systems at the universities.

### 6.8.5 People (Human Resource)

People are the sole originators of knowledge, they are at the heart of knowledge creation, sharing and application in the universities, thus, their willingness to create and share knowledge is important (Sedighi & Zand, 2012). This factor consists of all the dedicated knowledge creators, experts, users, managers, librarians and so on. The results showed that 16.67% of the staff who took part in this study, attributed people as a success factor to the KM systems, this is supported by several research findings such as those of Wong (2005) and Sedighi and Zand (2012). They argue that human resources are the driving factor that determines the success of KM systems. The study revealed that, several strategies used by the universities to manage and sustain human resources, include: training, mentorship, workshops, seminars, coaching, sponsorships and so on.

In addition, universities must realise the significant role of teamwork to the successful implementation of KM systems. As such, one of the most important tasks in successful KM

systems is to form self-organising and cross-functional teams, who can seize and capture the right expert knowledge and present it in an easily accessible format. Even though it was limited, according to the university staff, the findings establish that staff involvement took the form of workshops, meetings and consultative forums, both at the formal and informal levels.

## 6.9 Chapter Summary

This chapter dealt with the analysis and interpretation of the results of the study. The discussion was organised based on the research questions, which are stated in Chapter One. During the discussion of the results, the researcher made continuous reference to Chapter Two (literature review) and Chapter Five (data presentation and analysis), it was established that the concept of KM was known and understood by the respondents of the universities. In addition to the tacit and explicit knowledge, other types of knowledge such as common, procedural, declaratory knowledge were identified as existing at the universities. Though there are KM processes (creation, capturing, retention, accessing and sharing) present at the universities, there is still room for improvement. KM practices such as leadership, culture, technologies and culture were also present at the universities. Additionally, e-learning along with CoPs, coaching and mentoring, storytelling were identified as a known strategy for managing and safeguarding knowledge at the universities, though they not fully utilised and need to be improved for proper KM.

It was also established that systems/facilities such as: internet, e-mail, intranet, groupware, telecommunication, memorandum, weblogs, mobile technology, online/web-based learning system and CD/DVD/VCD were all present and use to facilitate KM at the universities. However, some of these facilities were not known or adequately used by the staff. Furthermore, the findings show that KM systems had a positive impact on the universities. These include: widening the arrays of programmes, improving decision-making, efficiency, problem-solving and productivity. Additionally, it was revealed that the success of KM systems at the universities was attributable to critical factors such as leadership, IT, strategy and human resources (people).

Chapter Seven will present the summary, conclusions and recommendations of the study.

# CHAPTER SEVEN
# SUMMARY, CONCLUSION AND RECOMMENDATIONS

## 7.1 Introduction

The previous chapter presented the interpretation and discussion of the findings, in relation to the stated objectives, data collected and presented in Chapter Four, as well as the literature on knowledge management reviewed in Chapter Two. This chapter, Chapter Seven, restates the purpose of the study and provides a summary of the previous chapters as well as the findings of the study. It also presents the conclusions and recommendations based on the findings. The study sought to assess the implementation of KM systems in Ghanaian universities and the strategies that could be adopted to manage and safeguard knowledge for a competitive advantage and future use.

## 7.2 Summary

This section aims to prevent a summary of the study. It begins with a summary of the chapters of the study, it follows with encapsulation of the findings emanating from Chapters Four and Five.

### 7.2.1 Summary of Chapters

The first chapter of the study commenced by outlining the introduction and conceptual framework for the background of the study, in an attempt to assess the implementation of KM systems in Ghanaian universities. The conceptual framework of the study covered essential issues such as: the background of KM in organisations, specifically in universities; the statement of the problem; the purpose and objectives of the study; research questions; significance of the study; the scope and limitations of the study. The definitions of KM and explanation of key concepts were discussed including the originality, research methodology and organisation of the study.

Relevant literature was extensively reviewed in Chapter Two with the aim of addressing the research objectives. This covered an overview of published literature on the knowledge pyramid and the relationship between data, information, knowledge, evolution of KM, the KM concept and the various definitions of KM. It explained KM systems from an organisational, technological and non-technological perspective. The various strategies, tools, enablers and frameworks used to

manage and safeguard knowledge in organisations were also reviewed and, finally, the stages for implementing KM systems were outlined.

In Chapter Three, the background and profile of tertiary education in Ghana and the three selected universities for this study were discussed: University of Ghana, Legon; University of Professional Studies, Accra; and Ghana Technology University College, Ghana. The purpose of Chapter Three was to present a historical background of tertiary education in Ghana and of the selected universities, which include: academic programmes, mission and vision statements as well as staff and students' population. It also presents the partnership and collaborations that they have with other universities and institutions of higher learning.

Chapter Four outlined the research methodology used in carrying out the research in order to meet the objectives of the study, which was the mixed methods research approach. A questionnaire and interview schedule was developed to collect data from 12 respondents for the pilot study. Based on the findings of the pilot study, the research questionnaire and interview schedule were modified to improve the reliability and validity of the research. After the pilot study, the main study was conducted through a survey questionnaire and interviews, the survey had 118 respondents and nine face-to-face interviews.

Chapter Five analyses and presents the data that was collected via questionnaires and interviews. In reporting the questionnaire findings, the use of Microsoft Spreadsheet and SPSS 22.0 enabled the data analysis and presentation of the results in graphical and tabular forms. Whenever applicable, the actual words of interviewees were used to emphasise their own ideas. The main trends and patterns in the data were presented with reference to the research objectives and questions outlined in the Chapter One of the study.

Chapter Six dealt with the interpretation and discussions of results. The discussion was organised based on the research questions. During the discussion of the results, the researcher made continuous reference to Chapter Two and Chapter Five. A summary of the findings is presented in section 6.2.2.

The current chapter presents the summary, conclusions, implications and recommendations of the study. The study concluded that KM was largely understood by the respondents and practiced at the universities. Additionally, it was found that there were KM enablers and systems in place to facilitate KM practice at the universities, these enablers and systems had a positive impact on the University of Ghana (UG), University of Professional Studies, Accra (UPSA) and Ghana Technology University College (GTUC). The study made some recommendations on how to implement and improve KM, to compensate for the lack of effective collaborations, policies, strategies and facilities at the universities.

### 7.2.2 Summary of Findings

This section provides a summary of research findings based on the outlined research objectives.

#### 7.2.2.1 Types of Knowledge Created, Shared and Used

- KM awareness was high at the universities, however, it was found to be higher at GTUC than at UPSA and UG. The staff members of the universities understood and appreciated knowledge as a valuable, intangible asset.
- Tacit and explicit knowledge are the main types of knowledge created, shared and used. The results showed that the UG, UPSA and GTUC acknowledge and use both.
- The other types of knowledge that exist at the universities: individual/personal, common, group, corporate, embedded, embodied, procedural, descriptive and declarative.

#### 7.2.2.2 Knowledge Management Processes

UG, UPSA and GTUC are all academic institutions, thus, their core mission is knowledge generation and sharing through teaching, research, learning and innovation. KM processes (acquisition, creation, sharing and retention) are substantial at the universities.

##### 7.2.2.2.1 Knowledge Creation

- UG, UPSA and GTUC were able to create knowledge through research and the publication works of their staff (academic and administrative). However, it was found to be higher at GTUC than at UPSA and UG.

