DEVELOPING A FRAMEWORK FOR THE MANAGEMENT OF INDIGENOUS KNOWLEDGE SYSTEMS IN PUBLIC UNIVERSITY LIBRARIES IN GHANA

BY

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ABSTRACT

The management of indigenous knowledge (IK) has not been part of the focus of academic libraries collections in Ghana. The need to manage such knowledge base of society has become vital in the era of information society where IK is deemed an intellectual strategic asset of society and an important element for sustainable development. The lack of representation of IK is partly blamed on its exclusion from academia. It behooves on information professionals to be at the forefront in the agenda to manage indigenous knowledge in collaboration with stakeholders.

The study sought to develop a framework for the management of indigenous knowledge in public university libraries in Ghana. The pragmatic paradigm using mixed method approach was adopted for the purpose of the study. The population for the study consisted of University Librarians, Senior members, and staff. Using interviews, questionnaires and observations, the researcher also reviewed documents on policies, reports, and procedural manuals which was relevant to the focus of the study.

The findings revealed that the mission of the universities had no implications on the management of IK. It was evident that in providing information resources as a mandate of the libraries, none of it focused on the management of IK because there were no targeted resources for its management and preservation. Furthermore, no part of the library's collection development policies spelt out the collection and management of IK because it was not integrated into the university's curriculum. It was also established that because the teaching delivery methods and curriculum did not support the use of IK, it made it difficult to pursue this agenda.

Recommendations included the establishment of centres of indigenous knowledge research at the universities as a starting point for the collection and documentation of indigenous knowledge. Information Professionals should come together to develop policies, standards on how to collect,

organise, store and disseminate IK. The need for stakeholder's partnership, policy guidelines and integration of IK into the library's collection with the aim of achieving transformation of knowledge systems, social inclusion of marginalised knowledge, equality, and sustainable development for an integrated IK management system was proposed.

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Finally, I am grateful to the University of South Africa and the Department of Information Science for allowing me to enroll with you to achieve this milestone.

DEDICATION

I dedicate this work to the academic and professional community of information professionals and my family.

DECLARATION

I declare that *Developing a framework for the management of indigenous knowledge systems in public university libraries in Ghana* is my own work and all the sources that have been used have been duly acknowledged in the citations and references.

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Signature   Date

Catherine Asamoah

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LIST OF ABBREVIATIONS/ACRONYMS

COP – Community of Practice

IFLA – International Federation of Library Associations and Institutions

IIRR – International Institute of Rural Reconstruction

IK – Indigenous Knowledge

IKS – Indigenous Knowledge Systems

INASP – International Network for Advancing Science and Policy

KMAT – Knowledge Management Assessment Tool

SECI – Socialisation Externalisation Combination Internalisation

CHAPTER ONE: INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 INTRODUCTION AND BACKGROUND TO THE STUDY

Academic libraries are mandated to collect, preserve, disseminate and manage all forms of information that support teaching, learning and research. As torch bearers of information resources that support research, teaching and learning, academic libraries must have in their collections, all forms of knowledge including indigenous knowledge (IK) (Ocholla 2009:21; Mavodza 2010:8). IK plays a key role in changing and improving the society for future generations. However, the collection development models for managing information in libraries are foreign centered (western models) and based on managing recorded and codified knowledge by scholars (Okorafor 2010:11; Ngulube 2002:95). Maina (2012:19) points out that there is absolute lack of representation of indigenous knowledge in academic libraries because the knowledge classification systems used by libraries lack concepts and subject terms that are particular to indigenous worldviews and epistemologies. Ngulube and Onyancha (2017) thus concludes that because of its multidisciplinary nature, there are no uniform approaches to label and conceptualize IK resources. Indigenous knowledge resources, nevertheless, if included in the library's collection forms a minute part of the collections of most university libraries in Ghana and are based largely on history and entertainment (festivals, songs, drama and stories). Thus, from preliminary observation from the library's collections, indigenous knowledge on education, agriculture, health, conflict management, environmental conservation, poverty alleviation, transmission of culture, natural disaster management, governance and other economic issues (management of resources) that contribute to sustainable development is mostly lacking in their collection.

The world is swiftly moving towards an information and knowledge society, where the knowledgebase of societies are a strategic resource to enhance development processes for sustainability. Development can no longer rely exclusively on western scientific knowledge (Ngulube 2012). The need for an all-inclusive content embracing local and indigenous ways of knowing and perspectives has become critical in the information society. Reiterating the need to value, manage and preserve IK, Ngulube (2017:92) explains that higher education has a clear

leadership responsibility in this regard by re-examining the inclusion of IK in the university curriculum. However, failure to integrate IK into education curricula continues to undermine its benefit to society (Chisita & Abdullahi 2010:4-5; Dei 2000:111-112) and consequently limits academic libraries role to manage and preserve them. This knowledge system has been extremely marginalised and underutilised in the development process in Africa (Makinde & Shorunke 2013:4; Ocholla 2007:239; Tella 2007:186). It has become necessary for libraries and information professionals to be proactive and more engaged in the management of IK to support research, provide access to valuable information on societies as a way of contributing to sustainable development and education. According to Raja, Ahmad and Sinha (2009:701-702) knowledge is the product of human experiences and therefore needs to be well managed (documented, accessed and preserved) for use before it is lost. Societies are defined by their culture; a nurturing process through which knowledge is transferred and shared from one generation to the other (Tharaka 2015; Moahi 2012; Masango 2010; United Nations 2006).

IK is local knowledge that is unique to a given culture or society (Kaniki & Mphahlele 2002:1-3; Ngulube, Dube and Mhlongo 2015), which people in the community have developed and continue to develop, based on experience (Boven & Morohashi 2002; Chisenga 2002:17). This is often tested over centuries of use and adapted to local culture and environment (Tharaka 2015:52; Masango 2010:74-75; Ngulube, Dube and Mhlongo 2015), dynamic and changing (World Bank 1998). According to Owusu-Ansah and Mji (2013:1-2), IK has guided the indigenous people in all aspects of their endeavour including "social, educational, agricultural, political (governance), economic, disaster management, spiritual and health" (Huysamen 2003:46). For development to occur, understanding ones' environment in the broadest terms is indispensable.

Libraries are in the foreground of research. Globally, they are seen as providers of information and its resources for teaching, learning, research among others. These distinctive responsibilities according to Makinde and Shorunke (2013:11-12) require libraries to "acquire information resources in various media, organise, preserve, create original information, repackage information and disseminate them to users through several user-oriented services". Documentation, storage,

preservation and dissemination of IK in host communities by libraries is seen as essential for sustainable development (Okorafor 2010:10; Moahi 2012:542). In trying to manage indigenous knowledge into explicit knowledge which can be shared and used, the information professional (IP) is confronted with the problem of access to indigenous knowledge and institutions, ownership, protection and copyrights, IK documentation, technology (storage and preservation media), communication and adaptation, partnership and coordination, institutional capacity and support among others (Ngulube 2002:96-99; Sithole 2007:120-122)

The extinction threat of IK (undocumented and inherent in the minds of its owners) calls for an urgent need to manage them before they become completely lost. The information professional's role in ensuring that these knowledge systems are well managed in terms of documentation, accessibility, usability and preservation cannot be underestimated. For this to succeed, there is the need for collaboration between information professionals and indigenous communities. According to Burtis (2012:6-7), information professionals should see themselves more as caretakers of Indigenous Knowledge rather than the owners of indigenous information in their custody. In Ghana, the management of IK has not been a core area of the collection development and information management of libraries. As emphasized by Ngulube (2002:95-96) memory institutions cannot claim to be custodians of the national cultural heritage devoid of embracing indigenous knowledge systems (IKS) and institutions. Hence, there is an urgent need for information professionals to be proactive and take it upon themselves to manage IK which plays a very fundamental role in developing societies for sustainability.

Ghana has profound IKS that are embedded in the culture of the people. However, because of inadequate documentation and organization, this knowledge rest in the minds of custodians who die with it (Kargbo 2005:200; Okorafor 2010:9; Moahi 2012:542). Consequently, this knowledge is gradually becoming extinct (Ngulube 2002:96; Lwoga, Ngulube & Stilwell 2010:174; Padmasiri 2017;475; Mhlongo 2018:4). Thus, making it an exigent need to manage it before it is completely lost. Information professionals have a pivotal role to play in the management process through documentation, providing accessibility, ensuring dissemination and publicity to both indigenous and non-indigenous people while protecting it against exploitation and encouraging the

acknowledgement of intellectual property rights (International Federation of Library Associations and Institutions 2012).

For the purposes of this study, information professionals (IP) (although a broader term, is used for librarians) interchangeably.

1.2 RESEARCH PROBLEM

Indigenous knowledge forms a significant aspect of people's lives in societies. The fear of globalisation, gradually undermining and marginalising African indigenous knowledge systems have led many African scholars and researchers across the continent to advocate for the inclusion of IKS into global knowledge systems (Moahi 2012:543; Owuor 2007:25; Kargbo 2005:204; Dei 2000:112). Much of the campaign has been focused on the inclusion of IKS into the university education system because IK is based on experiential, skills-based approach (Ngulube, Dube & Mhlongo 2015:161; Masoga & Kaya 2008:142) and ensures relevance to context (Yishak & Gumbo 2012:179). In contesting its inclusion into the university curriculum, Ngulube et al (2015: 146-147) points out that the library and information science programmes is ideal because the whole concept of it is managing, preserving and dissemination information and knowledge resources in different formats. The need to incorporate IK into the academy has been hindered by various factors such as lack of research on IK for academics to appreciate its value; limited stakeholder involvement in designing the curriculum; lack of teaching and learning material resources; dominance of western pedagogic practices; lack of initiation into IK philosophy and misconceptions about IK and its value (Ngulube et al 2015:151; Ngulube 2017:103-105).

For its integration into other knowledge systems and education, academic libraries must take the lead to collect, organise, document, disseminate and preserve indigenous knowledge as part of their collections for teaching, learning and research. Academic libraries are the repository for information and knowledge for research and learning. Thus, it is peremptory to keep and manage updated and authentic information (Kargbo 2005:206). The information professional's (IP) role in

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the information management processes cannot be ignored as has been identified in numerous studies across the continent (Plockey 2014:33; Okorafor 2010:11; Moahi 2012:549; Makinde & Shorunke 2013:10; IFLA 2012; Sen & Khashmelmous 2013:121; Mhlongo 2018).

In exercising the mandate of collecting, documenting, managing and preserving IKS, the information professional is confronted with the problem of access to indigenous knowledge and institutions and what aspect of IK to collect. Much of the problem emanate from the fact that the role of information professionals has not been clearly established in the management of IK. Whether IP should be documenters or managers of what has been collected and disseminate them continues to be a debate which needs to be clarified and forms part of the problem to be investigated. Issues of validation (integrity and authenticity) and who is assigned the responsibility for integrating IK into the library's collection development must be clarified.

Outlining the challenges that are encountered with the management of IK, Ngulube (2002:97) emphasized on the lack of collection development policies to guide information professionals on what aspect of IK to manage and the fact that the collection development policies in libraries across universities in Africa are modeled around managing recorded and documented knowledge written by scholars. A preliminary survey conducted by the researcher in five of the public universities showed that, in Ghana, the management of IK has not been directly fundamental in the collection development and information management of libraries because there are no organised structures, policies and institutions to bring this knowledge together.

Another challenge is the cost implications in managing IK which according to Ngulube (2002:97) overburden the limited budgets of libraries. The management of IK requires funding, institutional capacity and support to carry out the various activities. The cost of training staff to acquire the needed skills, the cost of equipment and cost of technology for storage and preservation media to provide accessibility and use remains a challenge. Added to the problems are ownership, protection and copyrights to protect the intellectual property rights of people who own this knowledge system (Maina 2012:18; Okorafor 2010:12; Sithole 2007:122; Kok 2005; Ngulube 2002:97) individually or at the community level is sometimes difficult to distinguish and has to be addressed.

Libraries, according to IFLA (2012) must publicize the value of IK to encourage its usage. This has not yet been envisioned in Ghana. Ngulube (2002:99) noted that applying marketing principles to the management and dissemination of IK can facilitate its utilization because users become aware of its existence. According to Makinde and Shorunke (2013) IP "need to appreciate the need to promote their products and services to ensure awareness amongst the communities they serve". In Ghana, promotion of IK has not been intensified. The contribution of IK to development in Ghana and some African countries has emanated predominantly from the agricultural and health sectors (World Bank 1998). Some non-governmental agencies such as the Center for Indigenous Knowledge and Organizational Development (CIKOD) in Ghana are doing well in empowering rural communities through their IK. Yet, the impact of information professionals to the management of IK in Ghana in terms of collection, documentation, repackaging, publicity, policy and partnership are not visible.

The management of IK is on the rise in the southern and eastern African countries (Ngulube et al 2015). This has been done sporadically, mostly through the documentation of oral traditions, video coverages and individual or institutional research purposes. Studies conducted by Plockey (2015) and Zablong and Plockey (2015) in Ghana also emphasized on the need to preserve IK through digitisation. However, critical issues hindering the effective management of IK were not addressed. Issues such as disconnectedness and isolation of IK from other sectors of the economy such as education, private sectors, government agencies are among the factors that continue to account for the marginalisation of IK. The challenge of IK not well integrated into the global knowledge system and disconnected from the educational and learning system also contribute to its underutilization. Due to its tact nature, recording, codifying and subsequently disseminating IK among communities and cultures according to United Nations (2006) becomes extremely difficult. It is for these reasons that the researcher finds it necessary to conduct a study of this nature to develop IKS in public university libraries for its effective management and use by identifying possible problems and making recommendations for their resolution.

1.3 PURPOSE OF THE STUDY

The study seeks to develop a framework for the management of IK in public university libraries in Ghana.

1.4 RESEARCH OBJECTIVES

The following objectives were formulated to achieve the purpose of the study:

1. To find out whether the mission of universities in Ghana incorporate effective management of IK towards sustainable development in Ghana.
2. To assess whether the management of IK is captured in the collection development activities of academic libraries in Ghana.
3. To identify the existing attempts at IK management in academic libraries in Ghana.
4. To identify the tools/expertise needed for the effective management of indigenous knowledge based on existing models.
5. To find out the challenges faced by information professionals in managing indigenous knowledge in academic libraries in Ghana.
6. To make recommendations based on the findings.

1.5 RESEARCH QUESTIONS

1. Do the missions of universities in Ghana incorporate the effective management of IK for sustainable development in Ghana?
2. How has the management of IK been captured into the collection development activities of academic libraries in Ghana?
3. What are the existing attempts at IK management in academic libraries in Ghana?
4. What are the tools/expertise needed for the effective management of indigenous knowledge?
5. What are the challenges faced by information professionals in managing indigenous knowledge in academic libraries in Ghana?

Table 1.1: Research Dashboard

OBJECTIVES	RESEARCH QUESTIONS	THEORIES/MODELS	METHODOLOGIES	DATA COLLECTION METHODS
To find out whether the missions of universities in Ghana include aspects on the effective management of IK towards sustainable development in Ghana	Do the missions of universities in Ghana have implications on the effective management of IK for sustainable development in Ghana?	Collection Development Policy	Mixed Methods Research	Questionnaire Interview Observation Document Analysis
To assess whether the management of IK is captured in the collection development activities of academic libraries in Ghana	How has as the management of IK been captured into the collection development activities of academic libraries in Ghana?	Collection Development Policy	Mixed Methods Research	Questionnaire Interview Observation Document Analysis
To identify the existing attempts at IK management in academic libraries in Ghana.	What are the existing attempts at IK management in academic libraries in Ghana?	The SECI Model Cognitive Justice Theory Information Integration Theory Knowledge Management for Development Earls Taxonomy Communities of Practice	Mixed Methods Research	Questionnaire Interview Observation Document Analysis

To identify the tools/expertise needed for the effective management of indigenous knowledge based on existing models.	What are the tools/expertise needed for the effective management of indigenous knowledge?	The SECI Model Cognitive Justice Theory Information Integration Theory Knowledge Management for Development Earls Taxonomy Communities of Practice	Mixed Methods Research	Questionnaire Interview Observation Document Analysis
To find out the challenges faced by information professionals in managing indigenous knowledge in academic libraries in Ghana.	What are the challenges faced by information professionals in managing indigenous knowledge in academic libraries in Ghana?	The SECI Model Cognitive Justice Theory Information Integration Theory Knowledge Management for Development Earls Taxonomy Communities of Practice	Mixed Methods Research	Questionnaire Interview Observation Document Analysis

1.6 JUSTIFICATION/SIGNIFICANCE OF THE STUDY

Calls for the integration of IK into education (Magara 2015:25; Tharakan 2015:56; Kok 2005:7; Mapesela 2004:318; Owuor 2007:27) justify the need for academic libraries to be involved in the management and preservation of IK. Ngulube (2002:99) emphasised on the need for IP to devise strategies for managing and making IK accessible to everyone through adopting marketing

strategies and effective promotion of IK to both indigenous and non-indigenous people. Information professionals have to be at the forefront of the promotion of IK, train and develop the skills to market IK as other forms of knowledge. By way of replicating this need, this study reiterates the need for the effective management of IK in Ghana for sustainable development and intended to stimulate the assimilation of IKS into the collection development of Academic libraries in Ghana by extending the services of libraries to cover all aspects of knowledge systems for the benefit of varied users and society.

Structures and policies are critical for the effective management of IK. The study aims to create awareness on the need to establish structures for the recognition and effective management and development of IKS for teaching, learning and research through policies to integrate IKS into the collections of Academic Libraries. The study provides the platform and means to disseminate and manage IK as a way of contributing to global information and project the rich knowledge of Ghana. The study emphasizes the need to preserve such knowledge systems for the benefit of society and future generations. Furthermore, the study gives the theoretical and practical implications in the management of IKS in academic institutions and how they can enhance the development of research and learning in Ghana. The dynamic, continuous and transferable nature of IK ensures life-long learning and empowerment for a socioeconomic change of communities for development (Magara 2015:38). Hence, the study tones the direction of academic libraries to pay attention to the management of IKS and add up to the broad spectrum of knowledge for learning, research purposes and also enrich the library's outreach and community extension programs. The need for national policies and structures is critical for the effective management of IK. In this direction, the study informs stakeholders in charge of library policies to focus their attention on the need for the effective management of IKS. The study contributes to the existing body of knowledge in managing and effectively harnessing IKS in Ghana.

1.7 DEFINITION AND DISCUSSION OF TERMS

1.7.1 Indigenous Knowledge and Indigenous Knowledge Systems

IK is local knowledge that is unique to a given culture or society which people in the community have developed and continues to develop, based on experience, often tested over centuries of use, adapted to local culture and environment, dynamic and changing (UNESCO 2017; Tharaka 2015; Masango 2010; Boven & Morohashi 2002; Chisenga 2002; Kaniki & Mphahlele 2002; World Bank 1998). IKS are knowledge systems that have developed within various societies independent of and prior to the advent of modern scientific knowledge (Tharaka 2015). Looking at its dynamic nature and historical value, Ocholla and Onyancha (2004:247) define IK as an archive of knowledge which is dynamic and imparted on people within a community as part of their nurturing and culture from one generation to the other. The dynamism and uniqueness of IK results from practical engagement in people's daily lives and armored by experimentation and experiences. **The labels used to describe indigenous knowledge, indigenous knowledge systems and indigenous knowledge management systems as explained by Onyancha et al (2018: 165) may be influenced by different factors. These factors as explained may include personal, historical, regional, disciplinary, sociolinguistic and publishers' preferences. The various definitions are based on the context in which one decides to situate it. In the context of this study** different terms are used interchangeably to describe IK. These are local or traditional knowledge, cultural knowledge, indigenous knowledge system among others which are technically the same in meaning (Padmasiri 2018:475; Ngulube & Onyancha 2017:215).

1.7.2 Academic Libraries

Academic libraries serve colleges and universities, their students, staff and faculty's learning, research and information needs (ACRL 2010). Their role of academic librarians is to coordinate with academic staff to ensure that students and researchers have the material they need or access to it (CILIP 2014). In addition, they teach information literacy skills and ensure that academic needs are supported as well as answering enquiries in a particular discipline.