- Knowledge creation systems were available at the universities, which are embedded in their day-to-day activities.
- There are formal (structured) and informal (unstructured) mechanisms in place to promote knowledge creation, although some of the staff believe that it is not effective and expressed some reservations.
- Informal knowledge creation occurs during coffee breaks and informal dialogues among the staff, much of which is tacit knowledge.
- The universities, especially UG, have some challenges in creating new knowledge, this is because the mechanisms and strategies to facilitate knowledge creation were limited.

#### 7.2.2.2.2 Knowledge Capturing

- The universities have specialists and experts whose valuable knowledge is captured while executing their day-to-day activities through teaching, research, learning and innovation.
- The universities ensured that expert knowledge is captured from staff while they are working at the universities. This is knowledge acquired either before joining (gaining employment) or as they execute their day-to-day activities at the universities.
- Informal knowledge was established to be vital to the success of the universities, however, the universities were unable to capture the majority of the knowledge because of a lack of established mechanisms and strategies.

#### 7.2.2.2.3 Knowledge Retention

- There are adequate repositories in place to capture and retain knowledge at the universities, however, GTUC have more repositories than UPSA and UG respectively. These repositories provide services to the staff who want to archive research findings, reports, book, publications and creative materials.
- Expert knowledge was retained through the re-engagement and extension of contract for consultants and knowledge experts.

#### 7.2.2.2.4 Knowledge Sharing

- No stated nor documented policy, which regulates the sharing and accessing of knowledge, was present at the universities.
- Although the staff were able to share and access knowledge easily from the systems and experts, as evidenced in section 5.2.4.6, there were still selected staff who found it difficult because they fear their position may be threatened if they do so.

### 7.2.2.3 Knowledge Management Enablers, Success Factors and Inhibitors

Strong and effective leadership and organisational culture were available and accessible. Collaborative technologies and well-established, articulated strategies facilitated effective KM practices at the selected universities.

#### 7.2.2.3.1 Leadership

- The leadership of the universities valued and recognised the intellectual capacity of knowledge held by their staff (section 5.2.5.1); they did not overlook the importance of recognising knowledge as a strategic tool. There was a high level of understanding, appreciation, experience and commitment to promote KM. Additionally, willingness to create and share knowledge freely with other members of the universities, as well as continuous learning and seeking new knowledge and ideas, was present. Through this, the leadership was able to create a suitable environment for the implementation and practice of KM (sections 5.2.5.5; 5.2.5.6 and 5.2.5.7).
- The leadership were responsible for the creation and communication of the KM vision and agenda of the universities, as well as building a culture that regards knowledge as a vital organisational resource. The respondents established, however, that, either the leadership failed to communicate the vision, or there is no KM vision and agenda at the university (section 5.2.5.4.).
- Although the leadership have implemented some reward mechanisms to stimulate and motivate staff for knowledge generation and sharing, it was found to be inadequate (section 5.2.5.2).
- Evaluating the staff for knowledge creation and sharing, revealed a need for more awareness of creation and sharing (section 5.2.5.3).

- The leaders possess the relevant experience and skills needed to champion and spearhead the concept of KM at the universities.
- The results showed that librarians, IT officers, directors of research and innovation, quality assurance officers, vice chancellors, pro-vice chancellors, provosts, deans and heads of departments were the core people who champion knowledge.

#### 7.2.2.3.2 Culture

- The KM culture is reflected in the way the staff and the departments within the universities collaborate with each other (section 5.2.6.2).
- Building and embedding a culture that promotes the creation of knowledge is vital, because this allows universities to create new knowledge from shared and existing knowledge (section 5.2.6.1).
- There was a general agreement between the staff that a knowledge-friendly culture must be present or nurtured in order for the successful implementation of KM systems.
- The culture of willingness, openness and trust were somewhat present (section 6.4.3), however, it was established that the fear to make mistakes, mistrust amongst employees and the lack of collaboration, greatly affected the successful implementation of KM systems.
- There was the general view that culture has to be improved for KM to succeed.

#### 7.2.2.3.3 Information Technology

- Both the survey and interview responses established that IT is the foremost CSF for successful KM system implementation.
- Technologies, such as computers, software, learning applications and internet connectivity, were fairly (section 6.4.4) available and accessible, however, it was still insufficient for effective KM functionalities. A marginal portion of the staff believe the available technologies made it possible to collaborate with others, similarly, it has not brought them closer as a team nor enabled effective communication.
- Some of the respondents reported dissatisfaction with the existing infrastructure that supports KM processes at the universities, this stemmed from the inaccessibility of the infrastructure and applications.

#### 7.2.2.4 Knowledge Management Systems and Facilities

Systems and facilities, such as internet, intranet, e-mail, mobile technology and DVD/VCD/CD, were used to facilitate KM, however, policies on how the tools can be better accessed and used to enhance KM activities, was unknown. The universities need to put more systems in place that facilitate access and use of these tools. In spite of groupware, weblogs, boardrooms, teleconferencing and web-based learning systems being in place, they were rarely used.

#### 7.2.2.5 Strategies Adopted to Promote and Safeguard Knowledge

Strategies for managing and safeguarding knowledge are crucial for universities. This is because it provides direction on dealing with knowledge and getting desired results. This study show that the main strategies used to manage and safeguard knowledge at the universities, were e-learning, coaching and mentorship, CoPs and storytelling.

The adoption and usage of e-learning as a strategy for managing and safeguarding knowledge at the universities was inadequately used, especially at UG and UPSA. The universities mainly adopted and used open source systems and applications such as Dropbox, google drive, WhatsApp and so on to facilitate e-learning. It was revealed that the lack of skills, knowledge and an unwillingness to use and apply these facilities, especially at UG, impeded effective application. Although the e-learning systems were not frequently evaluated and upgraded, they had a positive impact on the universities.

The usage of CoPs as a strategy for managing and safeguarding knowledge at the universities was not encouraging, especially at UG and UPSA. It was established that, although the questionnaire responses showed a lack of understanding of CoPs, the interviews showed that the leaders really understand the concept thereof. Informal forums, which are used to create and share ideas, exist within the universities, however, there were limited facilities to facilitate CoPs, thus its impact was limited.

The use of coaching, mentorship and storytelling as a strategy to promote and safeguard knowledge were used inadequately. Other strategies that were identified include: training, development,

education, motivational aids, incentives, exit interviews, face-to-face interactions, knowledge cafes, telephone conversations, sharing of experiences, apprenticeship, succession planning, rotation and mobility of employees, workshops, joint problem-solving, joint decision-making and video conferencing.

#### 7.2.2.6 Impact of Knowledge Management Systems

It was established that the KM systems enabled the universities to widen the array of programmes, improve decision-making, leverage efficiency across the schools and departments and helped improve the quality of teaching, research, innovations and learning, thus improving the quality of the instruction delivery and process. The statistical differences, in terms of impact among the universities, were not significant, although GTUC had the highest rate, followed by UPSA and UG.

## 7.3 Conclusion

The conclusions of this study are based on the findings provided in Chapter Four. The purpose of the study was to assess the implementation of KM systems in Ghanaian universities as well the strategies that could be adopted to manage and safeguard knowledge as a competitive advantage and for future use. Powell (1997:11) expresses the view that "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. The conclusions for this study were drawn according to the order in which the research objectives were stated, though only the major findings that directly addressed the research objectives are discussed.

### 7.3.1 Types of Knowledge

Although the field of KM was a new concept at UG, UPSA and GTUC, the research has shown that the concept of knowledge and KM were understood and appreciated. Additionally, the respondents were able to outline the different types of knowledge that exist and are used at the universities. Addleson (2000:156) asserts that "action and decisions follow understanding", Taking this into consideration, it follows that UG, UPSA and GTUC have the capacity and potential to use knowledge and KM for a competitive advantage. It should be noted that an

understanding of knowledge and KM in itself is not satisfactory for instituting it, it takes research and a detailed assessment of institutional needs before venturing into a new field.

From the research findings, it can be concluded that, aside from tacit and explicit knowledge, there exist other types of knowledge in the universities (section 6.3). The researcher concluded that the user or knowledge worker/champion should identify and recognise the different types of knowledge in order to manage knowledge effectively

### 7.3.2 Knowledge Management Processes

UG, UPSA and GTUC are all academic institutions and their core mission is knowledge generation and sharing through teaching, research, learning and innovation. Despite the high presence of KM processes (acquisition, creation, sharing and retention) at these universities, the practice thereof was more effective at GTUC than that UPSA and UG respectively. These KM processes improved efficiency, effectiveness, helped to create innovative solutions and enhanced decision-making capabilities (section 6.7). However, the absence of trust, openness, willingness and effective collaboration among some of the staff and difficult access to technology resulted in deficiency in effective KM processes. This implied that, though the staff understood the concept of KM, they were unable to fully create, capture, store, access and share knowledge with others. The lack of support and mechanisms to promote informal discussions between staff and management of the universities negatively affected KM processes.

Despite the high rate of existence/awareness of KM processes and practice at the universities, the research concludes that the universities need to implement the culture of trust, openness, willingness and collaboration for it to be more effective. The universities need to consider making changes and putting in mechanisms that facilitate and support informal interactions among staff and management. This may include: setting a formal period for lunch, offering common spaces and arranging social gatherings and events outside of the university environment. Allowing the staff to connect to each other, build trust and decrease the fear of making mistakes, will encourage them to share knowledge and to arrive at common solutions.

### 7.3.3 Knowledge Management Enablers

Strong and effective leadership facilitated effective KM practices, organisational culture, available, accessible, collaborative-technologies and well-established and articulated strategies.

#### 7.3.3.1 Knowledge Management Leadership

Section 6.4.2 described the critical roles that leadership plays in building and reinforcing effective KM practices at the universities. They create a conducive environment to facilitate and stimulate effective KM for the staff. According to the results, the leadership at the universities involved in this study, valued and recognised the intellectual capacity of knowledge held by their members. In addition, KM champions played critical roles in ensuring effective KM practices. De Giovanni (2009) indicated that there is no knowledge without someone being able to champion it.

#### 7.3.3.2 Knowledge Management Culture

The important role of cultural factors in KM has been established by Liebowitz (1999) and Kalkan (2008:394-395) who stated that culture should constitute a principal component of a KM (section 6.4.3), because they are conducive to tacit knowledge acquisition. The KM culture in the studied universities is reflected in the way the staff and the departments within the universities collaborate with each other. The culture of willingness, openness and trust depended on factors such as what a person/group will gain from the collaboration.

#### 7.3.3.3 Knowledge Management Technology

According to Knoco (2014), technology has long been a KM enabler. The results of the study have shown that technologies such as computers, applications and internet connectivity were adequately available and accessible to support KM activities at the universities (section 6.8.3). However, a marginal proportion of the staff believed the available technology has provided a prospect for collaboration with others, bringing them closer as a team and enabling communication. To use technology as an enabler for KM systems implementation, as established by Frost (2015) and the research findings, requires the universities to acquire additional KM tools to support teaching, research, learning and innovation. These include intranet and improving on access to the available technology for effective collaborations.

### 7.3.4 Knowledge Management Systems and Facilities

The results of the study showed that systems and facilities such as internet, intranet, teleconferencing, groupware, weblogs, e-mail, mobile technology, online/web-based learning system, boardrooms and DVD/VCD/CD were used to facilitate KM at the universities. E-mail and internet were the main systems used, especially at GTUC, thus, the universities need to implement more systems and facilitate better access and use of these systems for effective KM.

### 7.3.5 Strategies Adopted to Promote and Safeguarding Knowledge

Strategies for managing and safeguarding knowledge are crucial for universities, which calls for proper preservation and retention. The findings from the study established that knowledge was regarded as a strategic asset by the staff. Having reviewed the literature dealing with KM and the findings of this study, the researcher concludes that the main strategies used to manage and safeguard knowledge at the universities are e-learning, CoPs, mentorship, coaching and storytelling.

E-learning was more popular than CoPs, coaching, mentorship and storytelling as the strategy for managing and safeguarding knowledge at the universities. E-learning was made possible through open source systems and applications such as: PowerPoint, e-library, Moodle, e-mail, blogs, wiki, CD/DVD/VDC, Web 2.0 and WhatsApp**.** Although the interviews showed that the leadership at the three universities understand the concept of CoPs, the survey responses showed otherwise. As established from the research findings in section 6.6.2, both formal and informal groupings at the universities need to be regularised. Other strategies such as storytelling, coaching, mentorship, training, development, education, motivational aids, incentives, exit interviews, face-to-face interactions, knowledge cafes, telephone conversation, development, sharing of experiences, succession planning, rotation and mobility of staff, workshops, joint problem-solving, joint decision-making and video conferencing, also helped in managing and safeguarding knowledge at the universities.

### 7.3.6 Impact of Knowledge Management Systems

The conclusion drawn from the research findings, is that the implementation of KM systems in the universities has enabled them to widen the array of programmes offered, improved decision-

making, leveraged efficiency across the departments and improved the quality of teaching, research and learning at the universities (section 5.3.9 and 6.7). However, there is a need for the improvement of systems to enable more effective KM practices, which will ultimately have a positive impact on universities. .

### 7.3.7 Framework for the Successful Implementation of Knowledge Management

Having analysed the various frameworks regarding KM systems, which were found in the literature and findings from research, the study concludes that, for the successful implementation of KM systems in universities, the focus should be on identifying and linking the KM enablers to the KM process, universities functions and knowledge, as established in section 6.9.

## 7.4 Implications of the Findings

This study has led to the uncovering the nature of implementing KM systems in Ghanaian universities. The researcher believes that the research may contribute to the theory and practice of KM. These findings may be used as the basis for the improvement of KM systems, this is reflected in the suggested integrated framework to guide KM systems implementation in universities.

The key contributions of this research arise from what has been established in the findings and what has previously been established in KM literature, in terms of the relationship between KM and organisational performance and how universities could benefit from KM systems implementation. Consistent with the theoretical basis presented in Chapter Two, it is imperative to prove that, if universities in Ghana adopt KM systems, they could become as effective and efficient as their counterparts in other countries.

### 7.4.1 Implications for Theory

After studying the relevant literature and theories for this study, the researcher realised that there have been previous studies on KM. However, it became clear that there is a general lack of literature reflecting the previous studies done on the implementation of KM systems in Ghanaian universities. There was also lack of studies that seeks to assess the impact of KM systems on the performance of a university. It is in this regard, that the researcher can conclude that this study constitutes a first contribution on the implementation of KM systems in Ghanaian universities. It

will also serve as a guide to the KM practice and implementation in organisations and, in particular, universities.