1.7.3 Public Universities

Public Universities are universities that are funded by government from taxes collected from the public (National Accreditation Board 2017). They, therefore, serve the totality of the public by running diverse programmes that cut across different sectors of the economy at lower tuition rates.

1.7.4 Collection Development

Collection development is building library collections to serve study, teaching, research, recreational and other needs of library users (Fordham n.d).

1.7.5 Integration

Integration is bringing together different components or processes of a system or activity together to function as one (Rouse 2015).

1.8 ORIGINALITY OF THE STUDY

The significance of every research is the original contribution it makes to the field of study, existing knowledge, policies to affect positive change among others. To develop creativity and discover one's ideas, Carter, Bishop and Kravits (1996) noted that too much emphasis on practicality could narrow one's scope of ideas, hence the need to assume a broader perspective and explore alternatives. Originality does not only imply something that has never been done before as emphasized by Philips and Pugh (2005:63), Guetzkow, Lamont and Mallard (2004) and Ngoepe (2012) but ultimately coming up with new interpretations and understanding of what most at times has been done before through methodologies (approaches and methods), synthesis of literature and methods, original data (multiple sources and across disciplines), new opinions and insight, mapping and laying out existing theoretical issues in a new way.

Studies on IK management in Ghana have concentrated on libraries as managers of what has been already gathered through digitisation and other preservation measures. Studies conducted by Zablong and Plockey (2015), Plockey (2015), Plockey (2014), Owusu-Ansah (2013) and Dei (2000) pointed out clearly the importance of managing IK and the role of information professional with most of the viewpoints concentrating on the role of public libraries at the forefront. However, emphasis on institutionalizing IK through policies and having structures in place for its management to be statutory in Ghana was not visible. The researcher is therefore motivated to undertake a study of this nature to critically look at information professionals getting involved in the whole process of IKMS and working in partnership with experts in the collection of IK.

As opined by Guetzkow, Lamont and Mallard (2004) by mapping and laying out existing theoretical issues in a new way, originality can be shown. Ngulube (2003:24-25) contends the use of the SECI model as a holistic approach for the management of IK. Nonetheless, the researcher will critically use the information integration theory to put the study in focus by looking at the measures of integration of information (knowledge) which are "value and weight of information". Mungai (2014) and Gourlay (2006) however, points out the deficiencies in the various models including SECI model and explains that the Wegner's community of practice (COP) model is ideal for the management of IK because of its collaborative nature. Njiraine and Le Roux (2010) identified the use of contemporary knowledge management model such as the Earl's KM taxonomy as the most effective for the management of IK. All models adopted as framework for the management of IK have their strength and weaknesses. However, using sections of each model that fits into the study will provide and limit variables to be measured to put the study in focus, help synthesize the information gathered and provide new interpretations to existing knowledge for more informed decisions and policies. Hence, this makes the study original.

Studies on IK predominantly use qualitative methods for collecting and analyzing data. However, to show originality, this particular study used triangulation of methods and theories (interdisciplinary methods and theories), multiple sources of data across different disciplines,

adding new standpoints and asking new questions of which the researcher believes can produce greater outcomes. Furthermore, originality is exhibited through improvements in policies and practices in indigenous knowledge management system (IKMS) in Ghana. By testing ideas that have evolved in the field of IKMS, the researcher is of the view that new policies can be developed where there are weaknesses and policies not feasible, there can be more room for improvement on existing ones.

1.9 CONCEPTUAL FRAMEWORK

Principles that guide research and put a study in context and focus is the theoretical or conceptual framework and as explained by Kemoni (2008), it guides a good research and forms the foundation of the research design (Ngulube 2018:1). Theories are a major aspect of the scientific method of inquiry and are the basis upon which a research flows (Connaway & Powell 2010:47) and as stipulated by Ngulube (2018), they are inseparable from research and enhances the goals of every research. Thus, research loses its value without a theoretical or conceptual foundation. Problems to situations are varied and best articulated when mechanisms are put in place to prioritize variables that are important to be investigated and as explained by Ngulube, Mathipa and Gumbo (2015:54-56) these form the basis for the theoretical framework or conceptual framework. These two terms are used interchangeably but are mutually exclusive. In most situations, researchers use one theory as a basis of understanding a social phenomenon and this as clearly explained by Ngulube (2018) is a theoretical framework. However, this study is based on triangulation of theoretical positions and thus, a conceptual framework was used to investigate the phenomenon of the study. As posited by Ngulube (2018), the researcher used components of different theories that best explained the variables under study and finally came up with a concept developed from the diverse theories, literature, sources and experiences.

Over the years, theoretical approaches to the management of IK have been built on knowledge management models. Different theories have emerged throughout the years as a model for the

management of tacit knowledge. Few amongst them are the theory of organisational knowledge creation or Socialisation Externalisation Combination Internalization (SECI) model (Nonaka & Takeuchi 1995); Demarest model (1997); frameworks for knowledge management (Barclays & Murray 1997); Earl's taxonomy model (Earl 2001); Indigenous Knowledge Governance Framework (Zaman et al 2011); World Bank Knowledge for Development (K4D) (World Bank 2012); Wenger's Community of Practice (COP) model (Wenger et al 2002).

An aspect of the information integration theory which focuses on combining and mixing new information with existing ones to come up with new ideas (Anderson 1981) was adopted. Aspects of collection development are situated in the study based on the guidelines for collection development and have been evaluated by critically examining the objectives for a collection development in academic libraries.

This study adopted theoretical triangulation to guide the structure of the study and put it in context to achieve the purpose of the study. Although the SECI model has been identified by Ngulube (2003) as a holistic approach to managing IK, aspects of the Wegner's COP model which focus on overcoming the individualistic nature of tacit knowledge to a collective form of knowledge that can be shared across boundaries without apprehension fits into the study. World Bank K4D focus on helping countries transition to a knowledge economy to deepen their development process, this aspect was used to ascertain the focus of the study. Earl's knowledge management (KM) taxonomy and Knowledge management assessment tool (KMAT) model make some useful suggestions on reinforcing competencies in institutions through their knowledge system using technology as an interface between information owners and seekers to effectively manage, transfer, communicate and utilize IK for economic development.

These theories were critically studied and helped the researcher adopt some of the components that were suitable for the management of IK by information professionals in academic libraries to develop a conceptual framework for the study. The use of a conceptual framework becomes necessary when it becomes difficult for researchers to situate their research within one theory (Ngulube 2018). The aspect of collection development was not necessarily based on a theory because the researcher believed that it had been incorporated in the models that will be used; only that it does not come out precisely as collection development. However, collection development policies of the various institutions were critically examined to find out whether there were aspects of indigenous knowledge that had been managed and to what extent.

1.10 SCOPE AND DELIMITATION OF THE STUDY

The study focused on all ten public universities in Ghana, namely University of Ghana (UG); Kwame Nkrumah University of Science and Technology (KNUST); University of Cape Coast (UCC); University of Education, Winneba (UEW); University of Development Studies (UDS); University of Professional Studies, Accra (UPSA); University of Mines and Technology (UMAT); University of Health and Allied Sciences (UHAS); Ghana Institute of Management and Professional Administration (GIMPA) and University of Energy and Natural Resources (UENR) (National Accreditation Board 2017). The study was limited to public universities because they are accountable to the government and to a great extent the general public. Again, their activities are not for profit but serve as a mandate, to produce the qualified human resource for the management of the economy of Ghana for accelerated economic growth and social transformation for the benefit of society.

1. 11 LITERATURE REVIEW

Knowledge and its methods of investigations cannot be divorced from people's history, cultural discourse and world view (Owusu-Ansah & Mji 2013). Indigenous knowledge has become a topical issue since the 1980s, and there has been widening interest in this area by many stakeholders in the sciences and humanities among others (Le Roux 2003:107 and Burtis 2012:3). To ease the integration of IK into its operations, the African Department of the World Bank

launched the IK for Development Program in 1998 (Gorjestani 2000:1). IK is all-inclusive and embraces the physical and spiritual aspects of life (Makinde & Shorunke 2013:4).

Despite its importance of contributing significantly to global development knowledge; providing problem-solving strategies for communities and its relevance to development processes, Tella (2007:186) and Ocholla (2007:239) stressed that it continues to be an underutilized and marginalised resource with the consequent limited use in the development process. IK however, should not be seen as being in competition with western knowledge but rather be seen as a knowledge system that can be improved upon to contribute immensely to the global spectrum of knowledge.

Because of its tacit nature, there exists a breakdown of transfer (distortion and embellishment) when the custodian dies. Information professionals thus have a vital role to play in the management process and to ensure that people get access to information from the right source. Okorafor (2010:11) posits that established IK units in libraries could be a resource for researchers. Much responsibility has been put on public and national libraries to take up this role because they serve the information needs of the general public (Kargbo 2005:10; Sithole 2007:118; Moahi 2012:549; Makinde & Shorunke 2013:11). Nevertheless, Academic and Research institutions should be at the centre of the management process because they potentially have the resources (both human and capital) to do so. For this to succeed, there is the need for collaboration between information professionals and indigenous communities. To be able to effectively exercise this mandate, Moahi (2012:550-551) adds that "librarians must partner with other organizations and individuals in communities in order to be able to identify, document and promote indigenous knowledge for sustainable development".

The Department of Science and Technology (2004) of the Republic of South Africa for example developed a model for libraries to manage indigenous knowledge. The role assigns libraries to

facilitate and provide opportunities for communities to actively record and share their history and culture with people in society and use new technology to support Indigenous communities for sustainable development. Increasing interest by scholars to manage IK arise as a result of lack of policies to manage and preserve IK, the unmethodical way in which IK is identified, accumulated, disseminated creating bottlenecks and added to the knowledge systems of the global economy (Ngulube & Lwoga 2010: 118). The detailed literature review is captured in chapter two.

1.12 RESEARCH METHODOLOGY

Conceptualizing research problems and unfolding the phenomenon that is been investigated requires appropriate research methodology (Ngulube 2015:125). Approaches to research span three broad sections, which includes the philosophical assumptions underlying the foundation of the study: the research design and the research methods. The pragmatic paradigm using mixed method approach based on convergent parallel mixed method (CPMM) was adopted for the purpose of this study. This paradigm as justified by Creswell (2014:40) "allows different worldview, multiple methods coupled with different methods and procedure for data collection and analysis". Integrating both qualitative and quantitative approaches gives a complete and a more comprehensive understanding of the research problem, of which applying one approach alone may be deficient (Creswell 2011; Creswell 2009:87-115). CPMM allows researchers to "merge both qualitative and quantitative research, in order to provide a comprehensive analysis of the research problem" (Creswell 2014:33). This enabled the researcher to use different instruments to collect and analyse data to achieve the objectives of the study. The research methodology is covered in detail in chapter three.

1.13 OUTLINE OF CHAPTERS

The study was organised into six chapters and outlined how each chapter of the research was structured and presented. Below is the summary of the respective chapters:

CHAPTER ONE: INTRODUCTION AND BACKGROUND OF THE STUDY

This chapter discusses the introduction/background of the study, statement of the research problem, purpose of the studies, objectives of the study, research questions, scope/delimitations, justification/significance of the study, originality of the study, definition of terms, summary of literature review, summary of research methodology, ethical considerations and outline of chapters.

CHAPTER TWO: LITERATURE REVIEW ON THE MANAGEMENT OF INDIGENOUS KNOWLEDGE SYSTEMS IN PUBLIC UNIVERSITY LIBRARIES IN GHANA

This chapter focuses on the review pertinent literature to help conceptualize the problem to be investigated and identify the gaps in the literature. It discusses different kinds of theories that have been identified and look at the concepts that can be adopted as a conceptual framework for the management of indigenous knowledge.

CHAPTER THREE: RESEARCH METHODOLOGY

This chapter discusses research methodology: research design, research approaches, research methods, study area, target population, sampling procedures/techniques, data collection procedures and the tools for data analysis.

CHAPTER FOUR: PRESENTATION OF THE FINDINGS OF THE STUDY

This chapter focuses on the findings/results of the study.

CHAPTER FIVE: INTERPRETATION OF THE RESEARCH FINDINGS

This chapter discusses the interpretation of the research findings.

CHAPTER SIX: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter deals with the presentation of the summary, conclusion and recommendations from the study and also look at areas for further research.

1.14 SUMMARY

This chapter has given an introduction and a background study of the whole concept of indigenous knowledge management. In the background to the study has been discussed the importance of IKS in our society for its historical, research and academic purposes. There is no doubt IKS is going extinct and the urgent need to effectively manage them before they are lost completely. Major problems surround the management of IKS. More importantly are the issues of the roles to be played by information professionals and at what level, budget constraint, ownership, skills among others. The researcher has given justification to the reasons for conducting this research. Major concepts that are key to the study has been clearly defined and discussed. The uniqueness of this study is shown in the originality and value of the study to existing spectrum of knowledge. Various theories that put the study in perspective has been conceptualized under the theoretical and conceptual framework. Looking at the nature of the study to the entire society, the scope of the study covered public universities that are funded by public taxes and accountable to society. Research methodology has been summarized to give a general idea about the methods of inquiry. The outline of the whole structure of the thesis has been briefly summarized. The chapter that follows will critically discuss the literature review to know what has been done and to identify the gaps in literature. It also looks at the theoretical and conceptual framework to identify the variables that are going to be used to answer the research questions to achieve the objectives of the study.

CHAPTER TWO: LITERATURE REVIEW ON THE MANAGEMENT OF INDIGENOUS KNOWLEDGE MANAGEMENT SYSTEMS IN PUBLIC UNIVERSITY LIBRARIES

2.1 INTRODUCTION

This chapter is on literature review pertinent to the study. It gives the contextual overview of indigenous knowledge management systems (IKMS) and discusses the conceptual framework used for the study. The literature review is discussed according to specific themes based on the objectives of the study and concepts that have been topical in the field of indigenous knowledge management systems. Themes discussed are the general overview of indigenous knowledge management systems, characteristics of indigenous knowledge, manifestation of indigenous knowledge, indigenous knowledge and education, indigenous knowledge and community participation, indigenous knowledge and sustainable development, libraries, information professionals and indigenous knowledge management systems, management of indigenous knowledge and challenges to the management of indigenous knowledge. The conceptual framework is based on the discussion of different models and adopting some constructs in each of the models within which the study is situated.

Figure 2: Research Map of the Literature Review
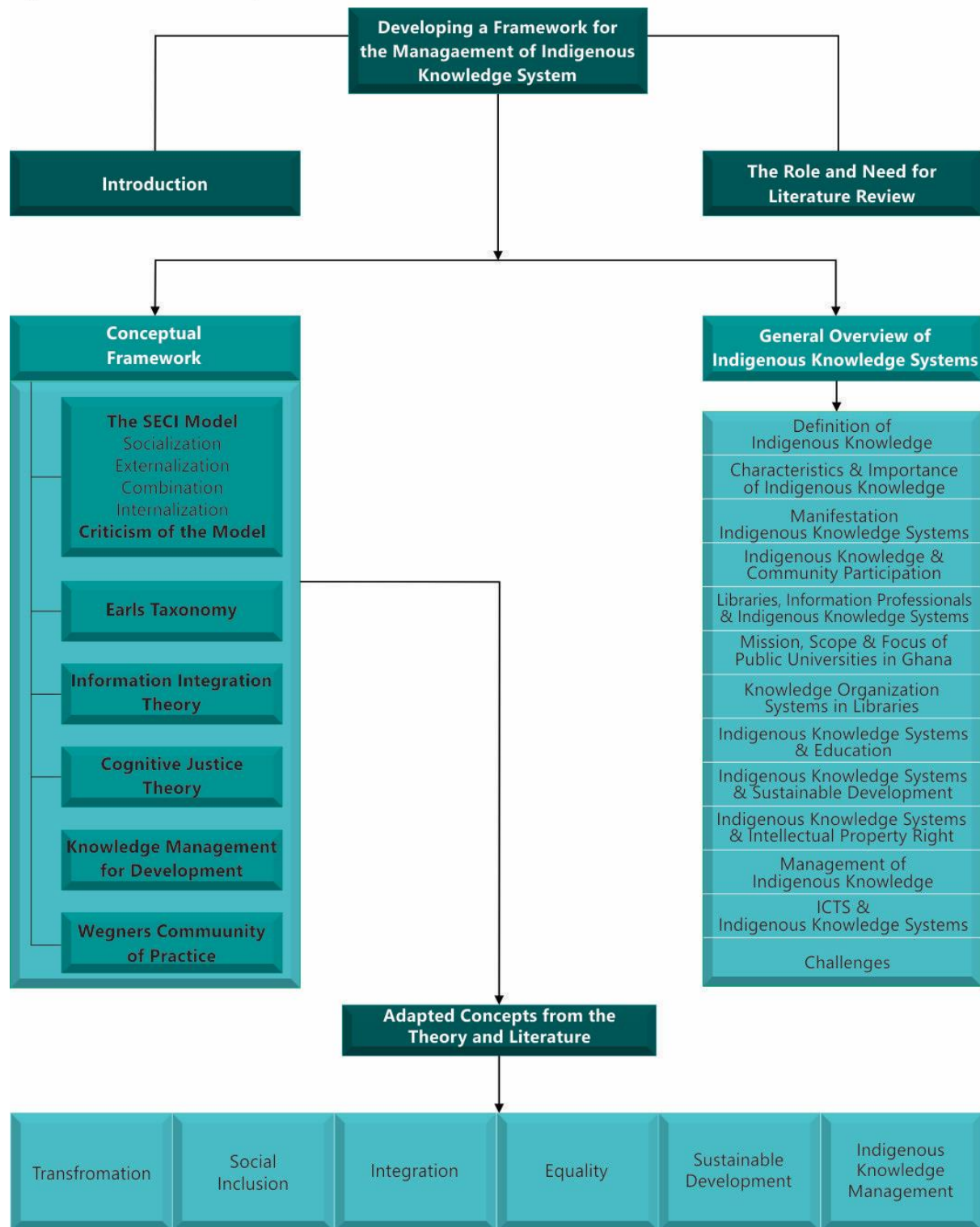
Figure 2.1: Research Map of the literature review

2.1.1 The role and the need for literature review

Every research topic can be discussed and argued out from a different perspective based on the viewpoint of the researcher. To put research work in focus and give it direction, it is important to conduct a literature review which gives researchers and readers an understanding of the background, problems to be investigated, focused objectives and research questions that situates the study in a particular context. Literature review thus serves as a benchmark for researchers to know the history and current occurrences in a study area, identify gaps in the literature if any and ascertain whether a particular topic is researchable or not. In effect, the literature review establishes the foundation, gives historical background and gradual progression in a selected research area.

It is vital for any academic literature review to take a critical approach which involves analysis of both positive and negative features by recognizing the strengths and weaknesses of previous research done by others and articulating why and how researchers think their ideas or theories might be improved (Jesson, Matheson and Lacey 2011:16).

Newman (2013:126) explains the goals of literature as:

1. To demonstrate a familiarity with a body of knowledge and establish credibility.
2. To show the path of prior research and how a current project is linked to it.
3. To integrate and summarize what is known in an area.
4. To learn from others and stimulate new ideas.

Creswell (2014: 28-29) also provides four major forms of literature review as:

1. Identifying key issues in a particular field of study
2. Critiquing previous scholarly works
3. Building bridges between related literature works
4. Integrating what other scholars have done or stated previously.

The aim of the aforementioned procedures is to help researchers investigate problems in the existing field of study, build strong theoretical foundations, test methodologies and research approaches and more importantly add to the existing field of knowledge.

2.2 CONCEPTUAL FRAMEWORK

Research is guided by frameworks which according to Imenda (2014:188) are the lenses to check whether the research findings corroborate or there are inconsistencies in order to determine which framework can be used to explain the research findings. It is therefore essential that researchers are guided by these frameworks which could be theoretical or conceptual. Depending on the nature of research and the problem under study, a researcher may decide to apply a theory or draw concepts from 'one and the same' theory to better explain the objects or phenomenon of interest which is described as "*theoretical framework*". Another researcher, on the other hand, depending on the nature of the research may not be able to explain events using one or same theory and thus use different concepts from existing models and literature to clearly describe the object or phenomenon of study referred to as a "*conceptual framework*". This according to Imenda (2014:189) and as clearly explained by Leilr and Smith (1999) represents an 'integrated' way of looking at the research problem.