### 7.4.2 Implications for Policy Makers, Staff and Management

It has been established in this study that there are few KM systems currently used in the Ghanaian universities. Policy-makers and university regulators in Ghana, such as: the Ministry of Education, National Accreditation Board (NAB), National Council for Tertiary Education (NCTE), Council for Technical and Vocational Education and Training (COTVET), Vice-Chancellors Ghana and the Universities' Councils need to take practical steps to ensure the enhancement of the implementation of KM systems in Ghanaian universities.

KM is highly competitive and ever growing in the academic environment, therefore, the leadership and staff should improve KM awareness, adoption, application, build and implement appropriate systems and strategies to create a competitive advantage in the global arena. This can be done by inculcating KM into the university programmes, where staff will be given training on the adoption and application of KM in their day-to-day activities and the significant role that KM can play in universities as well as in the lives of the individual staff.

The critical success factors to the implementations of KM systems in Ghanaian universities are evidenced in section 6.8. It is, therefore, imperative for the staff and management of the universities to support and implement relevant systems and structures, which will continue to create an environment conducive to effective KM implementation.

Furthermore, the results of this study show that KM systems in the Ghanaian universities are in their infancy stage and some of the staff do not see the relevance of infusing it in the universities' programmes, as an efficient and modern way to create and share knowledge. This is because the facilities, strategies, applications and infrastructure are limited, similarly, the universities lack dedicated staff with the sole responsibility of championing knowledge.

### 7.4.3 Practical Implications

A number of practical implications were discovered in the research results, these include implications for KM systems and implications for KM enablers.

#### 7.4.3.1 Implications for Knowledge Management Systems

The research established an appreciable availability of KM systems, application and competitive benefit at all the universities, especially at GTUC. The study provides the first research in this area of study, in Ghana and possibly, Africa. The researcher traced the variables, which could account for the realisation of this positive outcome. It became clear that there were some systems and strategies in place, which manage and safeguard knowledge at the universities, though some staff members were unaware that this was KM related. This was demonstrated in section 6.3, according to their level of use and application of the available systems, tools and facilities to promote effective KM practice. The researcher established that the source of these KM benefits was the KM related practices which were considered, by most staff and leaders, as ways of ensuring that the core mission of the universities are attained. The researcher also realised that the issue of KM system implementation, at the initial stages, should be approached as a series of business improvement practices, without labelling them as KM. This is consistent with the findings of Berjerse (2000:175), Salojärvi et al. (2005:113) and Matzkin (2008:157).

Agreeing with other KM scholars, such as Syed-Ikhsanand (2004:243), that KM systems are beneficial to an organisation as a whole, the findings of this study confirm a positive impact on the universities (sections 5.2.10 and 6.7). The research findings imply that the role of KM related practices in laying the foundation of a sustainable KM implementation in universities, will enable them to know the potential benefits thereof.

#### 7.4.3.2 Implications for Knowledge Enablers

The research realised a relationship between the KM enablers (leadership, technology, culture and strategy) and the degree of achievement. This implied that KM enablers were a prerequisite for the implementation of KM in universities. As seen in the study, the relevant universities have KM enablers, even though some believe they were not effective, though the degree of impact varies. This supports the assertion by Davenport (1998), Bishop et al. (2008:22) and Omotayo (2015) that,

for a KM system to be successful, it should address the objectives and type of work performed in the organisation.

It is evident from the findings that it was not the absence of KM enablers that hindered effective KM implementation, but an inability to implement mechanisms, policies and strategies effectively. These findings suggest that the universities could enhance their KM implementation by putting more mechanisms, policies and strategies in place. From the findings of this study, it seems that the universities have enough capacity to initiate and implement KM systems, this capacity is rooted in their day-to-day activities.

## 7.5 Recommendations

Arising from the findings, conclusions and implications of the research findings, as highlighted, the researcher made some recommendations for the effective implementation of KM systems in Ghanaian universities, which address the research questions of the study.

### 7.5.1 Recommendation on the Types of Knowledge

Universities need to keep in mind that knowledge is a driving force to attain a competitive advantage. This study established that there were staff members who do not appreciate knowledge and KM at the universities, as evidenced in section 5.4.1. This has made it impossible for these staff members to decipher the types of knowledge present and used at the universities, therefore, it is recommended that the leadership or KM champions need to identify and recognise the different types of knowledge that exist. Additionally, it should form part of the core orientation programmes of the universities, that new recruits and all the staff must be oriented on the strategic role of knowledge and KM.

### 7.5.2 Knowledge Management Processes

In line with the findings in section 6.4, formal mechanisms and strategies to capture knowledge should be implemented and existing rewards and incentives and recognition of support for knowledge creation and sharing should be improved. The researcher further recommends that the universities implement exit interviews, which would enable them capture the tacit knowledge of experts before they exit the universities.

The study established that the universities had some systems that retain and store knowledge, though not all of the staff members were able to access the stored knowledge, collaborate or share their knowledge. In line with the suggestions by Singh (2007:177) and Singh and Soltani (2010), the researcher recommends that the universities increase their investment and put more effort into ensuring that information and knowledge available in the repositories could be easily accessed, fully utilised and transferred into products and services that give value to the universities. To manage knowledge at the universities, the researcher recommends that the leadership consciously and explicitly manage and coordinate all the processes associated with managing knowledge and recognise the value of their intellectual capital.

The research established a lack of policies regarding KM processes at the universities. In order to ensure consistency and coherence in the creation, capturing, retention, sharing and application of knowledge, the researcher recommends that there be a policy in place to guide the KM processes. According to the results, the universities failed to embed informal knowledge and KM practices into their processes. It is important that the universities recognise the role of informal knowledge and put in place systems and strategies to capture and incorporate it into the KM processes.

The study recommends that, for effective KM processes at the universities, the leadership should develop an integrated KM framework, such as the proposed framework discussed in the Chapter Six of this study. For the successful implementation of KM systems in universities, the focus should be on identifying and linking the KM enablers to the KM process, the universities' functions and existing knowledge (section 6.9). The researcher further recommends that universities adopt the SECI knowledge conversion theory (section 2.6.2). The SECI KM theory explains how knowledge is transformed from one state to another: socialisation (tacit knowledge created from tacit knowledge), externalisation (explicit knowledge created from tacit knowledge), combination (explicit knowledge created from explicit knowledge) and internalisation (tacit knowledge created from explicit knowledge). In this way, critical tacit knowledge can be captured, shared and retained in the universities, either by the social interaction of the staff, teaching, coaching, mentorship, storytelling, interview or publication.

### 7.5.3 Knowledge Management Enablers

It was established that, though a KM vision and agenda exists at the universities, they were not functional, this is evident in that the majority of the staff were unaware of its existence. In this regard, the researcher recommends that the leadership clearly articulate, document and make a KM vision available to all of the staff. Even though the leadership realise the significant role of knowledge, they need to invest significantly into managing knowledge at the universities, they should provide support through the provision of sufficient resources, structures and incentives that encourage staff to create and share of knowledge. In line with the suggestions of Chong and Choi (2005), the researcher recommends further training of the leadership on KM, its benefits and identifying of intellectual capacity of all cadres of employees.

Universities that recognise knowledge as a key resource for a competitive advantage, employ KM officers or champions to spearhead all KM initiatives and policies. This research discovered adhoc KM champions (section 6.4.2), which posed knowledge gaps to staff and leadership. It is necessary for the universities to identify relevant issues in terms of KM champions, that way, it will be possible to appoint dedicated and experienced champions to spearhead and drive all KM initiatives at the universities.

The researcher further recommends that the leadership of the universities review and incorporate a KM unit into their organisational structures, this will ensure that KM initiatives, policies and education programmes are implemented and made accessible. It will present opportunities to the staff to gain a better understanding of the strategic importance of knowledge in universities. As such, these professionals will be responsible to execute the following:

- Obtain the consensus of leadership in considering KM as a tool for competitive advantage.
- Develop and implement a KM vision and policy that governs KM processes.
- Monitor policies to ensure that all staff adhere to the KM vision and policies.
- Provide an infrastructure within and between the schools and departments of the universities for effective KM practice.
- Clearly define the tools, systems, strategies, framework and processes for managing and safeguarding knowledge.
- Coordinate all the KM practices at the universities.

- Build trust and confidence among the staff for effective collaboration and knowledge sharing.
- Provide incentives and support for KM processes.
- Identify the people responsible for inflows and outflows of KM.

### 7.5.4 Strategies to Promote and Safeguard Knowledge

It was discovered that the main strategies used to promote and safeguard knowledge at the universities were e-learning, CoPs, coaching, mentorship and storytelling, however, they were not used extensively. The researcher, therefore, recommends that the universities put in place policies to encourage the use of these strategies.

### 7.5.5 Knowledge Management Systems and Facilities

Based on the findings on technologies that facilitate KM, the researcher recommends that the universities invest in a comprehensive, technological infrastructure that supports KM. Additionally, they should create awareness on the technology, institutional repository and develop policies on ICT usage to manage and safeguard knowledge more effectively and efficiently. The universities should equip the departments, schools, libraries and computer laboratories with more and durable computers, improve internet connectivity, bandwidth and accessibility. The staff should be trained to appreciate, effectively operate and maximise the use of the systems. This will contribute to the depositing and accessing of items in the repositories.

As universities are moving towards distance learning-based education, a KM approach that uses Web 2.0 applications should be implemented. The use of Web 2.0 applications, such as Moodle and ATutor, is recommended, as it will help the universities to achieve their core missions. It was further established that knowledge was not easily shared or accessed by all staff, the study recommends the use of interactive and collaborative tools such as Facebook, Twitter, wikis, blogs and WhatsApp for knowledge sharing and access.

### 7.5.6 Knowledge Management Inhibitors

The study established that several factors inhibited knowledge acquisition, creation, sharing and retention at the universities, these include: mistrust amongst staff, lack of effective collaboration

and interaction, unwillingness and reluctance to share knowledge. Furthermore, the improvement of reward schemes and incentives would motivate the staff to create, share and acquire knowledge. The development and implementation of a knowledge sharing culture that cultivates trust amongst employees would be beneficial.

### 7.5.7 Impact of Knowledge Management Systems

The conclusion drawn from the research findings, is that the implementation of KM systems in the universities have enabled them to widen the array of programmes offered, improved decision-making, leveraged efficiency across the schools and departments, improving the quality of instruction delivery and improved the quality of teaching, research, learning and innovation. There is still need for the improvement in the quality of education using KM systems.

### 7.5.8 Framework for Implementation of Knowledge Management Systems

Arising from the findings highlighted in this chapter and Chapter Two, the researcher proposes a framework that could be used by academics and KM practitioners to implement KM systems in universities or organisations. The results from the study show that, for a successful implementation of KM systems, the focus should be on identifying and linking the KM enablers to KM processes, the university functions and knowledge. This forms the basis for the proposed framework to guide the successful implementation of KM systems in universities or organisations (see figure 7.1).

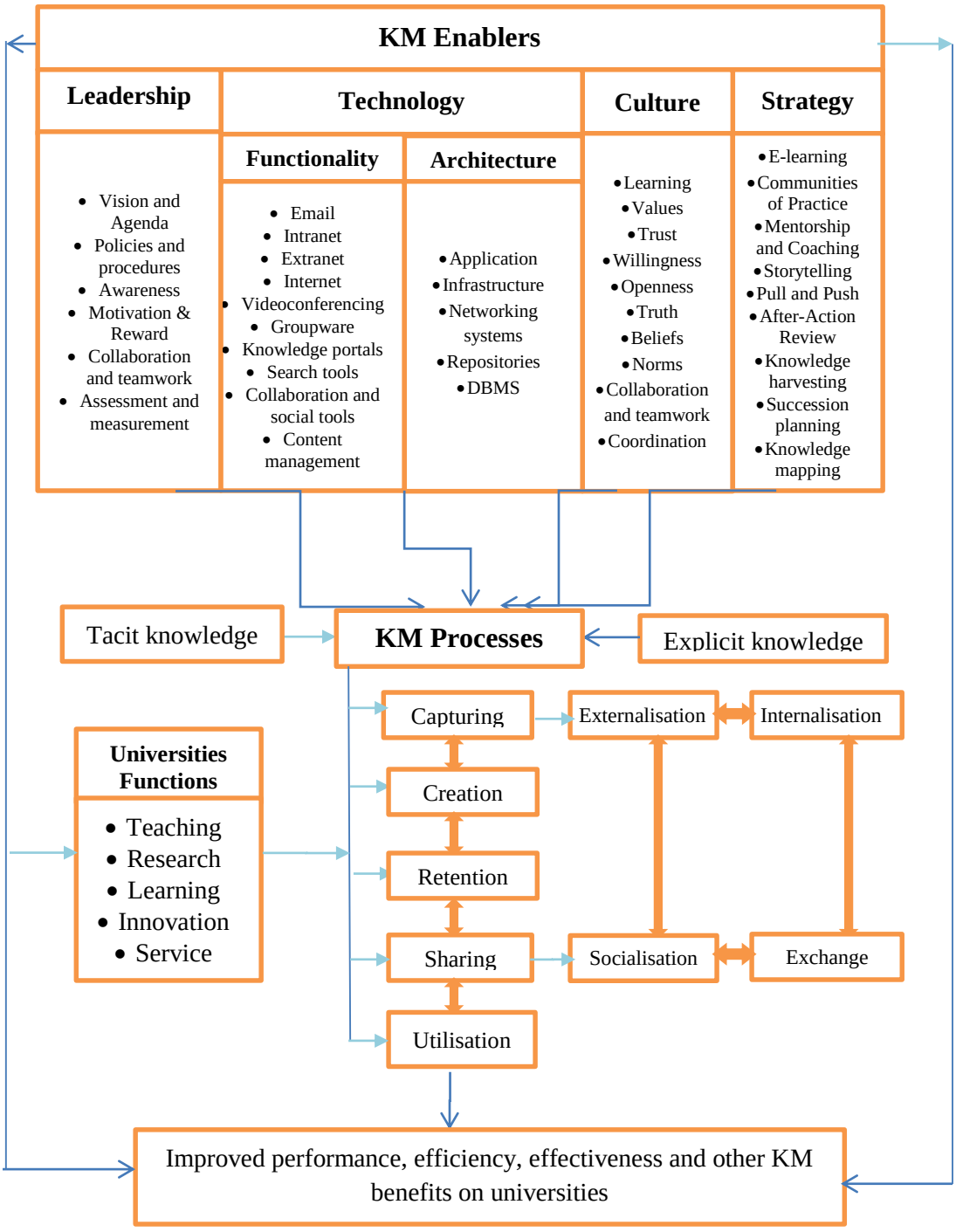


**Figure 7.1: Proposed integrated framework for implementing KM systems in universities**

#### 7.5.8.1 Knowledge Management Enablers

As observed from the above figure, the KM enablers consist of leadership, technologies, culture and strategies. Leadership consists of individuals or a group of individuals who take ownership and direct KM activities and core functions of organisations or universities. Their role in this framework is to develop and facilitate the achievement of the mission, vision, policies and procedures of the universities. Additionally, they implement appropriate actions and behaviours, are personally involved in ensuring that the university management systems are developed and implemented. Given this, they articulate the core value propositions to their staff, students and stakeholders. The leaders also establish collaboration, teamwork, motivation and reward schemes to stimulate staff to create and share knowledge easily.