Like the various misconceptions about the use of research designs and approaches, there are also general misconceptions and ongoing debates on the use of a theoretical and conceptual frameworks. To create certainty and clear understanding on when to use a theoretical or conceptual framework, scholars like Ngulube (2018), Imenda (2014), Vithal, Jansen and Jansen (2013), Nieswiadomy (2012) among others came up with a clear distinction between the two frameworks. Vithal et al (2013:17-19) posit that a conceptual framework is a less-developed explanation of events whiles theoretical framework is a well-developed coherent explanation of an event or phenomenon. This is not to say that the use of one framework has a greater advantage over the other but as explained earlier, a researcher has to critically examine the problem under study to determine the framework that will be suitable for his/her study depending on the variables that are

been considered. Miles and Huberman (1994:18) concurs that a conceptual framework explains "the main things to be studied, the key factors, constructs or variables and the presumed relationships among them". Whilst a theoretical framework gives a general explanation of relationships between concepts of interest in a study and based on one existing theory, Nieswiadomy (2012:87,94-95) asserts that a conceptual framework links concepts from several theories from previous research results and/or from researchers own experience. Ngulube, Mathipa and Gumbo (2015:48) further explain that conceptual framework although are less developed than theories, assist in establishing coherence in research. Categorically, a conceptual framework as clarified by Ngulube (2018:9) are concepts derived from various theories that serves as a guide for the research from data collection through data analysis to answer the research questions.

While it has been tested and established by Ngulube (2002) that the SECI (socialisation, externalisation, combination and internalisation) model provides a holistic approach to the management of IK, the researcher realised that other theories such as the Wenger's Community of Practice (COP) model, Earl's Taxonomy Model, World Bank Knowledge for Development (K4D), Information Integration Theory and Cognitive Justice Theory provides aspects that can be integrated and used to effectively manage indigenous knowledge (IK). Therefore, for the purposes of this study, a conceptual framework using key related aspects of concepts integrated to explain the research problem was used as the mirror to guide the study.

2.2.1 The SECI model and its applicability to the management of IK

The Organizational Theory propounded by Nonaka and Takeuchi (1995) based on the social interaction between tacit and explicit knowledge through socialisation, externalisation, combination and internalisation are seen as the four modes of knowledge transformation and conversion. Popularly known as the SECI Model in library sciences, this theory was tested and used in Japanese firms and it was established that the reason for the successes of these firms over western firms was the incorporation of both tacit and explicit knowledge into Japanese business processes and the fact that they see both knowledge systems as complementary and vital to each

other by interacting and interchanging with each other (Mungai 2014:25-26). Nonaka and Takeuchi (1995) categorised four modes of knowledge conversion. Mbatha (2013:17) and Ngulube (2003) demonstrate these four modes of knowledge creation as extremely useful and can be effectively used to manage the different forms of tacit knowledge both in communities and organisations by capturing, storing, processing, retrieving and disseminating IK across space and time and offers the best mode to capture, create, leverage and retain knowledge. The elements of the SECI model are discussed below.

2.2.1.1. Socialisation (Conversion of tacit knowledge to tacit knowledge)

Ngulube (2003:21) opined that tacit knowledge can be converted into explicit knowledge and conversely. He adds that the SECI model produced by Nonaka and Takeuchi (1995) through Socialisation, Externalisation, Combination and Internalization links tacit and explicit knowledge. The tacit nature of IK embedded in the minds of people, acquired through experiential learning and perfected through trial and error appears to be impossible to manage such knowledge system. By interacting with people, a person can acquire tacit knowledge without language. The mode of acquiring this form of knowledge is basically through direct interaction with people through shared experiences by practice, imitation and observation (Mbatha 2013:178; Nonaka and Takeuchi 1995).

To exhibit the possibilities of managing such a knowledge system, Ngulube (2003) asserts that through artefacts, music, dance, songs, storytelling among others tacit knowledge can be converted into explicit knowledge and reciprocally. He further explained that knowledge can be classified as tacit (resides in the minds of people) or explicit (tangible and declarative knowledge expressed through symbols and codes). Through conversations (face to face), social interaction, music and dance, storytelling is communicated through oral means and gesture. Through socialisation, individuals and communities can share their knowledge systems. These forms of communication were the main tool for sending messages across and transmitting knowledge by pre-colonial societies (Ngulube 2003:24). During such periods especially in Ghana, people communicated their

problems, opinions and grievances through songs, folktales, proverbs, music, dance and myths. In the millennial, socialisation although in different forms such as videos calls and meetings, social forums etc. are still useful medium for the masses of people to communicate.

2.2.1.2 Externalisation (Conversion of tacit knowledge to explicit knowledge)

This is where tacit knowledge is documented to become explicit knowledge through dialogue, interaction and reflection and according to Ngulube (2003) it is one of the primary elements in managing IK. Through the processes of documentation either by records (transcribing in the form of writing into documents), painting, pictures or images, videos in different format, Ngulube (2003:25) explains that tacit knowledge can be converted into explicit knowledge through the process of externalisation, where the knowledge can be accessed and retrieved as a secondary form in the absence of the person holding the tacit knowledge. The externalisation of IK according to Ngulube (2003:25) is evident through indigenous technologies and artefacts.

2.2.1.3 Combination (Conversion of explicit knowledge to explicit knowledge)

This involves converting explicit knowledge into explicit knowledge. Thus, Ngulube (2003: 25) opined that explicit knowledge can be converted into explicit knowledge which is a secondary (documented) form of knowledge that can be used to make another secondary form of knowledge. For example, people can enhance on an artefact and create something out of it from a diverse perspective.

2.2.1.4 Internalisation (Conversion of explicit knowledge to tacit knowledge)

This involves a process of converting explicit knowledge to tacit knowledge by developing new knowledge in the minds of people through knowledge from documented sources, artefacts etc. that can be transferred to others Ngulube 2003:27). By its dynamic nature and its adaptability to change through technological advancement, explicit knowledge can be converted into tacit knowledge through the process of internalization. For example, researchers acquire knowledge through

reading and collecting and analysing data through questionnaires, interviews and observations which manifest in the form of research findings and additions to knowledge that can be shared with others through publications, forums and other social interactions. The management of IK raises the question of how such knowledge system which is tacit, intrinsic in people's activities and way of life can be documented, codified, shared with the rest of the world and incorporated into economic activities that can contribute to sustainable development. With these concerns, Ngulube (2003) points out that IK can be communicated, documented, codified and preserved using conventional means of socialisation, externalisation, combination and internalisation (SECI) to relate tacit to explicit knowledge as described by Nonaka and Takeuchi (1995) in an organizational context.

2.2.1.5 Criticism of the SECI model

Like most models, the SECI model has also been criticised. Becerra-Fernandez and Sabherwal (2001) argue that the SECI model may not be universally applicable and may largely depend on context and other factors such as organizational culture to work because of low use of the externalisation process. Poell and Van der Krogt (2003) adds that the way people work in an organization has a greater influence on how they learn and thus, the generalizability of the SECI model across organizations tends to be problematic and tied to rigid bureaucratic principles. Considering its applicability to other cultural contexts, Glisby and Holden (2003) conclude that the SECI model may not be appropriate. Lyude (2007:174) in agreeing with Gourlay (2006) discoursed that the SECI model should be seen as a map directing knowledge management practices rather than a model because in terms of theoretical and methodological grounds, the model is flawed and limited in context in terms of its generalizability. Although there are contentions that the SECI does not have a sound empirical grounding, it has been demonstrated by Ngulube (2003) that there are clear possibilities to transform and convert different knowledge systems and that knowledge of any kind is manageable if properly harnessed, can contribute immensely to sustainable development in Africa.

2.2.2 Earl's taxonomy model

The model is based on three (3) key schools of thought in knowledge management, which are; the technocratic school (consists of codified systems), the commercial school (using codified systems to manage intellectual assets) and the behavioural school (mainly concerned with personal knowledge). The model is characterized by codification, connectivity, capability, commercialization, collaboration, and consciousness by factoring in the use of ICTs for effective impact and management (Njiraine & Le Roux 2010; Earl 2001). It has been established that tacit knowledge can be wholly and effectively managed using codified systems in the form of knowledge processes, knowledge bases (repositories) and knowledge directories. The Earl model focuses on the different stages of managing organisational knowledge systems as it encompasses all aspects that can accommodate an entire community's lifecycle. It is, however, of importance to note that no one school outperforms the other and the schools in itself are mutually exclusive.

The main focus of the technocratic school of thought is the use of ICTs as a platform between knowledge owners and knowledge seekers and is based on information and management technologies that support everyday activities of workers (Earl 2001). Tacit knowledge is codified through recording and transcribing them into understandable forms to be shared, transferred and stored to make it available, accessible and usable. This is where explicit knowledge can be converted into tacit knowledge. The behavioural school of thought considers knowledge communities that bring together knowledge and knowledge owners and focuses on providing space to facilitate knowledge exchange as an intellectual capital development. According to Earl (2001) and as used by Njiraine and Le Roux (2010:822-823), by using existing ICTs, knowledge can be captured, stored and disseminated in conventional formats. Hence, by following these procedures, IK can be integrated and mainstreamed into the global knowledge system if recognized and appreciated by all stakeholders. The commercial school of thought focuses on making financial benefits out of intellectual assets. It emphasizes making revenue streams from the exploitation of knowledge and intellectual capital (Njiraine & Le Roux 2010). IK is an intellectual asset of communities and this becomes their intellectual property or knowledge property. It has become imperative to identify and protect originators of such vital knowledge to benefit from its economic

potentials due to its overexploitation (Njiraine & Le Roux 2010). Communities can thus make financial benefits if IK is well managed and preserved. This can only be profitable if they are backed by evidenced-based policies. A good example is the development of IKS policies by South Africa and Kenya which provides frameworks in terms of bio-piracy, benefit sharing and recognition of knowledge holders.

2.2.3 Information integration theory (IIT)

The Information Integration Theory (IIT) is based on the assumption that attitudes are formed and changes by combining new information with existing thoughts. Developed and tested through experiments by Norman Anderson (1979), the theory posits that every piece of relevant information has two basic qualities which are "Value" and "Weight". Value is the evaluation of the information and it can either be favourable or unfavourable. Weight is the perceived importance of the information. Thus, people's attitudes are highly influenced by the important qualities in terms of weight and value they place on information and this creates new attitudes and perceptions in them. The usefulness of this theory to the effective management and use of IK in sustainable development agendas reflects a purpose that for IK to be seen as a type of knowledge system that is not marginalised. This means all stakeholders including policymakers must place higher weight and value on IK and consequently integrate it into appropriate sectors of the economy including education, health/medicine, agriculture, politics, conflict resolutions, land tenure system, natural resource management amongst others. Once the importance of IK is reflected and succeeds in local economies, it will gradually extend to the global economy for its maximum utilization.

2.2.4 Cognitive justice theory (CJT)

The idea of universalism globally called for the need for democracy of knowledge systems which brought about the concept of cognitive justice. The cognitive concept as propounded by Visvanathan in the 90s identifies the right to different forms of knowledge to co-exist and go

beyond tolerance to an active appreciation of the need for diversity and ways of life (Visvanathan 2009). The underlining principle of cognitive justice is diversity, plurality, inclusiveness and equality to guarantee other paths and solutions to problems within a culture to create a new self-reflexive idea of democracy around actual communities of practice (Leibowitz 2017:101; Visvanathan 2009). By implication, the same problem in different jurisdictions might require different solutions based on the culture and nurturing processes in each geographical region. Leibowitz (2017) adds that the present context of the hegemony of knowledge of total acceptability of western forms of knowledge as pre-eminent poses the problem of inequity and social injustice globally. This situation has been described by Visvanathan (2012) as accepting western knowledge and presenting IK "without a voice, museumified, lost and destroyed." Applying cognitive justice in the field of library and information sciences, Burgess (2015) explains the need for diversity of solutions using both indigenous and western knowledge for dynamism and flexibility. Thus Nkata (2003) contends that there must be ways to integrate IK within current library systems as a way to eradicating past mistakes (such as marginalisation of IK through colonialism).

2.2.5 World Bank Knowledge for Development (K4D)

The economic and institutional regime, education and skills, information and communication infrastructure and innovation system are the main pillars of the knowledge economy which requires effective action through reform, investment and coordination (World Bank 2008:5). Based on this, the World Bank K4D program works to create awareness among national policymakers of the powerful growth effects of knowledge. The programme further to encourages economic actors to combine global and local knowledge to accentuate comparative advantage and to help leaders to build institutions that foster rather than discourage individual attempts to exploit the competitive opportunities available. Furthermore, such a programme enables to knowledge-powered enterprises to design knowledge-based strategies that leverage a country's strength to attain its development goals. The economic and institutional regime requires countries to provide incentives for the efficient use of existing knowledge, the acquisition of new knowledge and the application of both economic activities to improve productivity, raise quality, innovate and launch new enterprises. People everywhere need education and skills to enable them to create and share

knowledge and to use it well. The World Bank (2012) elaborate on the need for information and communication infrastructure to provide a dynamic information infrastructure needed to facilitate the effective communication, dissemination and processing of information. Lastly, a country's innovation systems which include firms, research centres, universities experts, consultants and other organisations must be capable of tapping the growing stock of global knowledge, assimilating and adapting it to local needs, and creating new technology that underpins the development of new products and processes that can compete in export markets and meet needs at home.

2.2.6 Wegner's Community of Practice (COP) Model

Wegner et al (2002) define COP as groups of people who share a concern, a set of problems or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis. Communities of practice are therefore company of experts drawn from different backgrounds who come together with the main purpose to share their expertise and knowledge by dissecting social, cultural, political and economic problems to come up with the best possible solutions through their interactions and learning from each other. These people according to Wegner et al (2002:4-5) meet because they find value in their interaction. However, these groups of people may not necessarily work together on a daily basis but as they spend time together, they share information, insights and advice thereby helping each other solve problems by discussing their situations, aspirations and needs. According to Wegner et al (2002) COP may create tools, standards, generic designs, manuals and other documents to understand what they share. These become multi-membership learning cycles that provides a space for practitioners from varied fields to connect across geographical and organisational boundaries. These enable them to better respond to the shift in market demands to come up with clear and better solutions and products for national and global development by applying knowledge capital through socialisation and internalisation (Mungai 2014:26-30). By so doing, tacit knowledge is captured, validated and codified using technology. These groups could be at home, school, institutions, community, hobbies amongst others and when cultivated in strategic areas can be a practical way to manage knowledge as an asset.

COP provides a platform for collective learning through coaching, apprenticeship, conversation by participation as well as collaboration by group members through interaction and socialisation. This is where knowledge can be codified and documented (Mungai 2014). Groups in COP are made up of core group (leadership of COP), active group (members who meet regularly), peripheral group (members who observe the interactions of core and active groups) and outsiders (groups that have interest in COP but are not members) (Mungai 2014; Wegner et al 2002). COP incorporate all the key elements needed for the effective management of IK by bringing together all expertise who can be involved in the capturing, storing, documentation, dissemination and preservation of IK. Consequently, it makes use of collective efforts by all who are involved to ensure the management of IK. By bringing together various stakeholders and creating a platform for sharing of ideas, members of the community can collaborate and partner with institutions to manage their IK as a strategic resource where knowledge can be shared without boundaries and economic benefits and financial gains made through the protection of their intellectual property (patenting).

2.2.6.1 Application of COP to the management of IK

The COP model is centred on the management of tacit knowledge through a systematic process of acquiring, organising, sustaining and renewing tacit knowledge of people in organisations. This is done in order to use such inherent knowledge for innovation and to achieve competitiveness. The focus on tacit knowledge which is both individualistic and collective in nature through experiential learning. The experiential learning reflects the characteristics of IK and how it can be managed through COP based on its multi membership cycle incorporating inclusiveness, dynamism, experiential knowledge, expertise and most importantly sharing knowledge without boundaries. Thus, through the use of COP, IK can be effectively managed by collecting, documenting, storing, sharing (using different medium) through the use of technology. The application of COP depicts that information professionals, custodians of K, IT experts, interested persons and institutions, and all stakeholders can partner to ensure that IK is managed and preserved as a strategic resource for

sustainable growth. Mungai (2014) used the model to manage tacit knowledge in Kenya and revealed a higher rate of competitive advantage in organisations that managed such knowledge as a strategic resource. Wegner et al (2002:6) described that for organisations to succeed, they need to become more intentional and systematic about managing any form of knowledge to give them a competitive advantage over others.

Table 2.1 below gives a brief picture of the concepts that have been identified from each of the models used.

Table 2.1: Conceptual Framework

Conceptual Framework			
	Models Used	**Key Concepts Identified**	Integration of Indigenous Knowledge
1	SECI Model	Transformation and Management of IK	
2	Communities of Practice	Social Inclusion	
3	Earl's Taxonomy	Transformation, Social Inclusion and Management of IK	
4	Knowledge Management for Development	Transformation, Social Inclusion, Integration and Sustainable Development	
5	Cognitive Justice Theory	Social Inclusion, Integration and Equality	
6	Information Integration Theory	Integration	

Source: Synthesis from Literature (2019)

2.2.7 Adapted Concepts from the Theories and Literature

The effective management of IK and its integration into the global knowledge system for its efficient utilization requires a process of transformation. From the Six models that were identified, six (6) key constructs were established. These are *transformation, integration, social inclusion, equality, management of IK and sustainable development*. For institutions or nations at large to capitalize and effectively use IK in national development agenda to achieve sustainable development goals, these six key constructs will determine acceptability, accessibility and usability of IK.

2.2.7.1 Transformation

For institutions to accept IK as a viable form of knowledge and a strategic resource to enhance development, a transformation is crucial. There is the need for transformation in terms of policies that guide the collection management activities of libraries. Mhlongo (2018:52) explains the need for transformation at national and societal levels to reflect change in governance, public and economic policies which are directed at supporting the status quo. The driving force behind the transformation is first determined by acceptability by renewing mindsets and change in attitudes depending on the value of information and knowledge. The indicators used to measure the level of transformation as used by Mhlongo (2018) are:

1. Staff qualification and diversity
2. Appropriate collections (dependent on the collection development policies of the universities)
3. Programmes and services for indigenous communities (starting from the immediate communities within which the universities are located).

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2.2.7.2 Social Inclusion

Social inclusion involves community participation where information professionals' partner with communities, organisations and stakeholders to be able to capture, document and promote IK. Mhlongo (2018:56) explains that social inclusion is a vital aspect of integration where inequalities assist in minimising marginalisation. As part of the library's mandate as stated by IFLA (2012) libraries must partner with elders of communities in the production of IK, create awareness by educating people to understand and appreciate IK. Information professionals must, therefore, collaborate with communities that they serve and interact with custodians of IK in order to identify and collect it (Moahi 2012:549).

The indicators for social inclusion according to Mhlongo (2018) are:

1. Library's collections (collection development)
2. Library's programmes and services as indicators for social inclusion and

2.2.7.3 Integration

Integration is bringing together different components or processes of a system or activity together to function as one (Rouse 2015). The knowledge management strategy adopted over the years by libraries is modelled after the western system of knowledge organisation which creates room for inequalities. Hence, the management of IK is not a core part of libraries whose role is to organise and manage all forms of knowledge to the benefit of their varied users and the communities they serve. To ensure sustainable solutions to developmental challenges especially in local communities, it is imperative for IK to co-exist meaningfully with western/scientific knowledge which are empowered through codification, documentation and translation (Dhewa 2011:53). Integrating IK into the collection development activities and to a large extent knowledge management role of academic libraries requires making IK accessible for the benefit of societies. The indicators for integration according to Mhlongo (2018) is by integrating IK into the collections and services of libraries.