In addition, technologies provide all the needed infrastructure, framework and support systems for effective KM practices in universities. Technology as a KM enabler plays two major roles in this framework: functionality and architecture. The functionality is based on layers: email, intranet, extranet, internet, videoconferencing, groupware and knowledge portals. The architecture is also based on five layers: application, infrastructure, repositories and database management systems. Specifically, the technologies aid the KM processes for a successful implementation of KM systems in organisations or universities.

Culture is identified in this framework as a KM enabler, its presence in universities facilitates effective KM practice and ultimately, the successful implementation of KM systems in universities. Culture in a framework that consists of learning, values, trust, willingness, openness, truth, beliefs and norms. Without these, all KM initiatives in universities will fail.

In this framework, KM strategies are the approaches and mechanisms employed by universities to bring into line and execute its knowledge resources, capabilities and agenda. They direct the generation, codification, retention, sharing, extraction and application of knowledge in universities. The strategies assist in getting the right knowledge from the right place, to the right person/system and at the right time. In this framework, e-learning, CoPs, mentorship, coaching, storytelling, pull and push, knowledge harvesting, knowledge mapping, after-action review and

succession planning were identified as the various strategies that could be used to facilitate KM in universities.

#### 7.5.8.2 Knowledge Management Processes

KM processes in this framework involve how universities design, manage and improve their activities, to generate increasing value for knowledge through the KM enablers. It is recommended that the KM processes consist of five main stages in order to utilise the knowledge. These activities should begin with acquiring, creating, retaining, sharing and application of both tacit and explicit knowledge. The KM processes should also involve externalisation, internalisation, socialisation and exchange through the knowledge capturing and sharing process. These processes are linked to each other for effective KM.

#### 7.5.8.3 University Core Functions

The core objectives of universities all over the world, are to embark on KM practices through teaching, research, learning, innovation and service delivery, such as consultancies (Mikulecká & Mikulecký, 1999). In the proposed KM framework, it is recommended that the KM processes are largely aided through the practices and achievement of the core functions of universities, which can only be achieved when they are linked to KM enablers.

#### 7.5.8.4 Knowledge Management Effectiveness and Firm Performance

KM systems are vehicles for improving universities performance, effectiveness, efficiencies, competitiveness and other benefits. Moreover, the successful implementation and application of KM systems enable universities to become innovative, improve decision-making, harmonise its efforts, enhance effective coordination and collaboration, provide relevant ideas for problem-solving and become more responsive to market change.

### 7.5.9 Recommendations for Future Study

Since this is the first of its kind in Ghana, the study suggests the following for further research:

- The study focused on academic and administrative staff, future research can sample some students, since they form a central part of the universities and play significant roles in KM.

- Given the importance of KM in universities, further studies should explore the broadening of the empirical perspective by investigating KM in other analogous (polytechnics, nursing colleges, colleges of education, etc.) or different organisations to clearly understand KM and its implementation in organisations in Ghana.
- There could be focused on the impact/role that KM systems have on the performance of universities across different regions, countries and continents. Cultural, political factors may differ on countries/continents.
- The area of use of incentive systems in encouraging KM requires further study into improving KM initiatives. The reason is that this includes: elements of motivation, theory and how it applies to a KM oriented organisation. It could also be useful in measuring staff skills and opportunities for the training and development of institutional practices such as: a knowledge-sharing attitude, collaboration, team spirit, rewards, recognition and staff relationships at all levels.

## 7.6 Overall Conclusions on the Research Problem

The aim of the study was to assess the impact of KM systems and the strategies that could be adopted to manage and safeguard knowledge in Ghanaian universities. The conclusions for this study were drawn according to the order in which the research objectives were stated in Chapter One. In drawing the conclusions, only the major findings that directly addressed the research objectives were discussed.

The research has shown that the staff of the universities understood the concept of knowledge and KM. The research concludes that in addition to tacit and explicit knowledge, there exist other types of knowledge: individual, personal, group, common, corporate, embedded, embodied, procedural, descriptive and declarative knowledge. Managing knowledge in universities requires the user or knowledge worker/champion to identify and recognise the different types of knowledge and the differences between them.

KM processes (acquisition, creation, sharing and retention) were substantial at the universities. Knowledge was created and acquired from both formal and informal systems. There were adequate

knowledge experts who collaborate and share their expert knowledge, although some of them are more reluctant and unwilling than others.

There was an absence of dedicated KM champions to direct and spearhead KM processes at the universities. Furthermore, it was established that there were limited schemes and incentives to motivate and stimulate knowledge creation or sharing. The findings revealed that the universities need to put mechanisms and strategies in place that promote and encourage the culture of trust, openness and willingness for collaborations and harnessing expert knowledge that is leaving the universities.

Systems and facilities such as intranet, e-mails, mobile technology and DVD/VCD/CD, were used to facilitate KM at the universities. Although groupware, weblogs, boardrooms, teleconferencing and web-based learning systems were available at the universities, they were rarely used. E-learning served as the main strategy used by GTUC for managing and safeguarding knowledge, though it was not as popular at UG and UPSA. The universities mainly adopted and used open source systems and applications such as: PowerPoint, e-library, Moodle, e-mail, blogs and Wiki. The limited internet connectivity, bandwidth and access to the technologies impeded effective use and application of e-learning at the universities. Similarly, there is a lack of skills, expertise and unwillingness to use and apply these facilities at the universities, especially UG. The e-learning system was more popular than CoPs, coaching and mentorship respectively, while the storytelling was the least used strategy for managing and safeguarding knowledge. Other strategies were identified in Section 6.6.5.

From the research findings, the conclusion drawn is that the implementation of KM systems in the universities have enabled them to widen the array of programmes offered, improve decision-making, leveraged efficiency across the schools and departments, improving the quality of instruction delivery and improved the quality of teaching, research, learning and innovation at the universities.

Having analysed the various frameworks that were found in literature, the study concludes that for a successful KM system implementation in universities, the focus should be on identifying and

linking the KM enablers to KM process, universities functions and knowledge, as recommended in section 7.5.8.

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**APPENDIX A**

**QUESTIONNAIRE**

P.O. Box ML293
Mallam Accra, Ghana
Tel: +233(0)243775571
Email: amenuvevedei@gmail.com

14th June, 2015

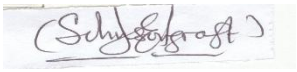
Dear Sir/Madam,

**PERMISSION TO COLLECT DATA**

I am a PhD candidate at the University of South Africa (UNISA) conducting research on the topic "Implementing Knowledge Management Systems in Ghanaian Universities". The purpose of the study is to assess the implementation of KM systems in Ghanaian universities and the strategies that could be adopted by the universities to manage and safeguard knowledge as a competitive advantage and future use.

Participation in the study is voluntary and any information provided by the participants will be treated with outmost confidentiality.

Thank you for your time and support.



De-Graft Johnson Dei

**INSTRUCTIONS**

1. Please indicate your response by ticking (X) in the appropriate boxes as provided.
2. Write in the provided spaces where appropriate. If the provided space is not enough, please make use of a separate piece of paper.

**SECTION A:**

**Demographic data**

1. Status
    a. Faculty/Lecturer [ ]
    b. Senior administrative staff [ ]
    c. Others……

2. Highest level of education
    a. Bachelor Degree [ ]
    b. Master's Degree [ ]
    c. Doctorate Degree [ ]
    d. Others …….

3. Gender
    a. Male [ ]
    b. Female [ ]

4. Age range
    a. 20 years and below [ ]
    b. 21-30 years [ ]
    c. 31-40 years [ ]
    d. 41-50 years [ ]
    e. 51 years and above [ ]

5. How many years have you been at this university
    a. Less than 1 year [ ]
    b. 1-3 years [ ]
    c. 4-6 years [ ]
    d. 7-9 years [ ]
    e. 10 years and above [ ]

6. Department/School ……

**SECTION B:**

**Categories of knowledge**

7. Are you familiar with or understand the concept of knowledge management?
    a. Yes [ ]
    b. No [ ]

8. What categories/types of knowledge are available at the university?
    a. Tacit knowledge [ ]
    b. Explicit knowledge [ ]
    c. Tacit and explicit knowledge [ ]
    d. Others ……

**Knowledge Management Assessment**

Knowledge management (KM) assessment involves an analysis and evaluation of the current organisational (university's) state of affairs with regard to KM. This assessment will focus on five (5) aspects, namely: Process, Leadership, Culture, Technology, and Measurement.

Please read the following statements and indicate with a tick (X) the extent of your agreement or disagreement

**9. Knowledge Management Process**

KM processes include the creation, capturing, storing, sharing, and effective use of knowledge in an organisation (university).

**Key:** 1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly Disagree

| | **Statement** | **1** | **2** | **3** | **4** | **5** |
|---|---|---|---|---|---|---|
| a. | Knowledge management as a practice is given attention or spoken about at the university | | | | | |
| b. | There is a practice of knowledge management at the university | | | | | |
| **c.** | I contribute to the creation of knowledge at the university | | | | | |
| d. | The university has a means of capturing **experts' (professional) knowledge while in the university** | | | | | |
| e. | There are systems in place that capture **expertise knowledge when exiting from the university** | | | | | |
| f. | There are means to capture **informal knowledge** (outside lectures/meetings) from staff of the university | | | | | |
| g. | The university has an institutional repository (knowledge storage system) in place to facilitate the capturing and storage of knowledge at the universities. | | | | | |
| h. | Knowledge created at the university is captured and stored in a repository or an easy to find location | | | | | |
| i. | There is easy access to knowledge created at the university | | | | | |
| j. | Sharing of knowledge across departments is easy | | | | | |

Any other comments on KM processes at the university, i.e. creation, capturing, storage, sharing, and application ……..…….. …….……
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**10. Knowledge Management Leadership**

KM leadership refers to the role that leaders and managers play in supporting KM process in the organisation (university).

**Key:** 1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly Disagree

| | **Statement** | **1** | **2** | **3** | **4** | **5** |
|---|---|---|---|---|---|---|
| a. | The power of intellectual capacity is recognised and valued | | | | | |
| b. | We are motivated to create and share knowledge | | | | | |
| c. | We are evaluated for knowledge generation and sharing | | | | | |
| d. | There is a clear articulated KM vision at the university | | | | | |
| e. | The university has enthusiastic knowledge champions (staff who push for knowledge creation and sharing) | | | | | |
| f. | Management promotes good teamwork with staff drawn from various disciplines | | | | | |
| g. | Management have a culture of openness and transparency with staff to stimulate innovation and learning | | | | | |

Any other comments on KM leadership……..……

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### 11. Knowledge Management Culture

KM culture refers to the norms/traditions of knowledge creation and sharing within an organisation (university).

**Key:** 1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly Disagree

| | **Statement** | **1** | **2** | **3** | **4** | **5** |
|---|---|---|---|---|---|---|
| a. | We generally trust each other to share knowledge with | | | | | |
| b. | There is a willingness to collaborate and share knowledge across departments/schools | | | | | |

Any other comments on KM culture …… …
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### 12. Knowledge Management Technology

KM technology refers to the technologies (tools/infrastructure) that an organisation uses to support KM processes

**Key:** 1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly Disagree

| | **Statement** | **1** | **2** | **3** | **4** | **5** |
|---|---|---|---|---|---|---|
| a. | The university has an IT infrastructure to support KM process | | | | | |
| b. | The IT infrastructure supports easy access to knowledge | | | | | |
| c. | The university has appropriate technologies such as intranets and portals through which I can upload and share content | | | | | |
| d. | I am able to collaborate with other persons outside the university | | | | | |
| e. | The technology makes teaching, research, and learning at the university easy | | | | | |

Any other comments on KM technologies ……..…… …
……..
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**10. Systems/Facilities that Facilitate KM**

Please indicate the extent to which the following tools/systems/facilities are used to facilitate effective communication and collaboration among staff of the university.

**Key** 1 = Agree (in use), 2 = Neutral (not ware), 3 = disagree (not in use)

| | **Statement** | **1** | **2** | **3** |
|---|---|---|---|---|
| a. | Email | | | |
| b. | Internet | | | |
| c. | Intranet | | | |
| d. | Groupware | | | |
| e. | Weblog | | | |
| f. | Boardroom | | | |
| g. | Teleconferencing | | | |
| h. | Memorandum | | | |
| i. | Mobile technology | | | |
| j. | Online/Web-based learning system | | | |
| k. | CD/DVD/VCD | | | |

Any other comments on KM systems and facilities ……..…… …
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## 11. Strategies for knowledge creation and sharing at the universities

KM strategy is simply a blueprint and mechanisms of how an organisation will manage its knowledge resources/assets better for the benefit of the organisation and its stakeholders.

### 11.1. E-learning

E-learning is the use of electronic media and ICT in education to facilitate knowledge creation and sharing (Diana, 2004).

**Key** 1 = Agreed (in use), 2 = Neutral (not ware), 3 = disagreed (not in use)

| | **Statement** | **1** | **2** | **3** |
|---|---|---|---|---|
| a. | E-learning is used for knowledge creation and sharing at the university | | | |
| b. | Accessing and sharing knowledge in the e-learning system is easy by lecturers | | | |
| c. | The e-learning system is periodically evaluated and updated | | | |

d. What tools are often used to effect e-learning at the university?

i. ……
ii. ……..
iii. ……
iv. ……..
v. ……..
vi. ……
vii. ……
viii. …….

### 11.2 Communities of Practice

A CoP is a group of people who have worked with each other for a period of time with a common sense of purpose and a real need to know what each other knows as they interact regularly (Mitchell 2003).