2.2.7.4 Equality

Indigenous Knowledge is an inherent part of every community since it informs their way of life (through conflict resolution, religion, medicine, agriculture, natural resource management, savings and loans etc.). Indigenous communities over the years according to Hayes (2010:639) "have experienced social injustices, marginalisation and impoverishment for the purposes of scientific advancement." Information professionals who have the requisite expertise to implement programmes to collect, preserve and disseminate IK resources must partner with IK communities and custodians of IK to publicise the value of IK, convince the government to come up with IK policy frameworks to support the collection and management of IK (IFLA 2012). The concept of equality in this context is for economies globally to recognise the diversity of knowledge not only as methods but as ways of life. Accordingly, there should be the representation of IK and acceptance of the right of multiple forms of knowledge to coexist and complement the strength and weaknesses in each other.

2.2.7.5 Sustainable Development

Elements considered as facilitators of sustainable development in this regard relates to cooperation/partnership, inclusion, social justice, equity, fairness and capacity building. Brohman (1996) opined that sustainable development ultimately depends on the daily actions of local people pursuing a diversity of plans aimed at securing their livelihood. Sustaining development to promote socio-economic growth requires building indigenous capacity for knowledge creation and information dissemination (Al-roubaie 2010:127).

2.2.7.6 Indigenous Knowledge Management

The effective management of IK requires libraries to be proactive and as discussed by Chisita (2011:9) promote community publishing or for communities to document their experiences with others. For the two major forms of knowledge to have equal representation, libraries must have programmes to repackage IK in a form that resort to tackling societal problems to enhance growth. This can help facilitate the process of integration and convergence of the two knowledge systems.

Through stakeholder's participation, the process of recording and documentation of IK through collaborative research can be aided and by that, there can be indigenous representations. Chisita (2011:10) recommends strengthening synergies between stakeholders, promoting community engagement, providing space to integrate indigenous and western knowledge and utilizing ICTs to repackage information to meet users needs will facilitate the management of IK and its integration with western knowledge. The management of IK thus requires collecting IK, documentation, codification, storing, accessibility/usability and ultimate preservation. These can be facilitated with the use of ICTs using appropriate media and technology. Figure 2.1 shows the adapted concepts from the models used.
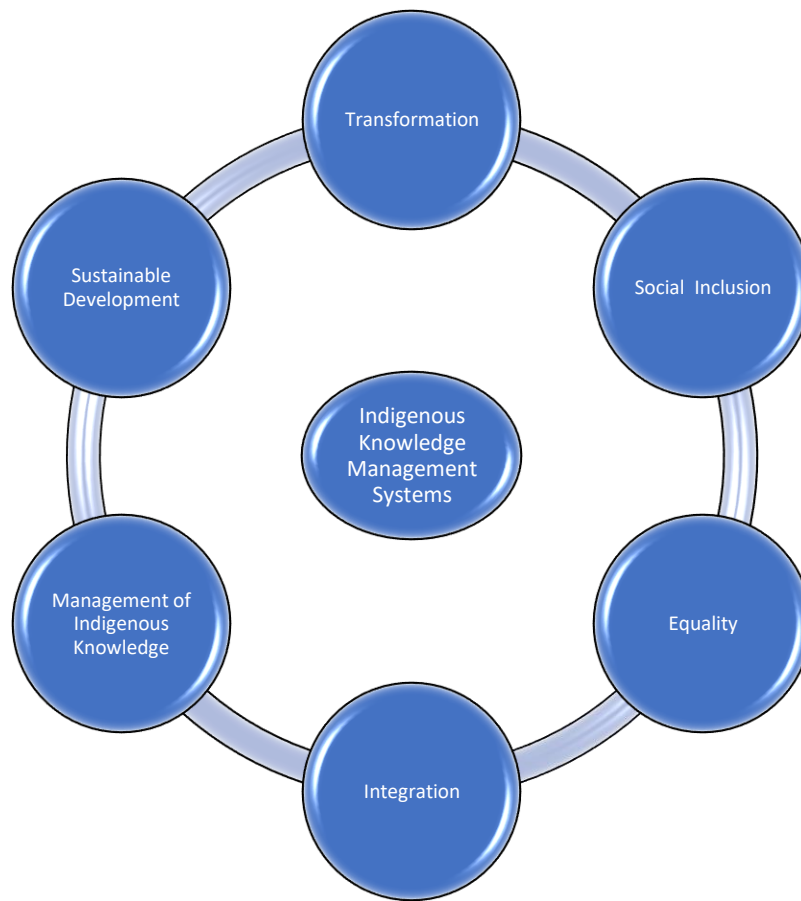
Figure 2.2: Adapted Concepts from the Theories and Models

2.3 GENERAL OVERVIEW OF INDIGENOUS KNOWLEDGE SYSTEMS

Several terms have been used to describe indigenous knowledge by different scholars looking at the context and field of discipline. Notwithstanding, they all give the same meaning. These terms include but not limited to *Indigenous Technical Knowledge (ITK), Local Knowledge (LK), Traditional Knowledge (TK), Ethnoecology, Rural People's Knowledge (RPK), Indigenous Skills, Ethnoscience, Cultural Knowledge (CK), Peoples' Science, Folk Knowledge* (Mahwasane 2017:77; Ngulube 2003:2; Chisenga 2002:1). Based on the various disciplines, what is common among specific definitions that run through all the definitions is that IK is the knowledge that people in a given community have developed over time (often tested over centuries of use), based on experience, adapted to the local culture and environment, dynamic and changing (International Institute of Rural Reconstruction 1996). Communities globally have got storehouses of IK and according to Nyumba (2006:1) these have been handed down by word of mouth across generations consciously or unconsciously over the years. Thus, every community whether rural or urban have some indigenous knowledge and such knowledge as explained by INASP (2002) is created and exchanged when the motives of community members are triggered and when they have the opportunities as well as the necessary means and skills to do so.

The evolution of knowledge systems is created through humans' interaction with their environment, themselves and nature (Sarkhel 2016:427). Before civilization, communities have survived, nurtured, learned and managed their own affairs on health, agriculture, beliefs, housing, leadership and conflict management based on their fundamental knowledge popularly referred to as indigenous knowledge. This knowledge passed on through generations orally becomes a part of anyone one who lives and grows in a particular community. It is an asset to the social and economic growth of communities' sustainable development. Due to its tacit nature and oral form, IK rest in the minds of older generations who have experienced and use it continually and thus have become experts in its concepts and use. However, because IK is not documented, most older generations die along with it and thus its contribution to the global spectrum of knowledge is minimal (Kathlee 2016; Huaman & Sriraman 2015). As part of Africa's uprising, it has been realised by scholars, professionals and development institutions such as the World Bank, United Nations and UNESCO

have realized that tapping into this rich knowledge base of indigenous societies' is the way forward to address issues that can positively impact their growth and development. The talk of indigenous knowledge as perceived by many is linked to something rural. However, the International Institute of Rural Reconstruction (1996) debunks this by explicitly explaining that IK is not confined to tribal groups or the original inhabitants of an area or rural people.

2.3.1 Definitions of Indigenous Knowledge Systems

Indigenous knowledge has been defined and presented by numerous scholars in different ways. There is no single definition or concept for IK. The various definitions are based on the context in which one decides to situate it. What runs through the various definitions is that IK is local knowledge and forms part of everyday life (work and culture) of people in a community. It is critical to note that the term indigenous knowledge (IK) and indigenous knowledge systems (IKS) are the same and mostly used interchangeably.

As a body of knowledge and belief system, IK is built by a group of people and handed down to generations through oral traditions. This involves relationship between man and their environment and a system of self-management that governs resource use (Chisenga 2002:16-17). IK is therefore the foundation for local-level decision making in agriculture, healthcare, food preparation, education, natural resource management and a congregation of other events in rural societies (Warren 1991; Owiny, Mehta and Marctzki 2014). From the perspective of the United Nations, however, IK is the understanding, skills and philosophies developed by societies with long histories of interaction with their natural surroundings. For rural and indigenous people, IK informs decision-making about fundamental aspects of day-to-day life and it is integral to a cultural complex that also encompasses language, systems of classification, resource use practice, social interactions, ritual and spirituality (United Nations 2006). In contrasts with the international knowledge system generated by universities, research institutions and private firms, IK is the local knowledge that is unique to a given culture or society. Although the definition embraces the everyday aspect of people in the community, it limits it to just rural communities. IK represents a

"hidden reservoir of underutilized creativity and knowledge that could be harnessed, not only as a heritage from the past but also as a means and process for articulating what local people know and involving them in the creation of new knowledge required for development" (United Nations 2006).

Considering its dynamic nature, IK is knowledge that people in a given community have developed over time and continue to develop based on experience, often tested over centuries of use, adapted to the local culture and environment, dynamic and changing, embedded in community practices, institutions, relationships and rituals not confined to tribal groups or the original inhabitants of an area or to rural people (International Institute of Rural Reconstruction 1996; World Bank 1998). The definition given by IIRR (1996) incorporates every aspect of the way people live in society and the improvement and changing dynamics as a result of systems changing as the years unfold. Thus, every community be it rural or urban, indigenous or not possesses IK. This definition also expands the scope of IK and disputes the debate that IK is knowledge of the poor and people in rural communities. It can be gleaned that IK is a part of the everyday life and activities of people within a particular area.

Looking at its tacit nature, mode of communication and transfer, IK is experiential, unique and embedded in the heads, activities and practices of communities with long histories of close interaction with the natural environment across cultures and geographical spaces, largely tacit and orally communicated, and used by local communities for decision-making (Ellen and Harris 2000; Ngulube 2002:95; World Bank 1998). Mascarenhas (2004:5) adds that IK is the sum total of knowledge which people in a particular geographic area possess and which enable them to get the most out of their natural environment.

The South African Research and Documentation Centre (n.d.) defines IK as the body of knowledge and beliefs built by a group of people and handed down to generations through oral tradition about

the relationship between living being and their environment. It includes a system of organisation, a set of empirical observations about the local environment and a system of self-management that govern resource use and developed around specific conditions of women and men indigenous to a particular geographic area (Grenier 1998). IK is also seen as the totality of all knowledge and practices established on past experiences and observations that are held and used by people (Masango 2010).

Based on the definitions given, IK can be categorised as common knowledge, shared knowledge and specialised knowledge. As common knowledge, IK is the knowledge that is held by the majority of people in a community (Nyumba 2006:3). For example, In Ghana, *'Kente'* is one of the ceremonial clothing used by the Asantes (tribe) for special occasions such as festivals, traditional marriage ceremonies etc. and the leading town for the production of Kente is Bonwire in the Ashanti region. This is common knowledge known by indigenous Ghanaians. IK can also be categorised as shared knowledge which according to Nyumba (2006:3) are held by many but not all community members. For example, farmers within a community would know which type of crop to grow in each season and the period for a bountiful harvest. This knowledge is shared by people who engage in farming in the community and this knowledge is common to them. IK could also be specialised knowledge which is held by people who have received training through years of apprenticeship. This type of specialised knowledge is only known by people who through observation and experiential learning have acquired the expertise in a specialised field. For example, the art of weaving Kente is known to people who have learned and acquired the skill. The fact that a person stays at Bonwire, one major town for the production of Kente does not qualify him/her to be a Kente weaver. From the various definitions given, what stands out clear is that IK is the totality of people's way life peculiar to a particular culture, region or society and forms the basis of survival methods of community wisdom gained through observations and teaching from generation to generation of living in a particular community (Kaniki & Mphahlele 2000; Mabawonku 2005; Abioye &Oluwaniyi 2017; Anyira 2010).

2.3.2 Characteristic and Importance of Indigenous Knowledge Systems

1. IK is holistic and dynamic

Dynamism is one of the key characteristics of IK. Although indigenous knowledge is passed down from one generation to the other, each generation adapts and add to IK based on the changing circumstances, social and environmental condition (Mascarenhas 2004:5). Thus, communities build on their IK by adjusting the current needs and trends of society. Cajete (2000) opined that IK has persistently adapted to the contemporary world since the beginning of civilization and it will keep changing.

2. IK is community based and unique to societies

Every community whether rural or urban possesses indigenous knowledge. IIRR (1996) further explains that IK is not confined to tribal groups or the original inhabitants of an area. IK is entrenched in society and known to a group of people. This knowledge according to Mascarenhas (2004:5) enables people within the community to get the most out of their environment. For example, people living along the coast in Ghana such as Cape Coast and Accra where fishing is one of the major forms of livelihoods have developed the expertise in fishing and know the various strategies to use in such activities. IK is based on oral traditions and once a person becomes a part of a community, such traditions are naturally handed over consciously or unconsciously (common knowledge). The uniqueness of IK is exhibited through activities which are peculiar and predominant in a particular community. For example, in Ghana, the Northern region is known predominantly for the production of shea butter and rearing of cattle. Thus, shea butter and cattle rearing are unique to the people of the northern region.

3. IK is tacit in nature and shared through oral communication systems

IK is communicated and transferred through oral means in communities' local languages. Thus, one would have to understand the community's language before IK can be transmitted. Interestingly, the oral nature of IK has contributed to its marginalisation. However, Ngulube (2003:23) argues that orality is not equivalent to backwardness and lack of innovation which is the notion of many. The notion that any knowledge that is considered valid and true should be in written form is disputed by indigenous scholars such as Derrida (1967) who states that the aim of writing is to represent a language which facilitates communication and sharing of ideas amongst

people. And as further clarified by Ngulube (2003:23), knowledge irrespective of its nature can be scientific without codification and emphasized that "language is superior to writing". The idea of codification and documentation of IK is to ensure that the knowledge does not become extinct when the custodians die, so that future generation can build on innovations and transformation.

4. IK is based on experiential learning

All knowledge has its source in IK which is based on practices, ideas, experiences and information created amongst local communities or elsewhere, although sometimes malformed by indigenes and fused into their daily activities and way of life (Raseroka 2002:3; Ina Hoi Riwa Foundation:2002). The enhancement of one's knowledge brings about innovations by improving on ideas through experimentation (trial and error) which is one major feature of IK. IK is based on ideas, experience, practices and information that has been generated either locally (or elsewhere) and have been transformed by local people and incorporated into their way of life. Thus, skills are passed on from family to family, neighbour to neighbour, master to apprentice etc. Skills and expertise are only acquired directly or indirectly from people one lives with or understudy on a daily basis.

5. IK runs through generations

IK is community-based knowledge that runs from generations to generations. It is common knowledge in society but the richness of this knowledge rests in the minds of elders in communities and people who have used this knowledge continuously and perfectly understand it. For example, in Ghana, the Akans practice the matrilineal system of inheritance where people inherit properties from the mother's lineage. This form of knowledge is common to Ghanaians. However, herbal practitioners such as indigenous midwifery in communities is a specialised knowledge that has been learnt, taught and developed through years of practice and experience and so not everyone in the community possesses such knowledge.

6. IK is outside mainstream publishing and print traditions which are the core of library, archival and institutional collections (Hurley, Kostelecky & Aguilar 2017:124).

Unlike mainstream publishing where one's ideas are gathered, documented and disseminated on accessible media, IK rest in the minds of people through their experiences and are not documented.

It is obviously impossible to manage knowledge that rests in the mind of people unless they are willing to share it. This, however, poses a challenge to academic libraries, whose core mandate is the management of institutional and archival collections which are in the form of documented print or videos.

2.4 Manifestations of Indigenous Knowledge Systems

Majority of Africans are predominantly dependent on IK for their livelihood. This is manifested through informal education, agriculture, traditional medicine, arts and craft, music and dance, natural resources management, weather and climate, chieftaincy, festival, conflict resolution among others. Sarkhel (2016: 430) outlines the manifestation of IK to include (but not limited to) information, practices and technology, beliefs, nutrition, health, veterinary care, human resources, education, communication, agriculture and fisheries, food and technology, tools, handicrafts, performing arts, religion and astrology among others. These manifestations of IK are reflected in the daily life and activities of people within a community and forms the foundation and growth in their livelihoods. The skills in all of these activities and practices are tacit and manifested through oral forms of communication. However, these forms of manifestation of IK is threatened by modernization, urbanization and globalisation (Chisenga 2002:2) which considers activities and practices which are not documented as invalid and unscientific. IK practices in medicine, agriculture, forestry, fishing, weather forecast, festivals among others in Africa contributes tremendously to the development of society. Few people and organisations in most parts of Africa use mechanised systems for these activities whiles the masses of people especially in rural communities still use indigenous practices for such activities. Seepe (2001) adds that "African indigenous knowledge systems are not only about artefacts for tourist attraction, but they are about exploring indigenous technologies, medicine and pharmacology, atmospheric management techniques, forest resource exploitation, architecture, knowledge transmission systems and recasting the potentialities they represent in a context of democratic participation for community, national and global development in real time". IK manifest in the everyday life of indigenous people and they are used by people at the local level as the basis for decisions pertaining to all the vital activities including health, education, natural resource management, food security, conflict

management and it constitutes the social capital and main asset of people in the community (Lwoga et al 2011; Gorjestani 2000).

2.5 Indigenous Knowledge and Community Participation

IK cannot be effectively managed without involving the stakeholders from which the knowledge develops. Thus, community participation is one of the surest ways to advance the effective management of this knowledge system. The effects of community participation as demonstrated by Thorpe and Byrne (2016:18) "seeks to include more and stronger indigenous voices to reflect on past and contemporary indigenous experience and provide commentary on the material in the library's collections". One of the challenges with documenting IK is the problem of validation. Questions abound on objective validation in any given community without the bias of embellishment of information? Community engagement and partnership is thus an important factor to determine what is true from people's own experiences and way of living.

The need for community engagement is to aid in bringing all stakeholders together to streamline and come up with strategic ways to effectively manage IK. The stakeholders include the community who are the core owners of the knowledge system, information professionals who are the custodians of the information resources, governments who are in charge of policies, institutions including universities and NGOs who may be donor partners and provide IK resource centres and create spaces for IK research etc. The management of IK from the initial stage of the collection to its management and preservation cannot succeed without the full involvement of local communities. This according to Kargbo (2005) and Moahi (2012) is imperative for the survival and effective management of IK. Mhlongo (2018:66) asserts that the level and extent of community involvement relates to the issue of empowerment to make communities provide the relevant and appropriate information that affects their everyday life and way of living. The problem with validation of IK can be enhanced when there is partnership and owners of the knowledge are allowed to tell their own stories to avoid embellishment and inaccurate information. Thorpe and Bryne (2016:18) affirm that building relationships with communities ensures the inclusion of more

and stronger indigenous voices to reflect on past and contemporary indigenous experiences. More so, Myeza and Kaya (2016) add that community participation ensures that IK is collected, recorded and preserved and in the process, it shares knowledge, develops people's skills, creates job opportunities and empowers local communities.

2.6 Libraries, Information Professionals and Indigenous Knowledge Systems

Information professionals are the custodians of information. Hence, they have a key role to play in ensuring that IK is properly harnessed, processed and released (Chisenga 2002:4). Information professionals globally are trained and tasked with the responsibility of effectively managing information in a variety of forms and making them available and accessible to users according to their information needs. Information professionals have a decisive role to play in the management process through documentation, providing accessibility, ensuring dissemination and publicity to both indigenous and non-indigenous people whilst protecting it against exploitation and encouraging the acknowledgement of intellectual property rights (IFLA 2012). Ngulube (2002:99) points out that information professionals must be proactive in managing indigenous knowledge that is society's knowledge resources irrespective of its orality by laying down strategies for its effective management and use taking into consideration intellectual property to avoid its exploitation. Some of these strategies as outlined by Ngulube (2002:99) involves developing collection development policies taking into consideration the storage media, preparing inventories and registers for IK, developing standardized tools for indexing and cataloguing IK systems, compiling bibliographies of IK resources and making IK accessible to all through marketing strategies. Besides indigenous needs and concerns in terms of preserving community's knowledge for posterity are within libraries mandate (Maina 2012:16) and this is supported by Library and Information Science professional bodies such as IFLA (2012) and American Library Association, ALA (2010) who challenge libraries to manage and care for indigenous materials and resources using their skills and expertise in managing information resources.

In order to explore how IK is represented in libraries, Sandy and Bosaller (2017:131) identified that knowledge organisation systems (KOS) that most libraries use for organising information are closed and have the potential to limit ways of capturing IK. Hurley et al (2017:125) also add that finding the right people to articulate their genuine community stories is not the only the challenge but the classification schemes used by libraries appears not to have indigenous headings in the subjects and are basically westernised. By this, there is little, or no room created for themes and subject matter that reflects IK. Hence, there is incompatibility between indigenous knowledge organisational systems and ways of knowing that fall outside of these systems resulting in limitations both for materials and indigenous library users (Sandy & Bosaller 2017:130-131). The problem of classification thus puts the information professional in a dilemma because classification systems that are used in most parts of Africa are modelled on western systems.

In the effort to integrate IK into library's collection, the information professional is confronted with the issue of how to use subject classification systems to organise collections that are useful in indigenous contexts, how to ensure that the information collected is accurate to achieve quality and how to repackage IK and make it relevant to contemporary beneficiaries and to a larger extent, the global economy. In ensuring the accuracy of IK, Kostelecky (2017) outlines the problem of indigenous communities not telling their own stories leading to the embellishment of information because IK is mostly gathered and documented by people outside the indigenous communities hence knowledge provided may be more suitable to meet western opinions about indigenous communities. Relating to the opinions of Kostelecky et al (2017) and Hurley, Manus and Aguilar (2017), academic libraries as part of their community or social responsibility must be challenged to serve the indigenous communities they are sited while working towards their core mandate of supporting formal education. Reiterating the situation, Kostelecky et al (2017) emphasized that no institution is designed to actually meet the fundamental needs of local communities which needs an institution of higher learning locally, that will strategically understand their needs and work towards it. In representing indigenous realities in library's collections, Hurley et al (2017:124) raise the questions such as who has the moral right to share a community's IK, who is considered an authority over IK, and what are the ethical considerations when publishing cross-culturally.

These questions and issues are complex but need to be addressed to avoid infringement on intellectual property rights. This is one of the key considerations information professionals uphold in high esteem and advocate through their information literacy and outreach programmes.

Lwoga, Ngulube and Stilwell (2010) further emphasize that academic libraries over the years have not been particularly engaged in the collection and documentation of IK. Considering the value of IK if properly harnessed, information professionals from these institutions must be proactive and engaged in the drive to utilise and manage IK. This notwithstanding, Nkata and Langton (2005) admonish information professionals to maintain their thrust and engage communities in this endeavour. Information professionals as part of their social responsibility to the communities they serve as emphasized by Maina (2012:24) need to "witness and participate in the cultures that are part of the communities they serve" regardless of the type of library. By doing this, information professionals have a lot to learn to manage IK appropriately. Okore et al (2009) asserts that information professionals have promoted the exchange of information and have made significant progress in the management of local culture in different format thus libraries can and should be interested in partnering with communities to collect, document and preserve IK as an important source of developmental information.

2.7 The Mission, Scope and Focus of Universities and their Collections

Universities are established to provide higher education, undertake research, disseminate knowledge and foster relationships with the society and the outside world. In accordance with this mandate, the mission of universities defines their existence, purpose, what they hope to achieve, what they have to offer in terms of curricula, their focus and scope of operation. Thus, the mission of universities has a positive effect on the materials they acquire and stock in their libraries and is a determinant of whether the universities should consider all forms of knowledge as equally valuable and significant for teaching, learning and research. This is informed by the fact that every academic library's strategic goals are based on the overall goals of the universities to drive productivity and efficiency in academic pursuit and to affect socio-economic development of the

economies within which they operate. The scope and focus of academic libraries collections are technically based on programmes offered by the institutions. The need and purpose to push academic libraries to incorporate IK into their collection will be highly motivated by their curricula and their collection development policies. The responsibilities of collections development and management are tasked to librarians who ensure that they use their limited budget to satisfy the information needs of the various colleges, schools and departments within the university.

2.7.1 Collection Development Policies (CDP) of Universities

Collection development policies serve as a benchmark against which libraries measure the progress of their collection. It provides the criteria for inclusion and exclusion of materials in the library's collection. Johnson (2018:83) defines a collection development policy as a plan that guides the library's selection of materials, deselection and treatment of materials once acquired or obtained through contracts and licenses. IFLA (2008) further elaborate that collection development focuses on methodological and topical themes pertaining to acquisition of print and other analogue library materials (by purchase, exchange, gift, legal deposit) and licensing and purchase of electronic information resources. Thus, library's collection development according to Abioye and Oluwaniyi (2017) is meeting the information needs of users in a timely and economical manner using information resources locally held as well as from other organisations".

The CDP covers both the development and management of library's collection including the creation of policies to guide the selection of materials, planning for new collections, weeding, replacement of worn or lost materials and cooperative decision making with other libraries or within library consortia. These policies must, therefore, be frequently updated to meet the changing needs of universities as they expand and design new programmes in addition to existing ones. The collection development policies used in libraries do not accommodate indigenous knowledge because of its tacit nature. Mania (2012:17) elaborates that libraries focus on the management of knowledge that is generated by researchers and universities in a documented and codified forms.

This does not create room for indigenous representation and produces a closed system that limits the acquisition of IK.

2.7.2 Mission Statement, Programmes offered and Library Collection Development Policy of the Universities.

This section discusses the mission statement, programmes offered by the universities and the collection development policies of each public university.

2.7.2.1 University of Ghana (UG)

The mission of the University of Ghana is to "create an enabling environment that makes the University increasingly relevant to national and global development through cutting edge research as well as high quality teaching and learning". Thus, the university's focus is on intensifying research to contribute to national and global development. As part of its core values, UG is committed to knowledge generation that positively impacts the lives of those within and outside the university community. The programmes offered at the University of Ghana are in the health sciences, basic and applied sciences, humanities (arts and social sciences) and education. The University of Ghana has an institute for African studies that has a department for oral traditions and history. They also have a Department of Information Studies that specifically offers programs in information science (library and archival option).

The objective of the UG collection development policy is to provide and satisfy the information needs of the university community for the purposes of teaching, learning and research and to ensure that the collection is devoid of bias in any direction. The collection development policy of the University of Ghana states that the acquisition of materials should be of interest to their clientele (lecturers, students, researchers and administrative staff of the university). The library can also acquire any publication on Ghana including the speeches of all past heads of state, political party posters and manifestos and any other material to help researchers working on issues on Ghana.

The scope of the policy should cover areas and disciplines taught in the university and any other subjects relevant to the research, teaching and learning interests of the university. The library also collects and manage information in both print and non-print (CD-ROM, electronic resources, online databases, e-books etc.).

2.7.2.2 Kwame Nkrumah University of Science and Technology (KNUST)

The mission statement of KNUST is to provide an environment for teaching, research and entrepreneurship training in science and technology for the industrial and socio-economic development of Ghana, Africa and other nations. KNUST also offers services to communities, open to all people of Ghana and positioned to attract scholars, industrialist and entrepreneurs from Africa and other national communities. The core values of KNUST are diversity and equal opportunity for all. The programmes offered include sciences (biosciences, physical and computational science), engineering, agriculture and natural resources, art and built environment, health sciences, humanities and social sciences. The primary purpose of the KNUST collection development policy is to provide information resources in both print and electronic media necessary to carry out the university's teaching programmes and to support teaching, learning and research needs of its students and faculty. The collection includes books/monographs, journal/periodicals/annuals. Newspaper subscriptions, audio materials, video materials and software.

2.7.2.3 University of Cape Coast (UCC)

The mission of UCC is to create an equal opportunity university uniquely placed to provide quality education through the provision of comprehensive, liberal and professional programs that challenge learners to be creative, innovative and morally responsible citizens. The university constantly seeks alternative ways to respond to changing needs, offering a conducive environment that motivates the university to respond effectively to the developmental needs of a changing world. Programmes offered at UCC includes education studies, health and allied sciences, humanities and legal studies, agriculture and natural resources. The collection development policy

of the University of Cape Coast is to guide the library to acquire materials, manage their stock as well as preserve library materials to support curriculum.

2.7.2.4 University of Development Studies (UDS)

The mission of UDS is to promote equitable and socio-economic transformation of communities through practically oriented, community based, problem solving, gender sensitive and interactive research, teaching, learning and outreach activities by providing higher education, facilitating lifelong learning and developing ICT infrastructure as the driving force for education, improvement of efficiency and academic quality to advance community and national development. The programmes offered are health sciences, applied sciences, allied health sciences, integrated development studies, agribusiness and communication science, education, natural resources and environment, geoscience, agriculture, planning and land management. The collection development policy of UDS library is to build collections containing the materials in all formats (both print and non-print) that supports teaching and research programmes with primary emphasis on acquiring current materials to support the information and research needs of the university.

2.7.2.5 University of Professional Studies (UPSA)

The mission of UPSA is to produce employable graduates who can make a seamless transition into the workplace and be a valuable asset to any company. The programmes offered are accounting and finance, Information Technology and Communications Studies (ITCS), management studies, law and professional studies. The aim of the collection development policy of UPSA is to select, acquire, process and provide access to bibliographic, print and electronic information, knowledge and data needed by the university community for teaching, research, intellectual and creative activities and preserving recorded history and knowledge in areas unique to the university's role and mission. Collections include both print and electronic collections (e-books, e-journals, databases and CDs) available to students and faculty for research purposes.

2.7.2.6 University of Health and Allied Sciences (UHAS)

The mission of UHAS is to provide quality education, advance knowledge through scholarship and research that improves health and quality life driven by excellence, integrity, innovations, service and care. Programmes offered include health and allied health sciences (medicine, nursing/midwifery, pharmacy, public health, biomedical sciences). The collection development policy of UHAS is to guide the library to develop a balanced collection, taking into cognisance of the need of the wider spectrum of the academic and research community and acquire materials that support and enhance the curricula and research needs of UHAS. The types of materials selected include research materials, supplementary reading materials, various reference materials, periodicals and electronic resources.

2.7.2.7 University of Mines and Technology (UMAT)

The mission of UMAT is to provide higher education in mining, petroleum, technology and related discipline through effective teaching, and learning to promote knowledge through active research and dissemination of information and to offer professional services through extension activities to the mining and allied industries. Their core values are knowledge, truth and excellence.

2.7.2.8 Ghana Institute of management and Public Administration (GIMPA)

The mission of GIMPA is to promote the development of managerial skills for persons employed in the public and private sectors and non-governmental organisation, promote the use of information technology as an essential tool to increase competitive advantage and enhance output for national development and to provide unbiased and dedicated advisory services to various arms of government and to enhance the capacity of sustainable development and management. Programmes offered are business, law, technology, public service and governance, liberal arts and social sciences.

2.7.2.9 University of Energy and Natural Resources (UENR)

The mission of UNER is to promote the development of human resources and skills required to solve critical energy and natural resources challenges of society and undertake interdisciplinary academic research, and outreach programmes in engineering, science, economics and environmental policy. The core values of the university are to establish partnership with stakeholders in skills and knowledge generation and application; promote innovation, creativity, freedom of thought and creative expression, and to promote conservation of energy and environment. Programmes offered include agriculture and technology, engineering, geosciences, natural resources and sciences.

2.7.2.10 University of Education, Winneba (UEW)

The mission of UEW is to train competent professional teachers for all levels of education as well as conduct research, disseminate knowledge and contribute to educational policy and development. Programmes offered include educational studies, creative arts, foreign languages, linguistics and communication studies, Ghanaian languages education, social science education, agriculture education, vocational education, technical education, business education and science education.

2.8 Knowledge Organisation Systems (KOS) in Libraries

Burtis (2004) contends that "modern library and information systems are oriented towards a western logic of information retrieval and access without consideration to the cultural context in which it was created". Hurley et al (2017) add that the problem of representing indigenous realities in the library and archival collections is stereotypical representations and classification schemes constructed from western worldview. Organising information for easy access and retrieval is not only about cataloguing, abstracting, indexing and classification but the drive towards the management of IK is to develop KOS in a cultural context that can be usable and accessible to the owners of the knowledge system as well. The Knowledge Organisation Systems (KOS) that most libraries rely on for organising information are closed and as stipulated by Sandy and Bosaller

(2017) these KOS have the potential to limit ways of thinking. They continue to explain that there are incompatibilities between traditional KOS and ways of knowing that fall outside of these systems creating limitations for both the materials and indigenous library users.

The dilemma of the information professional in creating content and space for indigenous collections is the problem of classification. The information professional is faced with the dilemma of identifying the classification scheme that is appropriate for classifying indigenous content which may fall outside of the schemes adopted by most institutions globally. Sandy and Bossaller (2017:133-134) in exploring how IK is represented to provide cognitively just subject access found out that the western library systems do not meet the needs of indigenous users and does not promote cognitive justice for them. They further mentioned that the KOS presently used are based on literary warrant derived from the vocabulary of subject language which leads to the marginalisation of certain cultures and does not support diversity. One must not lose sight of the fact that some tacit knowledge is difficult to make explicit because it is sometimes extremely difficult for the knower to explain. A critical example can be linked to IK on spirituality. Besides dominant KOS used in libraries are not adept at organising information about indigenous people in a meaningful way (Sandy & Bosaller 2017:135).

To examine and find out how IK can be centred in University's library collection, Kostelecky et al (2017) raised issues of subject classifications systems in libraries not useful in indigenous context and suggested libraries to developed classification systems that will embrace headings useful in the communities they are situated. Notwithstanding, how can libraries provide adequate services to indigenous communities whose stories are represented in library collections by translations written by and for academics outside their communities? Although these unanswered questions remain an issue, information professionals must still achieve quality and accuracy in the collection of IK. Thus, as suggested by Chisita (2011) libraries in their endeavour to be a part of the drive to effectively provide appropriate and useful indigenous content should collaborate with indigenous experts, opinion leaders and community elders for collaboration. In creating KOS for

indigenous collections, libraries, as argued by Okore (2009) are only creating social spaces for communities to learn from each other and again exercise their mandate as custodians of IK who are to manage, preserve and provide access to IK and not owners.

Unlike western knowledge that are grouped in classes according to subjects, Mania (2012:19) opined that traditional knowledge systems are holistic and connected to various aspects which cannot be explained and understood in seclusion. Moreover, the KOS that are commonly used in libraries globally such as Library of Congress Subject Headings (LCSH), Dewey Decimal Classification and the Online Computer Library Centre (OCLC) lack representation of alternative knowledge which represents the knowledge of indigenous communities.

2.9 Indigenous Knowledge System and Education

The educational system of Ghana is modelled after the western system of education which does not embrace indigenous knowledge. It is basically hegemonic, concentrate on western philosophies and ways of knowing which are sometimes difficult to assimilate in the Ghanaian context and does not exhibit practicality. Indigenous ways of learning and knowing have been excluded from modern education because university cultures and as opined by Appadurai (2006) is driven by the advancement of globalisation, new digital economies and neoliberalism which creates a vast contrast between the indigenous way of knowing and university education. As clearly stated by Marker (2017:8) there is "a homogenic force of invasion, surveillance and separateness that operated in the unequal relationship between universities and indigenous communities". Indigenous ways of learning emphasize on the connectedness of man to the environment and practicality of events unlike western ways of learning which are mostly based on theories and concepts that are sometimes hard to explain and understand. It is however clear that there are disparities between these two knowledge systems and in order to break through this, there is the need for a change management approach to a collaborative connectedness where both knowledge systems can be emerged where necessary and integrated into our educational system (Marker 2017). Countries such as Canada, Australia and South Africa are putting measures in place and

working towards integrating IK into their educational systems, however, one of the major challenges that are encountered in the process is the problem of validation of what is being told and as rightly explained by Marker (2017:2) even in universities that have accepted indigenous education, indigenous scholars are entangled in discussions of change regarding the methods to validate indigenous knowledge. There is, therefore, the need for a paradigm shift to a place of convergence where both knowledge systems can meet to create a better understanding of the world.

The starting point of integrating IK into the western educational system according to Dei (2000) is to "recognise that different knowledge can coexist to complement each other and also can be in conflict at the same time in that there is a continuity of cultural values from past experiences that help shape the present." Dhewa (2011:53) attest that IK can coexist meaningfully with modern science through documentation and translation. The recognition and acceptance of IK as a valuable form of knowledge subsequently calls for its integration into formal education. Dei (2000) categorically states that the focus of integration should be on higher education because they can facilitate the recognition and validation of IK as an educational tool. Mapesela (2004:316) raised the question of whether IK is understood well enough to be integrated into formal education? Again, which field of study should IK be categorised since it cuts across many disciplines?

In integrating IK into formal education, Mapesela (2004:324) suggest that since it is problematic to give IK space in modern science, IK could be acknowledged as history and this should be respected in the same way that history of nations and other cultural groups are respected, accepted and honoured today. Contrariwise, Ngulube et al (2015:147) opined that IK should be incorporated into Library and Information Science (LIS) Curricula because LIS focus on organising, preserving and disseminating information and knowledge resources irrespective of the format. Likewise, Chisita and Abdullahi (2010) "urged LIS educators to include IK in their curricula to prepare LIS students with the skills and knowledge to organise and integrate IK and western knowledge for the benefit of society because integration is another way of discreetly preserving IK". As stated by Mapesela (2004) IK could coexist with formal education and not necessarily integrating the two.

But Gough (n.d.) contends that integrating IK into formal education is the best way to preserve it. Confirming this Onyemaizu (2015) adds that the process of integration would reactivate intergenerational learning and engage local people to participate in curriculum development to enable schools act as agencies for transferring the culture of society from generation to generation. Consequently, IK can be preserved and effectively utilised in the societal development process.

Addressing the need for meaningful inclusion of IK into higher education, Pidgeon (2016:77) asserts that "higher education has the responsibility to indigenization, that is to empower indigenous self-determination, address decolonization and reconcile systemic and societal inequalities". Mekoa (2015:13) averred that universities can play a critical role in the development of IKS by establishing IKS centres within the university that will act and facilitate collaboration between tertiary institutions, NGOs, practitioners and IK holders working in the development and promotion of IK. In addition, one way of promoting IK in higher education is the establishment of IK centres in universities to conduct interdisciplinary research on IKS. However, the challenge of inclusion of IK in education is the competition with market-related disciplines. Mekoa (2015:18) explains that the education system especially higher education is compelled to meet the demands of the markets in terms of curriculum content and this makes it difficult to focus on the development of IK into their curriculum. Additionally, is the problem of funding. Mekoa (2015:18) stressed that most funders and donors fund disciplines that directly benefit them and so attention is shifted towards disciplines that focus on the scientific and technological needs of modern societies. Globalisation has also influenced national systems of education to meet the job requirements of multinational corporations. Notwithstanding, Magara (2015:37) contends that the integration of IK into education involves a capacity building strategy that mainstreams, strengthens and modify IK content in the existing ones by utilising prospects and environments that will promote the assimilation of IK. Reddy, de Beer and Peterson (2011) concludes that in integrating IK into education, it is important to identify which aspect of IK would contribute to the existing education system. They further recommend focusing on the life sciences where IK can be more practical and useful as alternative methods.

2.10 Indigenous Knowledge Systems and Sustainable Development

Knowledge systems can immensely contribute to development in Africa when various kinds of knowledge are fully utilised in decision making in the development process. Sarkhel (2016: 427), acknowledges that there has been conceded a global consensus on knowledge as the basic input to sustainable development. IK is an important component of global knowledge on development issues and provides a productive context for programmes designed to help communities. Thus, solutions are geared towards local settings and not alien to a community's way of life. Nyumba (2006:) emphasized that IK can be usefully applied in development projects because it is considered as the basis for self-sufficiency and self-determination, providing effective alternatives to western technologies.

Mascarenhas (2004:1) asserts that there is a strong relationship between knowledge and development which when capitalised can positively affect Africa's sustainable development. Thus, in considering present strategies for development, it is central for learning and research institutions, international organisations to prioritize knowledge generation and use (the use of both scientific and indigenous knowledge) for the flow of new opinions and products that enhances productivity and is critical to development. For developments to be sustainable in any community, it cannot be divorced of the nurturing processes of the said community. These nurturing processes are the culture of the community which encompasses their indigenous knowledge. On the larger global scale, Dhewa (2011:53) adds that whilst western knowledge enjoys significant attention and seen as valid, its limitations and assumptions prevent it from providing sustainable solutions to development challenges because of its "*conceptualisations*" which in most cases are not practical.