**Key** 1 = Agree (in use), 2 = Neutral (not ware), 3 = disagree (not in use)

| | **Statement** | **1** | **2** | **3** |
|---|---|---|---|---|
| a. | I understand the concept of CoP | | | |
| b. | I belong to a CoP | | | |
| c. | Informal forums to create and share ideas and insight exist at the university | | | |
| d. | CoPs supports knowledge management processes (creation, storing, sharing and application) at the university | | | |
| e. | There are tools and systems to facilitate CoP at the university | | | |

### 11.3 Coaching and mentorship

**Key** 1 = Agree (in use), 2 = Neutral (not ware), 3 = disagree (not in use)

| | **Statement** | **1** | **2** | **3** |
|---|---|---|---|---|
| a. | Coaching and mentorship is used as a strategy to safeguard knowledge at the university | | | |

### 11.4 Storytelling

**Key** 1 = Agree (in use), 2 = Neutral (not ware), 3 = disagree (not in use)

| | **Statement** | **1** | **2** | **3** |
|---|---|---|---|---|
| a. | Storytelling is used as a strategy to safeguard knowledge at the university | | | |

Any other comments on KM strategies …… …
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## 12. Knowledge Management Application and Measurement

KM Measurement refers to the steps an organisation (university) takes to check the effectiveness and impacts of KM on the organisation (university).

**Key:** 1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly Disagree

| | **Statement** | **1** | **2** | **3** | **4** | **5** |
|---|---|---|---|---|---|---|
| a. | The university uses KM to widen the array (line/range) of programmes/courses offered | | | | | |
| b. | The university uses knowledge to solve problems | | | | | |
| c. | The university uses knowledge to improve efficiency | | | | | |
| d. | The KM practice have a positive impact on teaching, research, innovation, and learning at the university | | | | | |
| e. | The e-learning system have a positive impact on teaching, research, innovation, and learning at the university | | | | | |
| f. | The CoP system have a positive impact on teaching, research, innovation, and learning at the university | | | | | |

13. **Critical Success Factors of KM systems**

Which of the following is/are the most contributing factor(s) to the effectiveness of KM process at the universities?

a. Leadership [ ]
b. Culture [ ]
c. Technology [ ]
d. Strategies [ ]
e. Others (please specify) …….

13.1 Why? (please explain) ……
……..…
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……
……..

14. What can be done to improve on KM process at the university?

    a. ……
    b. ……
    c. **.....**
    d. **.....**
    e. **.....**.....……

15. What are the main barriers to the effective implementation of knowledge management systems at the university?

    a. ……..
    b. ……...……
    c. ……
    d. …….
    e. …….
    f. …….

## APPENDIX B

## INTERVIEW GUIDE FOR SENIOR MEMBERS

P.O. Box ML293
Mallam Accra, Ghana
Tel: +233(0)243775571
Email: amenuvevedei@gmail.com

14th June 2015.

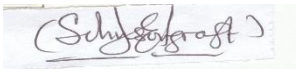
Dear Sir/Madam,

**PERMISSION TO COLLECT DATA**

I am a PhD candidate at the University of South Africa (UNISA) conducting research on the topic "Implementing Knowledge Management Systems in Ghanaian Universities". The purpose of the study is to assess the implementation of KM systems in Ghanaian universities and the strategies that could be adopted by the universities to manage and safeguard knowledge as a competitive advantage and future use.

Participation in the study is voluntary and any information provided by the participants will be treated with outmost confidentiality.

Thank you for your time and support.



De-Graft Johnson Dei

**SECTION A:**

**Demographic data**

1. Job designation/rank ……..
2. Gender ……..
3. Highest level of education …….

**SECTION B:**

**Knowledge Management Assessment**

This assessment will focus on five (5) aspects namely: Process, Leadership, Culture, Technology and Measurement.

4. **Knowledge Management Processes**
   a. What is your understanding of the concept of KM?
   b. What categories/types of knowledge are available at the university?
   c. Is KM as a practice given attention or spoken about at the university?
   d. How does the university generate knowledge?
   e. What are the sources of knowledge acquisition at the universities?
   f. What are the knowledge creation processes and systems available at the university?
   g. How is expert (professional) knowledge captured in the university?
   h. Are there mechanisms for absorbing individual knowledge into organisational knowledge?
   i. How is expert knowledge retained at the university?
   j. How is knowledge retained upon an employee exiting?
   k. Is knowledge easily accessible at the university?
   l. Is knowledge shared among staff and across departments/schools/faculties/colleges of the university?
   m. What do you think the university can do to enhance knowledge creation and sharing among its members?

5. **Knowledge Management Leadership**
   a. Does the leadership of the university recognises and values knowledge as a strategic asset?
   b. What policies and rewards/incentives are available to support KM at the university?

c. Does the university have enthusiastic knowledge champions (staff who push for knowledge creation and sharing)?
d. How does the university support and motivate knowledge creation?
e. Is there a reward system for creating and sharing knowledge?

6. **Knowledge Management Culture**

a. Do you think the university employees are willing to collaborate with each other?
b. Would you say there is ease interaction and knowledge sharing between the management and employees?
c. Is there a learning culture at the university (people learning on their own and helping one another learn)?
d. Do trust and openness permeate at the university?

7. **Knowledge Management Technology**

a. Do you think there is proper ICT infrastructure to support KM processes?
b. Is there a knowledge repository available at the university?
c. What tools/systems are often used to facilitate KM at the university?

8. **Strategies for KM**

**8.1. E-learning**

a. What does e-learning mean to you and the university?
b. Is e-learning used as a strategy for managing and safeguarding knowledge at the university?
c. What tools/systems are often used to effect e-learning at the university?
d. What factors encourage and promote the adoption and use of e-learning at the university?
e. What factors impede the adoption and use of e-learning at the university?
f. What are some of the benefit that can be derived from the use of e-learning as a strategy for managing and safeguarding knowledge at the university?

**8.2. Communities of Practice**

a. What is CoP
b. Do you belong to a CoP?

c. How is CoP practice at the university?
d. What tools are often used to facilitate CoP at the university?
e. What are the benefits of CoPs to the university?

**8.3. Coaching, mentorship, and storytelling**

a. Are coaching and mentorship used as a strategy to manage and safeguard knowledge at the university?
b. If yes, how?
c. Is storytelling used as a strategy to manage and safeguard knowledge at the university?
d. If yes, how?

9. **Knowledge Management Application/Measurement**

a. What are the factors that promote the successful implementation of KM system at the university?
b. What are the barriers to the effective implementation of KM systems at the university?

## APPENDIX C
## PERMISSION LETTER TO COLLECT DATA

P.O. Box ML293
Mallam Accra, Ghana
Tel: +233(0)243775571
Email: amenuvevedei@gmail.com

14th June, 2015

Dear Sir/Madam,

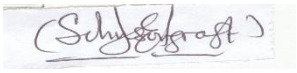
**PERMISSION TO COLLECT DATA**

I am a PhD candidate at the University of South Africa (UNISA) conducting research on the topic "Implementing Knowledge Management Systems in Ghanaian Universities". The purpose of the study is to assess the implementation of KM systems in Ghanaian universities and the strategies that could be adopted by the universities to manage and safeguard knowledge as a competitive advantage and future use.

Participation in the study is voluntary and any information provided by the participants will be treated with the outmost confidentiality.

Three institutions have been selected to participate in this study. These are University of Ghana, Legon (UG); University of Professional Study, Accra (UPSA); and Ghana Technology University College (GTUC).

Thank you for your time and support.



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