Sukula (2006:84) opined that IK is a national resource and play a very vital role in sustainable development because it is the basis for education, health care, agriculture, food preparation, environmental conservation amongst others which is people-driven science through their creativity, innovation and skills. In indigenous societies, IK is the basis of decision making and education encoded in societies culture. Not only that but Chisita (2011) asserts that IK is gradually

gaining ground globally and its constructive role in the formulation and implementation of sustainable development policies and projects has been recognised globally. It is worth noting that even the bans and restraints through taboos in most African communities on unsustainable use of certain species, plants, forest, and other ecological species to help to shape environmental ethics that are critical for sustainable development.

Through the World Bank Indigenous Knowledge for Development program, there has been an improvement in the use of IK in the development of local communities in most parts of Africa through the application of appropriate technologies which has foster empowerment and sustainability (World Bank n.d.). Tharakan (2015:366-367) outlines some of these developments in countries that have benefitted from the program. Zimbabwe, Tanzania and Uganda have succeeded in ensuring indispensable value for secured and sustainable food production in agriculture. Ghana has seen high levels of productivity in adopting and using organic farming practices through local agricultural traditions. In the field of alternative/traditional/herbal medicine, countries such as South Africa, Kenya, Ghana among others have seen tremendous improvement in the management of HIV/AIDs through indigenous medical practices. In Ethiopia, IKS has been validated to assist in the promotion of public health through traditional medicine and social insurance. Sudan has been successful in enhancing renewable energy resource development through IKS. In the area of conflict resolutions, Ghana has seen lots of engagement of traditional rulers and local leaders to resolve conflicts at both community and national level.

Through indigenous practices with appropriate technologies, most indigenous communities have seen development in agriculture, natural resource management, health, water, sanitation and even in the field of business (Small and Medium Scale Enterprises). Looking at these developments, Tharakan (2015:369) urges government and key stakeholders to focus on addressing the needs of societies in culture and context specific ways by providing intellectual, knowledge and technology resource base that is appropriate and sustainable. This can only be effective and achievable by

fully engaging local communities in the overall development efforts from conceptualization and planning stage itself (Tharakan 2015:867).

The history behind societies knowledge resources for sustainable development is measured against stakeholder participation, commitment, common concerns of communities, inter and intragenerational equity, justice, effects of current actions (short, medium or long term) and issues of cooperation (Eyong 2007:122-124). To protect endangered non-human species and the environment, for example indigenous people use taboos (prohibitions and restrictions). Chisita (2011:11) explains that taboos are critical in nurturing sustainable use of resources in African communities. These prohibitions and restrictions such as unsustainable use of certain species, rivers and other ecological species help shape environmental ethics that are critical for sustainable development.

Cooperation among developing countries to share knowledge and disseminate information as confirmed by Al-roubaie (2010:113) are among the varied factors that contribute to development. Most societies have become totally dependent on technology transfer and western scientific applications to the neglect of their IK which mostly results in unfavourable effects such as structural imbalance and environmental degradation (Al-roubaie 2010:114-120). Hence, the failure of most developmental projects in Africa emanates from the exclusion of communities environmental, social, cultural and economic landscape. Sustainable development goals can be achieved if economies harness their IK, adopt and modify western methods and technology transfer to suite local conditions thereby creating a balanced process that ensures inclusiveness, equity, fairness and justice.

2.11 Indigenous Knowledge and Intellectual Property Rights (IPR)

Burtis (2012) states that "the most successful IK initiatives so far are the ones that take the constraints of access, the eco-system and capacities of the resources (knowledge) of indigenous

people into consideration. IK, as identified and explained by Gorjestani (2000), is a key element of the social capital of the poor and constitutes their main asset in their efforts to gain control of their own lives. Thus, sustainable and cost-effective survival strategies should be promoted in the development process. Indigenous people have to make capital gains from their knowledge which is a strategic asset and contributes to their economic development. IFLA (2012) mandates libraries to encourage the recognition of intellectual property laws to ensure the proper protection and use of IK. However, IPR remains one of the biggest challenges in documenting, managing and preserving IK by information professionals because it is difficult to assign ownership to an individual, a community or group looking at the difficulty in locating the source of the knowledge especially where there are similarities in cultures (Maina 2012:18). Grenier (1998) define IPR as mechanisms that are used to protect inventions by individuals or industries and give them the exclusive monopoly over their inventions for a period of time.

In relation to intellectual property, IK will fall under intangible property. It is thus, crucial to first consider the four separate and distinct types of intangible property which are categorised by Hefter and Litowitz (n.d.) as patents, trademarks, copyrights and trade secrets. Anderson (2010) adds that questions of intellectual property rights involve copyright, patents, trademarks, designs and confidential information (trade secrets). Besen and Raskind (1991) clearly explain the distinctions as follows:

- Copyright protection is to uphold the economic and moral rights of the authors. It allows the right owners to deprive financial reward from the use of their work which may include but not limited to literary works, artistic works, architecture, technical drawings, databases, advertisement, computer programs etc. and also the right to monopolise the copying of a work or their use (WIPO n.d.; Correa 2000:7).
- Trademark protection prevents a second entrant from unfairly appropriating the value of a successful trademark, service mark or trade dress. Trademark signs distinguishes goods or services of one enterprise from another (WIPO n.d.)

- Trade secret protection rests on the commercial value of the matter to the applicant. Trade secrets are protected without any procedural formalities and the products unlike patents can be protected for an unlimited period of time (WIPO n.d.). Trade secrets are confidential business information which according to WIPO (n.d.) provides owners with a competitive advantage. Examples are manufacturing processes, sales and distribution methods, advertising strategies among others.

- Patent protection enables the patentee (patent holder) to exclude all others from making, selling or using the subject matter of a valid patent. Patents are exclusively granted for an invention, which is a product or a process that provides in general a new way of doing something or offers a new technical solution to a problem (WIPO n.d.).

Masango (2010:7) points out that in protecting IK it is of importance to note that not all forms of IK can be protected within Intellectual Property. In explaining this Masango (2010) further indicates that myths, traditional beliefs, superstition, stories and customs which do not command financial benefits cannot be protected within IP laws. The campaign for the protection of IK rest on IK that embrace financial incentives, and these include the use of specific plants, identification of medicinal properties in plants and harvesting practices. However, the challenge remains that most indigenous communities, especially in Ghana, have very little knowledge on protecting their knowledge from overexploitation and according to Sraku-Lartey, Acquah, Samar and Djagbletey (2017:194) this has affected co-operation between indigenous communities and indigenous researchers on any research endeavour, mainly on biodiversity. Anderson (2010) address that despite global acceptance of IK in recent times, there is no international consensus about how indigenous people's rights can be secured legally, promoted ethically and used resourcefully by legislation or policy frameworks. A study conducted in Ghana by Sraku-Lartey et al (2017:194) revealed that there is no legislation developed to protect IK.

The relationship between IK and intellectual property laws is a contemporary legal problem. Questions around IK protection present issues unlike any other intellectual property law subjects

have had to take into consideration (Anderson 2010). Some of the issues raised are not always legal or commercial in nature. These are ethical, cultural, historical, political, religious/spiritual and moral dimensions of IK. Intellectual property law (IPL) promotes particular cultural interpretations of knowledge, ownership, authorship, private property and monopoly privilege. Thus, IPL places IK in the public domain and the rights can protect IK only to some extent (Wendland 2007). Janke (2005:96) concurs and acknowledges that copyright laws do not cover all the types of rights indigenous people want for their IK and further explains that IPL actually allows for the plundering of IK by providing monopoly property rights to those who record or transcribe the knowledge in a material form or patent it.

The difficulty with IK and protection is ascertaining where an IK originated and where the IK is shared by a number of various indigenous groups, making it difficult for an individual to claim ownership. Sithole (2007:122) points out that the inadequacies in many property rights instruments to appreciate the communal nature of IK and the focus on the economic value of information have failed to protect IK. Hence, the communality of the knowledge and the fact that it is oral, not written or recorded presents a challenge. Indigenous knowledge and intellectual property laws is an ongoing legal problem. Anderson (2010) opined that questions around IK protection present subjects dissimilar to any other that intellectual property law has had to deal with. Question of IPR involves patents, trademarks, copyrights, confidential information among others. Some of the issues raised by indigenous communities and researchers including ethical, cultural, historical, religious/spiritual, political and moral dimensions are not always legal or commercial in nature. Likewise, Anderson (2010) again points out that intellectual property laws promote a particular cultural interpretation of knowledge, ownership, authorship, private property and monopoly privileges.

Irrespective of these difficulties the Economic Commission of African (ECA) has recommended the recognition of IPR in using IK. Nel (2005:2) highlights the focus on recognition and extension of IPR to include community rights to intellectual property. In support of this recognition, Goduka

(2012) express the need for the recognition of IPR to include community right which will benefit a whole community and create a productive environment for innovative thinking. The need for the protection of IK has become necessary in recent times because people and organisations outside the indigenous communities especially the food, pharmaceutical and medicine industries are making financial gains out of this knowledge. Research conducted by Hoppers (2002:3) revealed that the drugs industries are using IK for the profit of a few without a share to the communities from whom this knowledge was collected from through research. Sahai (2002) also confirms that western science is using IK as a new source for drug without acknowledging its economic value and ownership to indigenous communities. Researchers and industries thus are making huge financial benefits from the use of IK and as suggested by Simone (2004) it has become necessary to protect IK because communities that own the knowledge have the right to receive the accrued benefits from what they have developed over time be it financial or recognition. Communities have to benefit from their knowledge which is their strategic asset for their development.

2.12 Management of Indigenous Knowledge

The tacit nature of IK makes it difficult for it to be effectively managed and validated to the level of scientific knowledge. Managing IK requires strategies geared towards collecting, documenting, codifying, disseminating and preserving it for use whiles ensuring that the communities who are custodians of such knowledge benefits from their intellectual property. Ngulube (2003:24) affirms that the key to the successful management of IK is "encoding IK into information" through codification and documentation as advocated by Ellen and Harris (2000:16). This implies that there are ways and means to transfer tacit knowledge which is the very nature of IK to explicit knowledge which is more western or scientific in general terms and vice versa.

In ensuring that IK is managed as other forms of knowledge, the information professional is faced with the challenge of who to collect these knowledge systems, the tools needed for collection and the willingness of communities to share their knowledge systems with others. In overcoming these major constraints, Ngulube (2003) explicitly explained that through the processes of socialisation, externalisation, combination and internalization, the SECI model proposed by Nonaka and

Takeuchi (1995) for knowledge management in organisations, tacit knowledge (IK) can be converted into explicit knowledge using appropriate tools (recorders, videos, databases etc) to collect, codify and subsequently preserve it for future generations (*NB:* this is explained in the conceptual framework above). Thus, a society's music, dance, folklores, storytelling and artefacts are ways of telling their stories and exhibiting their way of life and cultural presence. Through codification, documentation and preservation using appropriate technologies such knowledge could never go extinct but live on through generations to preserve their culture for sustainability.

2.13 Information Communication Technologies (ICTs) and Indigenous Knowledge Systems

The most effective way of communicating and sharing knowledge to the world is through the world wide web. For the voices of Africans to be heard and their opinions incorporated into the global knowledge system is by packaging their knowledge systems and disseminating it on a wider platform (that is the web). Although issues of internet connectivity and accessibility may be a major hindrance in achieving this goal, it should not prevent Africans from gradually following these trends. Chisenga (2002:3) opined that for the web to be relevant to African's information needs, culture and environment, it must contain appropriate information content from Africa, and this must be done by Africans themselves. This information must thus portray the true reflection of the indigeneity of Africa. In reflection, African's must tell their own stories to the world and so must be fully involved in the whole process of documentation, codification, management and preservation of IK in forms that are appropriate, compatible with current technology (to avoid technological obsolescence) and accessible globally through the internet.

One keyway to disseminate IK to the global community is the use of ICTs to capture, store, disseminate and preserve it. Dhewa (2011:54) narrates that the influx of technology offers indigenous communities the chance to invigorate IK through creativity and innovation. Creating databases that contain IK will make such information easily available, accessible, retrievable and easy to disseminate on the global information infrastructure (Chisenga 2002:18). With the use of

ICTs, IK can be documented in both conventional (print) and unconventional format (audio, video and other forms).

As part of ICTs initiative to facilitate access and sharing of information in developing economies, communication information centres (CIC) referred to as telecentres should be involved in the collection, processing, storage and dissemination of IK (Chisenga 2002:19). CIC is established to serve as internet facilities in rural areas that provide ready access to information needed by users with the aim of narrowing the digital divide (GIFEC 2013). These centres are established by development partners such as UNDP, GIFEC, World Bank, UN and NGOs in consultation with governments of the developing countries to provide ICTs for development. The centres can be major stakeholders in using their facilities to assist the collection and documentation of IK through collaboration to serve the information requirement of the communities they are sited. However, Ayoung, Kahefi and Abbott (2015) observed that the CIC has not achieved the objectives under which it was established, leading to the close down and underutilization of such facilities in the northern part of Ghana. They further stated that this problem is attributed to hegemony because most of these developmental agencies indirectly control beneficiary countries through their dominant ideologies. The ideologies are embedded in whatever aid they offer to underprivileged countries and thus most of the technologies provided through such programmes were divorced of the beneficiary country's local context including cultural, historical and institutional situation (Heeks 2002; Chaudhuri 2012)

Academic universities have the necessary ICT infrastructure to document and servers to host IK databases. Most universities in Ghana are now embarking on digitisation projects and thus have facilities that can also be diverted to documenting IK within the communities they serve.

The trend in global communication and information networking is aided by ICTs in the current era of the information age and offers global access to information transfer, use and access across nations. Chikonzo (2006:134) explains the transformative effect of ICTs on the economic, social

and cultural settings and concluded that if properly utilized, ICTs can be used to preserve IK by digital library and internet-based archive to disseminate Africa's IK. A good example is the Indian digital library of traditional knowledge (also indigenous knowledge) which contains information on various Indian traditional medicine and also contains international standards registries of traditional knowledge. Chikonzo (2006) further suggest that other countries can follow the Indian standard and develop their own digital library for collecting, preserving and documenting IK.

Tjiek (2006:124) demonstrates that digital libraries in the form of institutional repositories can be used by universities to identify, collect, digitise, catalogue, and disseminate IK. The Information Village (Desa Informasi) initiative as further discussed was an initiative used by the Petra Christian University in Indonesia to show local content and advocate the use of IK as a learning resource and increase its visibility. Tjiek (2006) adds that digital libraries have enlarged the scope and access to digitised resources because it holds great potentials to contribute to the preservation and dissemination of IK. Burtis (2012) illustrates how ICTs can be used to disseminate IK as follows:

1. ICTs can be used to capture, store and disseminate IK so that it can be preserved by creating accessible IK information systems.
2. ICTs can be used to promote integration of IK into formal and non-formal training and education by proving a platform for advocating for improved benefit from IK systems through cost effective dissemination of IK.
3. ICTs can facilitate and provide a platform for advocating for improved benefit from IK systems of indigenes.

Proper application of ICTs according to Adam (2012) will incite the flow of IK and incorporation of modern scientific and technological understandings to IK because IK represents an important component of global knowledge which is used for local level decision making in communities.

2.14 Challenges to Managing Indigenous Knowledge

Various challenges hinder the development, management and incorporation of indigenous knowledge into other knowledge systems. Most fundamental is the neglect of indigenous knowledge by people who can drive the move for its total acceptance into the global body of knowledge and as explained by Mascarenhas (2004:3) scholars, decision-makers and politicians have all neglected this rich knowledge system and thus it has vastly been under-utilised. Conversely, the lack of indigenous people with advanced indigenous expertise and western research experience to bring balance to the indigenous knowledge enterprise remains a challenge (Barnhardt & Kawagley 2005).

It is critical to understand that in making every little attempt to manage IK by stakeholders involved, Chisenga (2002:18) points out that "not all types of IK can be easily managed, and it is henceforth important to concentrate efforts on best practices of IK towards innovation and sustainable development." Rouse (1999) observed that certain practices and set of beliefs outside a particular community cannot be captured in the logic standard that is required and is seen as groundless based on accepted standards globally. An example is female genital mutilation in most parts of Africa which by all standards globally is an unacceptable practice and the theory and explanation behind such practices is unfounded.

Chisenga (2002:3) opined that IKS is threatened by modernization, urbanization and globalisation and are at the verge of becoming extinct due to the lack of documentation. This problem arises from the fact that IK is tacit in nature, communicated orally and rest in the minds of the people who use it. The challenges to the marginalisation of IK in most settings are information accessibility, intellectual property, motivation, funding, skills and expertise (Olaide & Omolere 2013). In explaining information accessibility as a challenge, Opeke (2000) argued that information and human mental creativity are the sources of wealth and power as compared to physical resources. Afolabi (2003) concurred that information is a valuable asset for social,

industrial, technological and political advancement. All these benefits have not been fully capitalised because IK is mostly considered unempirical.

Again, the educational systems in most developing countries have not incorporated IK as a subject in their curriculum. IK is virtually disconnected from the educational and learning system in most parts of the world especially in Africa, Ghana to be precise. Even institutions that offer Information Science programmes do not have modules for the management of IK. Funding is also a major challenge to the management of IK. The question of who bears the cost involved in collecting, documenting and using ICTs facilities to disseminate IK. Chikonzo (2006) stated inadequate funding for organizations dealing with information and libraries by governments makes it difficult for African countries to effectively harness ICTs (computer hardware and software, scanners, high cost of internet connectivity and other equipment for digitisation) for collecting, preserving and disseminating IK. Lack of proper training on the use of ICTs also poses a challenge to the effective management of IK.

Sharing IK among communities and cultures because of its tacit nature and non-documentation is another challenge (United Nations 2006). Where it is documented, the issue of ownership poses a great disadvantage to indigenous communities, especially where it involves financial benefits. Sahai (2002) raised concerns that IK has been used by most commercial enterprises and researchers without any compensation to the owners of the knowledge. Conclusively, IK is not connected among various sectors of the economy including academic institutions, private and public sectors and grassroot innovators (Al-roubaie 2010:126). It is isolated and not well integrated into the global knowledge system. Thus, it does not foster global competitiveness.

2.15 Summary
In making every effort needed to codify, document and preserve IK, it should be noted that not all types of IK can be easily captured and documented. It is imperative for Information professionals

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to ensure that the documentation of IK is done in consultation with communities to document best practices of their culture that can be transferred across borders. Therefore, in the context of academic libraries, librarians should have a scope in terms of collection and be guided by the university's curriculum. Thus, indigenous information on agriculture, medicine, performing arts, linguistics, natural resource management amongst others which contributes immensely to sustainable development and other developmental agendas should be considered. Libraries are the block of local information and knowledge infrastructure and regardless of the type of library, they must in a way serve the communities within which they are situated (Mahwasane 2017; Sarkhel 2016:431; Okore et al 2009:4).

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 INTRODUCTION

The purpose of this chapter is to outline the research methodology that guided the study. Research is conducted with the purpose of exploring a new topic (exploratory), describing social phenomenon (descriptive) and to explain why something happens (explanatory). Studies may have multiple purposes, but one purpose is usually dominant (Newman 2014:38). These reasons require conceptualizing research problems and unfolding the phenomenon that is being investigated using an appropriate research methodology which primarily emanates from the knowledge that is produced in any scientific field and forms the basis of the research process (Ngulube 2015:125). The aim of every research is to investigate questions, enquire into phenomenon and explores issues. This according to Clough and Nutbrown (2012:4) delves into asking questions, exploring problems and reflecting on what emerges in order to make meaning from the data and tell the research story. The research story must be situated within a paradigm (foundational assumptions); methodology/method (quantitative, qualitative or mixed methods research); approach/strategy (survey, case study, experimentation, convergent, explanatory, content analysis etc.); research methods/techniques (questionnaires, interviews, observations, artefact analysis) (Ngulube 2019:88). In situating the research story, Ngulube (2015:126) opined that knowledge that is produced in any scientific field depends on the methodology that is used. The strength, validity, integrity and authenticity of a research study is dependent on the methodology that is deployed for the study and how they are justified. The methodology hence shows how research questions are articulated with questions asked in the field and its effect is a claim about significance (Clough & Nutbrown 2012:25).

Research methodology allows researchers to devise suitable procedures to organise data to achieve the goals of a study. To emphasize, it covers the research design which deals with the population of the study, sampling techniques, sample size, instrumentation, mode of data collection, data analysis, problems encountered through the procedures, and ethical considerations (Asamoah 2013:77). The type of methodology adopted by a researcher is dependent on the problems being

investigated and the pertinent method that will be applicable to the situation (Kumekpor 2002:99). Notwithstanding, there are some misconceptions on the use of concepts in research methodology. Most early career researchers are sometimes confused about which research methodology might seem appropriate in their area of study. By this, Ngulube (2015, 2019) opined that many researchers have difficulty in identifying the conceptual differences between epistemology, ontology, paradigm, methodology, research approaches, techniques and other core concepts in research methods. Much of the confusion is attributable to failure to clearly distinguish between research approaches, designs and methods. The appropriateness and applicability of a methodology varies from one subject or discipline area to the other. Researchers must therefore study the trends in their field or explore methodologies in other fields, test it in order to decide what they deem useful.

To make clarifications on the growing body of knowledge, this chapter will critically explain the distinctions and applicability of these concepts throughout the study.

Figure 3.1 Framework for Research Methodology
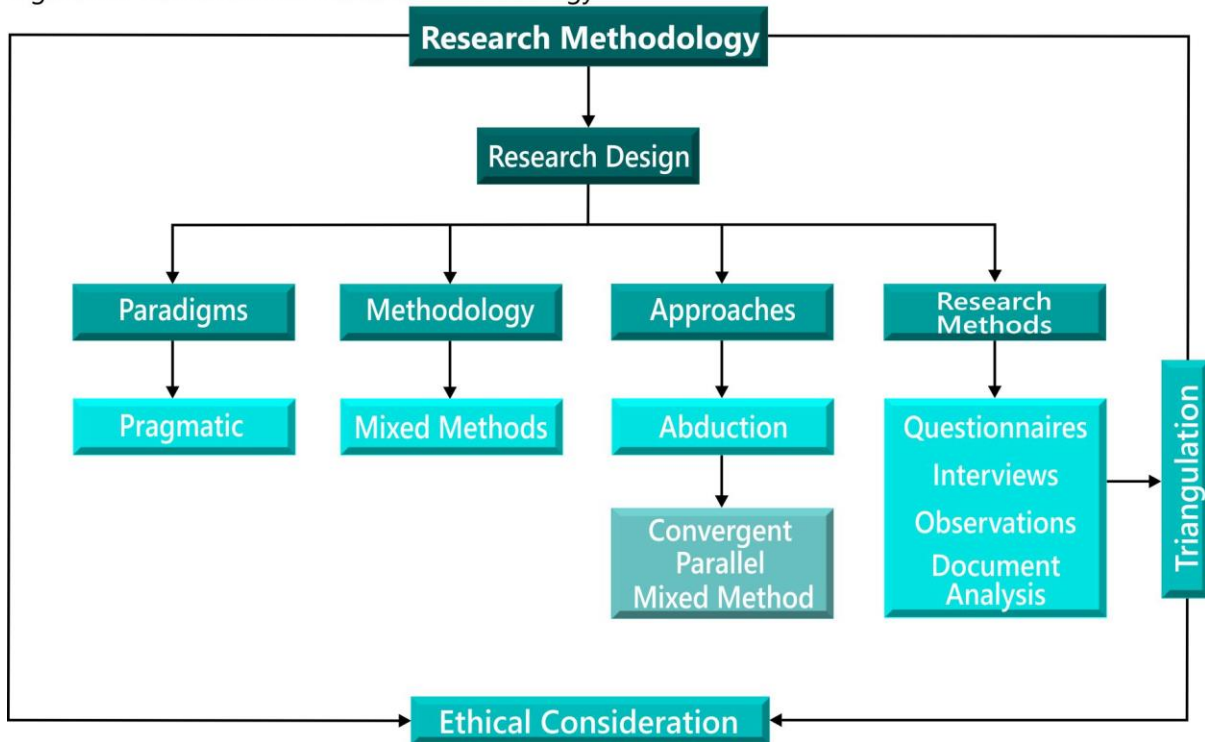
Figure 3.1: Framework for the research methodology

Source: Synthesis from the Literature (2019)

3.2 RESEARCH DESIGN

A research design entails the whole structure of the study and the plan implemented for data collection to achieve the research objectives. The research design according to Ngulube (2019:87) holds the entire research project together without which will render the research flawed and full of methodological errors. Thus, the plans and procedures that span through data collection and analysis and according to Creswell (2009:87-115), the choice of a research design are based on the focus of the research, issues that are being investigated, the researcher's interest and personal experiences as well as target participants for a study. The research design is basically the general plan for answering the research questions (Saunders et al 2012:159) to ensure that evidence obtained enables answers to the initial question as explicitly as possible (De Vaus 2012:9). Singleton and Straits (2010:109-111) outline the elements of research design to include:

1. Formulation of the research question which is the beginning of the research.
2. Preparation of the research design which entails the overall plan or framework for the investigation.
3. Measurement which involves devising operations that will link specific concepts to empirically observable events.
4. Sampling which involves how many units should be selected and how to go about choosing them.
5. Data collection, which is dependent on experiment, survey, field research and use of available data. This affects decisions about measurement and sampling.
6. Data processing which involves analyzing and interpreting the data collected.
7. Data analysis and interpretation which involves manipulating the data so that their meaning and bearing on the research problems and hypotheses that initiated the inquiry can be extracted.

Adopting the research design landscape explained by Ngulube (2019:88), covers the foundational assumptions (paradigms), the methodology, the research approach and the research methods. To objective of the study, the mixed method design was adopted for this study based on the convergent parallel mixed method (CPMM) using survey.

The use of the mixed method design enabled the researcher to use different approaches in one study to achieve the research objective. The use of this design also helped respondents to answer questions that were peculiar to their group using different research methods to solicit for information relevant to the research question. The design again helped the researcher to collect and merge both qualitative and quantitative data to produce a comprehensive analysis of the research problem.

3.3 RESEARCH PARADIGM

Researchers have varied opinions on what influence their beliefs and decisions on social realities. These opinions entail the plan on how to get answers to the research problem known as paradigm, philosophy or worldview. The foundations on which social research is framed according to

Ngulube (2015:127) are "the philosophical assumptions about the nature of knowledge, or the nature and existence of social reality (ontology) and what constitute that knowledge and ways of knowing (epistemology) make up a paradigmatic base of research in a subject field". Plano Clark and Ivankova (2016: 55) expound research paradigm as the collection of assumptions and values about the nature of reality and knowledge that provides the foundation for a research study. Morgan (2007:49-50) posits that paradigms are shared belief systems that influence the kinds of knowledge researchers seek and how they interpret the evidence they collect. He further grouped four versions of the concept of paradigms and asserted that they have different levels of generality which are:

1. Paradigms as worldviews encompassing perspectives on the world.
2. Paradigms as epistemologies incorporating ideas from the philosophy of science such as ontology (nature of reality), methodology (approaches to kinds and paradigms of research) and epistemology (what is considered acceptable knowledge).
3. Paradigms as the best or typical solutions to problems.
4. Paradigms as shared beliefs of a research field which involves community of practice or scholars.

From these categorizations, it is clear that paradigms influence the research questions that will be asked by researchers based on the problem under study and the methods that will be used to answer them. It is important to note that situating a study within a paradigm is key because it influences the research methodology, the purpose of the study and the research question (Ngulube 2015:128). As part of academic research requirements, researchers are required to position their research within a specific paradigm to serve as a guide throughout the research journey (Morgan 2007: 49). There are various research paradigms, philosophies or worldviews which are categorized as positivism, realism, interpretivism, and pragmatism (Saunders, Lewis and Thornhill:128; Creswell 2014:35; Ngulube 2015:128). The choice of a research paradigm corresponds to the methodology adopted by a researcher. Ngulube (2014:35) illustrates that realism and positivism represent quantitative research, constructivism or interpretivism corresponds to qualitative research whilst pluralism or pragmatism maps mixed methods research.

For the purposes of this study, the pragmatic paradigm was used. This paradigm as justified by Creswell (2014:40) "allows different worldview, multiple methods coupled with different methods and procedure for data collection and analysis". Using both qualitative and quantitative approaches gives a complete and a more comprehensive understanding of the research problem, of which applying one approach alone may be deficient (Creswell 2014:35-36; Creswell 2009:87-115). By pragmatism, researchers "recognize that there are many different ways of interpreting the world and undertaking research, that no single point of view can give the entire picture and that may need multiple realities" (Saunders et al 2012:130). Pragmatism is not bound to any one system of philosophy and reality but draws substantially from both quantitative and qualitative assumptions and applies overtly to mixed methods research (Creswell 2014:39). It gives the researcher a leverage to choose multiple methods, different paradigms, and make different assumptions as well as collect different kinds of data to make analysis from various perspectives that best suits the topic under study. More importantly as concluded by Shannon-Baker (2016: 331), pragmatism offers a strong emphasis on research questions, communication, and shared meaning-making. In addition, he explains that "in connecting theory to data, pragmatism uses abduction which is useful during the integration stage of mixed methods, recommends a balance between subjectivity and objectivity" and accentuates on transferability throughout the research.

3.4 MIXED METHODS RESEARCH (MMR)

Mixed methods research is the methodology that spans throughout the study. It combines the strengths of the qualitative and quantitative methodology to produce a comprehensive and broad-based research (Ngulube 2015:127). Mixed methods research is hybrid combination of elements of qualitative and quantitative viewpoints, data collection, analysis and inference techniques in a single study (Molina-Azorin 2012:33; Creswell & Plano Clark 2011:5; Tashakkori & Teddlie 2010:711; Edmondson & McManus 2007:1155; Johnson, Onwuegbuzie & Turner 2007: 123). In conducting a research study, researchers must be able to react to the needs and interest of distinct elements of their population and non-other than a mixed method research offers this opportunity. Despite the criticism on the use of mixed methods due to the difficulty in undertaking qualitative and quantitative methods concurrently or sequentially in terms of time and resources to undertake

distinct stages of a study as identified by Johnson & Onwuegbuzie (2004) and Ivankova, Creswell and Stick (2006). Mixed methods research clearly explained by Greene (2005:209) and Doyle, Brady and Byrne (2009:183-184) offers greater possibilities for responding to the agenda of decision-makers as well as to the interests of other legitimate stakeholders.

The main purpose of mixed methods research according to Denscombe (2008:272) is to:

1. Produce a more comprehensive picture by combining information from complementary kinds of data sources to improve the accuracy of data.

2. Avoid biases intrinsic to single method approach in order to compensate for specific strength and weaknesses associated with a particular method.

3. Develop the analysis and building on initial findings using contrasting kinds of data or methods.

3.4.1 Mixed Methods Design

Tashakkori and Creswell (2007:4) define mixed methods design as a "research in which the investigator collects and analyses data, integrates the finding and draws inferences using both qualitative and quantitative approaches or methods in a single study." Creswell (2009:87-115) explains that "using mixed methods is more than simply collecting and analyzing both kinds of data but it also requires the use of both approaches in combination so that the general strength of the study is greater than either qualitative or quantitative research". Creswell and Plano Clark (2011:5) outlined six prototypical types of mixed methods research design to include convergent (concurrent qualitative and quantitative), embedded design (collection of supporting data), explanatory design (quantitative followed by qualitative), exploratory design (qualitative followed by quantitative), transformative design (design that specifically advance the needs of underrepresented or marginalised populations) and multiphasic (combining other approaches over multiple phases). Punch (2012:295-297), Creswell and Plano Clark (2007), enumerate four types of mixed methods research as triangulation design, embedded design, explanatory design and exploratory design. Creswell (2014:44) also lists four types of mixed methods design as convergent parallel mixed methods, explanatory sequential mixed methods, exploratory sequential mixed methods and transformative mixed methods (embedded mixed methods or multiphase

mixed methods). Ngulube (2015:128) in mapping the research methodology discourse outlined three types of mixed methods design to include exploratory, explanatory and embedded design. Triangulation as a type of design was rather grouped under research techniques and methods and currently referred to as the convergent design.

Triangulation design is to "obtain complementary quantitative and qualitative data on the same topic, bringing together the different strength of the two methods and both methods are given equal weight" (Punch 2012:296; Creswell & Plano Clark 2007:62-64). Embedded design is where one data set plays a supportive secondary role in a study based primarily on the other data set (Punch 2012:296; Creswell & Plano Clark 2007:67-71). The explanatory design is where the researcher uses qualitative data to help explain or build upon initial quantitative results and the exploratory design is where qualitative data is collected in the first instance and quantitative data is collected in the second instance (Punch 2012:296; Creswell & Plano Clark 2007:67-75). According to Creswell (2014:44), the convergent parallel mixed methods (CPMM) helps the researcher to converge or merge quantitative and qualitative data in order to provide a comprehensive analysis of the research problem. With this type of mixed method design, the researcher typically collects both forms of data at roughly the same time and then integrates the information in the interpretation of the overall results. Creswell (2014) adds that any contradictions or incongruent findings are explained or further probed in the design. To provide a comprehensive analysis of the research problem, the researcher used the convergent parallel mixed methods design. The choice of the CPMM over others enabled the researcher to use different instruments to collect and analyse data to achieve the objectives of the study.

3.5 MMR RESEARCH APPROACHES

The choice of a research approach is dependent on the nature of the research problem under investigation, the personal experiences of the researcher and the audiences for the study (Creswell 2014:31). With reference to the research design landscape, Ngulube (2019:88) illustrates the research approach/strategy in mixed methods research as exploratory, explanatory, embedded and convergent which are the procedures used to conduct a study. Creswell (2014:31) describes

research approach as the plan and procedure that consist of the steps of broad assumptions to detailed method of data collection, analysis and interpretation. The research approach serves as a plan for the researcher to get answers to the research problem. Saunders *et al* (2012:143-144) discussed research approaches as deductive (generalizing from the general to the specific and theory falsification or verification), inductive (generalizing from specific to general and theory generation or building) or abductive (generalizing from the interactions between the specific and general and incorporating existing theory where appropriate, to build new theory or modify existing theory). Research can be approached as quantitative research (an approach for testing objective theories by examining the relationship among variables), qualitative research (an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem) and mixed methods research (an approach to inquiry involving both quantitative and qualitative data, integrating the two forms of data and using distinct designs that may involve philosophical assumptions and theoretical frameworks) (Creswell 2014:32). Thus, quantitative research is linked to deductive reasoning while qualitative research is linked to inductive reasoning and mixed methods research is linked to abductive reasoning` (Morgan 2007:71; Wheeldon 2010:89; Saunders et al. 2012:144). For the purposes of this study, the mixed methods approach using abductive reasoning was used throughout the study.

3.6 RESEARCH METHODS

Researchers need a guideline to help conduct their research project. These guidelines are commonly referred to as research methods. Research methods are basically the mode of data collection. Enhancing the validity and reliability of a study requires the use of appropriate research methods which as explained by Ngulube (2015:125) are essential to conceptualize research problems and describe the phenomenon that is being studied. Research methods are procedures or techniques used to implement the sampling, data collection or data analysis steps within a research study (Plano Clark & Ivankova 2016: 57). Cohen, Manion and Morrison (2007:47) add that methods are a range of approaches used to gather data which are to be used as a basis for inference and interpretation, for explanation and predictions. Hence, the methods are frameworks for a research project. Research methods are essentially the tools and techniques that are used by

researchers to collect data for the research study. These methods, techniques or procedures to collect and analyse data includes interviews, observations, questionnaires, document review and analysis among others. The type of data collected is either qualitative data or quantitative data. Qualitative data are collected through interviews, observations or document review and analysis or image-based (pictures, videos, brain imagery) whiles quantitative data are collected through numeric representation of concepts such as survey scores, financial reports, ranking or evaluation (Gibson 2017:195). For a more holistic understanding of the issues under study, the researcher used triangulation. Using more than one method (interview, survey, observation) to approach a research question to minimize the risk of error and bias, improves validity and credibility of research and allow the dismissal of rival alternative explanations of prepositions and conclusions (Skott & Ward 2013:138; Mathison 2005). Triangulation was used throughout the entire research from data collection, theories, and methodology in order to help align multiple perspectives and give a broad discernment of the phenomenon of interest (Hastings 2010). These data collection techniques span through questionnaires, interviews, observations, reviews of documents among others (Creswell 2014:91, 230; Ngulube 2015:137).

Understanding social phenomenon and addressing the challenges that come with it involves critically investigating the issues from different perspectives which form the premise of triangulation. Social researchers build on the principle of learning from multiple perspectives rather than a single perspective and according to Newman (2013:171), they employ the process of triangulation. Triangulation is the use of different research methods or sources of data (quantitative and qualitative) in a single study to improve on the validity and reliability of a study to achieve completeness (Singleton & Straits 2010:432; Bryman 2012:717; Babbie 2007:113; Ngulube 2015:129). Ngulube (2015:137) attest that triangulation is one of the ways of enhancing rigour and trustworthiness in qualitative studies and the validity and reliability of quantitative studies. By combining the strength of trustworthiness in qualitative methods and the validity and reliability of quantitative studies, researchers are assured of quality research outcomes. The intriguing aspect to the use of triangulation as opined by Singleton and Straits (2010:432) is the use of dissimilar methods or measures which does not share the same methodological weaknesses (errors or biases)

to intensify the chances of solving the research problem. Triangulation can be used at different phases of the research cycle which include triangulation of measure, triangulation of theory, triangulation of methods or methodological triangulation, triangulation of observers (Turner, Cardinal & Burton 2017:245; Neuman 2013:167). Turner et al (2017:244) elaborate that most mixed methods focus on triangulation that spans multiple methodologies. Besides, the purpose of mixed methods is triangulation by seeking convergence, corroboration, integration, completeness, and validation of results (Creswell & Plano Clark, 2011; Molina-Azorin 2012: 35; Mertens & Hesse-Biber 2012:75).

3.6.1 Study Area

The study was conducted across Ghana but confined to public universities because they are accountable to the government and to a larger extent the general public. The ten public universities studied covered nine regional capitals with the exception of the Eastern Region (because there is no public university), namely: Greater Accra, Ashanti Region, Central Region, Western Region, Northern Region (Upper East and Upper West), Volta Region, Brong Ahafo Region, and Western Region. The regions were categorized into three zones namely: Northern zone (Northern region, Upper East, Upper West, Ashanti region); Middle zone (Central Region, Western Region, Brong Ahafo Region) and Southern zone (Greater Accra region and Volta Region). Table 3.1 shows the universities grouped into the three zones.

Table 3.1 Zonal Divisions of Public Universities in Ghana

Zonal Divisions	Universities (Initials)
Northern Zone	KNUST, UDS, UENR
Middle Zone	UCC, UEW, UMAT
Southern Zone	UG, UPSA, GIMPA, UHAS

Source: Field Data (2019)

3.6.1.1 Zonal Divisions of Public Universities in Ghana

The universities have been grouped into three zones based on proximity of the regions as follows:

Northern Zone: The northern zone comprises Kwame Nkrumah University of Science and Technology (KUST) in the Ashanti Region and University of Development Studies (UDS) in the Northern region and Natural Resources (UENR) in the Brong Ahafo Region.

Middle Zone: The middle zone comprises of University of Cape Coast (UCC) in the Central Region, University of Education, Winneba (UEW) in the Central Region, University of Mines and Technology (UMAT) in the Western Region and University of Energy.

Southern Zone: The southern zone comprises of the University of Ghana (UG); the University of Professional Studies (UPSA); the Ghana Institute of Management and Professional Administration (GIMPA) all in the greater Accra Region and the University of Health and Allied Sciences (UHAS) in the Volta Region.

3.6.2 Population of the Study

A population is a set of elements a researcher is interested in studying to make certain deductions. Researchers seek knowledge or information about a whole class of similar objects or events usually large, who are the target group and full set of cases popularly identified as population (Saunders *et al* 2012:260; Punch 2012:359; Singleton & Straits 2010:150). These elements can be people, animals, objects, and events (Neuman 2006:219; Johnson & Christensen 2008:224). Based on the research questions and problem under study, researchers can easily identify the target population from which they would make an inquiry. Depending on the nature of the inquiry, researchers may use a population with similar, same or different characteristics to achieve the objective of the study. The population of the study comprises different categories of librarians in terms of rank or position who work in the libraries of the various universities. Based on the ranks and the different perspectives the researcher wants to gain in terms of policies and procedures of work, the population for the study was divided into three groups. First set was the University Librarians of all the Universities who were interviewed and represent top-level management (Directors of the

library). The second set was senior members who represented heads of units of various departments at the library (middle management) and the third constitutes senior and junior staff whose opinions were solicited through questionnaires. The second and third set of the population were drawn from acquisition, cataloguing, reference, Africana/special collection, and e-resources unit. Each unit had a senior member as the head of a unit and senior and/or junior staff who were involved in the daily routines of the units. There were 800 library staff from all the Universities. The population for the study is a homogenous population and are essentially alike in terms of functions and structure of routines.

3.6.2.1 Stratified Sampling

Neuman (2013:262) defines a stratified sampling as a "simple random sample in which the researcher first identifies a set of mutually exclusive and exhaustive categories (strata), divides the sampling frame by the categories and then uses random selection to select cases from each category." Saunders et al (2012:276) and Olsen (2012:27) elaborates that stratified sampling is a modification of random sampling in which a researcher divides the target population into two or more relevant and significant strata based on one or a number of attributes. They add that dividing the population into a series of relevant strata ensures that each stratum is represented proportionally within the researcher's sample. Stratified sampling helps researchers to divide the population into subgroups or strata so that each unit belongs to a single stratum to select units from those strata (Teddlie & Yu 2007:79). In most cases, researchers require different standpoints from the sample especially when they are distinct in terms of status or ranks within the same unit to be representative of the subgroups in the sample and to improve accuracy. Stratified sampling also helps to control the relative size of each stratum rather than letting random processes control it and produces samples that are more representative of the population (Neuman 2013:262; Lemme 2012:2; Daniel 2012:8). Stratified sampling positively affects the representation of the sample, improve precision, and reduce bias caused by nonresponse (Lemme 2012:4; Kalsbeek 2011:2). The population was divided into four strata. First strata are the University Librarians, second strata are the Heads of Units in each of the five units in the libraries (acquisition, cataloguing, reference, Africana collection and e-resources unit), the third strata are senior staff and the fourth strata are

Junior staff. The researcher selected all categories of staff to get varied perspective on the issues been investigated. All university librarians and all heads of the various units were included. For senior and junior staff, the proportional random stratified sampling was used to get the respondents. The use of proportional stratification for selecting senior and junior staff is to have the same distribution of staff in the two categories to understand their different opinions. The researcher's choice of a stratified sampling was dependent on the focus of the study and to be able to use different range of methods and procedures to get respondents from all the stratum who provided relevant information to achieve the objective of the study.

3.6.2.1.1 Sampling Procedures

According to Ngulube (2005:132), the suitability of the sampling strategy has an effect on the validity of the research results and must be clearly stated. For the knowledge gained to be representative of the total population under study, researchers need to be able to obtain data from a smaller group or subset of the total population, often known as a, sample (Cohen, Manion & Morrison 2007; Straits & Singleton 2011). Sampling provides a valid alternative to a census (using the entire population) when it would be unfeasible to survey the whole population due to budget and time constraints (Saunders et al. 2012:260; Olsen 2012:24) and to avoid getting the same responses from groups with very similar characteristics or routine of work. However, this is not always the case in most situations. Sometimes, researchers want to obtain more accurate and detailed information from respondents to give them more time and space to check the validity, reliability and trustworthiness of the responses if they do not satisfy the research objectives. Hence, a sample is needed to achieve such goals. In doing this, it is imperative to select a sample size that will be representative of the population. Plays (2008) indicates that the best sampling procedure depends on the context in which researchers are working and the nature of their research objectives. Oliver (2006:245) posits that the choice of a sampling strategy is dependent most likely on the detailed appropriate data respondents can provide in terms of relevance and depth to the research question. The sample size is dependent upon a researcher's budget and degree of confidence required. Notwithstanding, it is important to consider the total population of a study before selecting a sample size (Neuman 2011). Using Krejcie and Morgan (1970) table for determining a

sample, for a known population of 800, 260 is a recommended size. Because the population is homogenous in terms of functions and structure of activities, the researcher sampled using stratified sampling to select a sample size of 260. Below is an illustration of the sample for the study in Table3.2.

Table 3.2 Staff and Sample in each Stratum

Category of Staff	Sample in each Stratum	Percentage (%)
University Librarians	10	3.8
Heads of Units (Senior Members)	50	19.2
Senior Staff	100	38.5
Junior Staff	100	38.5
Total	260	100

Source: Field Data (2019)

3.6.3 Sources of Data

Researchers make use of both primary and secondary sources of data to gather information to complete their study. There are two major types of data which are primary and secondary data. Secondary data includes both raw data and published summaries including quantitative (numeric) and qualitative (non-numeric) data that have been collected for some other purposes and can further be analysed to obtain and provide additional knowledge (Singleton & Straits 2012:304-307). Secondary data provides researchers comparative and contextual data, results in unforeseen discoveries, the permanence of data despite the disadvantage of sometimes providing unsuitable definitions of concepts and the fact that there may be no real control over data quality (Singleton & Straits 2012:318-320). Primary data, on the other hand, are raw data that are collected and organised through the administration of questionnaires, conducting interviews and observations by researchers in a study. Primary data were collected from respondents through questionnaires, interviews and observations whiles secondary data was gathered from periodicals, electronic

journals, policy documents, unpublished dissertations and thesis and review of other grey literature such as reports.

3.6.4 Data Collection Instruments

The whole process of data collection is instrumentation. Data collection involves not only the selection or design of instruments but also the condition under which the instruments will be administered (Fraenkel & Wallen 2000:71). This comprises where the data will be collected, when the data will be collected, how often the data will be collected and who will collect the data. The survey technique was used to collect data. Surveys utilize written questionnaire or formal interview to gather data (Neuman 2013:49). A survey is one of the most extensively used data collection techniques as it provides accurate, reliable and valid data (Neuman 2013:316-317). Neuman (2013), however, emphasized that a lot of diligence is required when using surveys. Questionnaires, structured interviews, and observation were used to gather data from participants in this study.

3.6.4.1 Questionnaires

Questionnaires are collections of standardized written queries (called items) grouped together in a single document requiring written responses to each item which helps researchers to accurately measure constructs that can answer broader research questions to accomplish other less obvious but critical research goals about one or more specific topics (Hesse 2017:1; Smyth 2012:2; Trobia 2011:2). They are basically designed to ask series of questions relevant to a researcher's general research topic. Hesse (2017:3-4) stressed that formulating research questionnaires requires researchers to include items also known as questions that are tied to the research topic to avoid fatigue effect (participants grow tired of answering so many questions), redundant effect (participants pay no attention to questions that appear repetitive) and problem of response sets (participants automatically agreeing with every question in the questionnaire). To achieve good response rate, questionnaires must have items that are informative, interesting, meaningful to

respondents and easy to understand and to encourage optimizing (Smyth 2017:3).

In designing the questionnaire, researchers must as much as possible avoid vagueness, jargons/slangs, abbreviation, false premises, unbalanced responses and issues beyond respondents' capabilities and avoid overburdening respondents by asking questions that have no place in the research objectives (Neuman 2013:326; Smyth 2012:3). Therefore, before listing constructs to be measured and tested to achieve the research goal, researchers must have an analysis plan to direct the focus of the questionnaire (Smyth 2012:3-4). Researchers must view the questions through a respondent-centered lens as explained by Smyth (2012:4) by considering how respondents will experience the question, what design features will help respondents give an accurate response and those that will cause problems. Researchers must not assume their respondents may understand all the technicalities in their particular discipline. Hence, simplicity should be adopted in order to get positive feedback and good responses. In formulating the questions, researchers must be guided by the research objectives, hypotheses to be tested and issues under study to avoid asking questions that are not focused on the study. Research questions must not be winding and complicated but must be simple, comprehensive and structured towards key objectives of the study.

Depending on the nature of questions, questionnaires can be classified as a quantitative method (closed-ended questions) or qualitative method (open-ended questions). Specifically, most closed-ended questions are analysed quantitatively and qualitatively as open-ended questions (Dudovskiy 2017). Open-ended questions require an unstructured free response and respondents can give any answer to the question whiles Closed-ended questions requires structured, fixed responses and offers set of responses from which participants can choose (Newman 2013:331). Closed-ended questions help respondents to give easy and quick responses, easy to code and statistically analyse, allows respondents to answer sensitive questions but sometimes misinterpretation of questions by respondents can go unnoticed. Open-ended questions on the other hand permits unlimited number of possible answers, provides detailed and clarified responses, helps researchers to discover unanticipated findings, and permits adequate answers to complex issues. However, different opinions given to answers makes the coding of responses very difficult (Neuman 2013:336-338).

Although questionnaires are not flexible in terms of further probing, they are one of the best instruments used to achieve higher levels of objectivity and as stipulated by Chasteauneuf (2012:3-4). Questionnaires remove interviewer biases because of the absence of verbal presentation which can influence responses (Connaway & Powell 2010:147) and allow respondents answers to remain anonymous, provides uniformity and are less time-consuming. To provide rich empirical data for researchers, questionnaires best complement other sources of data. Collecting information from a large group of participants can be a laborious and time-consuming task. To address statistically large number of subjects as a way of gathering information, questionnaires are the best tool to be used.

Furthermore, focus, simplicity, and brevity are extremely vital when formulating and designing questionnaires. Moreover, Alreck and Settle (1985:87-89) explained that participant's anonymity can inculcate confidence in them to provide candid responses to questions asked, which is a great strength of using questionnaires. Despite the advantages of providing standardized answers, eliminating effects of personal interaction, economical in terms of money, time and materials, Denscombe (2007) adds that lack of opportunity to clarify questions and responses for truthfulness of thoughts given by participants remains a great challenge. The researcher travelled to the university libraries to self-administer the questionnaire. In most of the universities (seven universities), the university librarians introduced the researcher to some of the staff especially the heads of units. After the introduction, a representative was assigned to distribute and collect the questionnaires on behalf of the researcher. After the questionnaires were collated by the representatives from some of the universities, they were sent to the researcher by post (via DHL courier service). With three of the universities, the researcher personally collected the questionnaires because they were within the city the researcher was located. Questionnaires were self-administered to heads of units of the libraries, Junior and senior staff in the various units to solicit their views to answer the research questions to achieve the objectives of the study. This is to give the respondents space and time to fill out the questionnaire at their comfort without any interferences from the researcher to avoid biases. The questionnaires were structured into sections, each representing one objective of the study. This was done to help delve deep into issues under each objective to adequately answer the research questions.

3.6.4.2 Interviews

Interviews are "purposeful conversations between two or more people (interviewer and interviewee(s)) to collect data on some particular issues" (Persaud 2012:2) and as posited by Creswell (2014:241) they allow researchers to control the line of questioning and obtain exhaustive information from interviewees to answer to the research question. By so doing, researchers can explore issues in-depth and understand concepts from stakeholders' perspective. Interviews in this regard, are the best tools to explore issues comprehensively because they are driven by question-answer sequence (Roulston & Choi 2018:2). Although interviews take a lot of time and efforts, the possibility of collecting detailed information about the problem that is being investigated makes it a great tool to use in collecting qualitative data (Dudovskiy 2017) and grants researchers the opportunity to ask extensive questions as well as give a good response rate to issues that are further inquired.

Interviews take different forms. They can be structured, unstructured and semi-structured. For the purposes of this study, the semi-structured interview will be used. This is to help the researcher get a profound understanding of issues from the interviewees to avoid bias (shared opinions of the interviewee) which comes with using the unstructured interview technique. With semi-structured interviews, researchers can use both the same set of questions for all interviewees and also have the advantage of probing further on questions to clarify certain issues that come up during the interview. Roulston and Choi (2018:2) explain that in semi-structured interviews, follow-up questions also known as probes are formulated relative to what the interviewee has already said. Hence, researchers sequence questions to generate free-ranging conversations and the probing of the questions are directed by what respondents say. In terms of ethics, researchers using this method of data collection must attend to what is required in terms of disciplinary traditions, cultural and institutional context. In formulating interview guides (questions to be asked) researchers must be keen on the conceptual frames that will be used to analyse the data and the form of the interview to be used. To probe further into the core issues, researchers must begin asking questions from a broader perspective and gradually move to a more specific question. Focus is key in the interview

process by bearing in mind that interviews need to be managed and as agreed by Bromley (2014:6), that researchers must keep on the topic (be more focused and specific) but allow respondents to speak. Thus, interviewers must periodically review and recap to check understanding. This should, however, not deter interviewers to pause to ask for a further interpretation.

In this study, the researcher had interviews with all the University Librarians of the Public Universities involved in the study to gather information about policies, commitments and the preparedness of the libraries to manage indigenous knowledge and integrate it into their collection. This provided in-depth information and the researcher always checked for accuracy and relevance by probing further into the issues. On the negative side, Denscombe (2007) explained that analyzing data collected from interviews can be difficult and time-consuming. He further stated that consistency and objectivity are hard to achieve in interviews which have an adverse effect on reliability and data from interviews are based on what people say rather than what they do. However, the researcher overcame these challenges by asking interviewees to further explain statements which were not clear and that may have contradicted what the researcher observed. Semi-structured interviews were used because they save time and presented information collected from all the different respondents in almost the same form and order. The interviews complemented the questionnaire and helped clear grey areas that the questionnaire failed to deal with. The interview process as a data collection procedure gave the researcher ample time with interviewees (because it was a one-on-one interaction with the University librarians), allowing the researcher to explain more explicitly the purpose of the study and thereby making access to confidential issues and policy matters easier. The researcher travelled to majority of the universities to conduct the interview with the university librarians based on an already scheduled dates and time. Three of the university librarians also scheduled the interview with the researcher in her city because they had come for programmes within the city and wanted the researcher to take advantage of that period to avoid travelling to their regions again. Two of these interviews were conducted in the researcher's office and one was conducted outside the researcher's office but within the university where the researcher works. Some of the interviews were very interactive and so lasted for more than an hour. However, on the average the researcher spent an hour during each interview session.

Also, the interview was appropriate for the researcher because the interviewees were in better positions to give detailed and accurate information on issues that were not adequately covered by the questionnaires. Besides as triangulation was explored, the researcher used interviews as one of the tools to get an exhaustive understanding of the research problem.

3.6.4.3 Observation

Observation is a qualitative data collection instrument to observe the study population, the study setting and their actions from the researcher's own perspective rather than participants perspective. By using this tool, an observer usually participates in the daily routines of the study objects and settings to produce written accounts of ongoing interactions (Waterfors 2018:2). Observation involves "systematic observation, recording, description, analysis, and interpretation of people's behaviour" (Saunders et al 2012:340; Connaway & Powell 2010:180). Observational data is a primary data and basically first-hand report and drawing on field presence, the observer documents field notes to capture events from their perspective as a witness.

Observation offers the researcher a discrete way of collecting data and thus draws on the direct evidence of the eye to witness events firsthand (Asamoah 2013:84). Observations help researchers to directly record what people do, as discrete from what they say they do. On the other hand, observations focus on what happens and not why it happened (Denscombe 2007). Observations can be structured (using variables from the pre-defined schedule) or unstructured (conducted in an open manner, no predetermined variables/objectives) (Dudovskiy 2017; Punch 2012:153). Quantitative approaches are structured using predeveloped observation schedules or checklist while qualitative approaches are unstructured and behaviours or events are observed as the stream of actions and events as they obviously evolve (Punch 2012:154; Saunders *et al* 2012:340). Although there are observer biases and errors with the use of observation, it is flexible and provides researchers with direct information from what they directly observe on the field and from respondents. The researcher observed and went through the libraries collections if there was any evidence of managing indigenous knowledge directly or indirectly.

3.6.4.4 Document Assessment and Analysis

Most often, researchers need to review documents on policies, reports, standards, procedural manuals among others to gather secondary information which may be relevant to the focus of the research. This technique of data collection is normally referred to as document assessment or document analysis or review which Creswell (2009:181) explains as assessing information in policies, procedures, standards, reports and other relevant documents. These documents may include but not limited to reports, procedural document, government papers, journals, diaries, newspapers etc. It is evident that not all information may be articulate and perspective. Notwithstanding, document assessment are inconspicuous source of information, saves researchers time and expense of transcribing recorded information (Creswell 2014:241-242). The researcher assessed the collection development policies of the universities to find out whether there was any aspect of the policies that dealt with the management of indigenous knowledge. The researcher also used information from journals, reports and other related documents to study the growing trends of indigenous knowledge management through the literature review.

3.6.4.5 Validity and Reliability of Instruments

The quality of a good research falls on reliability and validity which are the two most important measure of research (Curtis & Curtis 2011). The extent to which a research can be replicated by different researchers under different conditions and the extent to which true claims can be made out of the findings aptly, profoundly and usefully free from error define reliability and validity (Curtis & Curtis 2011; Dooley 2001:76). In assessing the validity of a study, Ngulube (2005:132) asks three questions of interest: "has the research measured the phenomenon of interest in a manner that accurately reflects its characteristics? to what extent is the sample appropriately drawn? is the sample a true reflection of the population? and can the results of the research help in determining something about the population?" These elements are seen as a checklist to ensure that a research represents a true reflection of the available data and the reality behind the facts or data.

Although validity has not been clearly defined in mixed method research, Mavodza (2010:101) concludes that corroboration of results from different methods validates the approach and makes

the results complementary to each other. Getting valid and reliable results free from error can be appropriately addressed using data triangulation. This is because triangulation of data, data sources and theory complement each other. Therefore, where one tool is deficient, the other complements it to achieve an accuracy of data. According to Ngulube (2005:135), "if a research lacks validity, it does not add any value to society's knowledge base". To ensure the validity and reliability of the study, a follow-up interview was conducted based on the findings to examine whether the comments were consistent or varying. These were done through phone calls. The responses from different sources of data were examined to see whether there were any converging opinions from respondents to build a comprehensible rationalization for the major concepts and themes in the study. The designed questionnaire and interview schedule were pre-tested on few (20) participants at the University of Ghana who were not part of the selected group for the study. This was meant to help improve on the questionnaire and structured interview and help solve the problem that may be encountered before the actual survey was conducted. The researcher by so doing was able to minimize errors and improve the reliability and validity of the findings.

3.7 DATA ANALYSIS AND INTERPRETATION

The end-product of every research is to organise, present, and interpret the data collected into a meaningful form called findings of results. These findings are then interpreted to answer the research question and probably make a generalization of the entire population which could be directed towards people, governments, institutions and their systems depending on a researcher's study objects. Methods for analysing according to Punch (2012:171) must be systematic, disciplined, transparent and described. The purpose of primary data analysis is to streamline data in order to make it comprehensible and presentable to provide answers to the research question. Data analysis involves organizing collected data into manageable units, synthesizing and searching patterns to discover central elements that can be generalized in a particular context (Connaway & Powell 2010:224). Depending on the type of data collected, analysis can be done quantitatively (using statistical methods) or qualitatively (using thematic or content analysis to explain the findings because not all data are quantifiable).

The Statistical Package for Social Sciences (SPSS) was used to analyse the quantitative data collected. The researcher used codes which were developed from the research questions. The data entry was done using excel. Values and labels for each variable was entered and frequencies were run for each variable. Using descriptive statistics, data was examined, and the results were summarized in figures, tables and frequencies. Descriptive analysis was used to summarize the results in figures, tables and frequencies and the results were constructively analyzed. The choice of descriptive statistics is because both "frequency distribution tables and pictorial representations can be used to portray a variety of characteristics of cases or individuals with respect to variables measured, capable of characterizing what is typical in a group case, indicates how widely cases in a group vary" (Connaway & Powell 2010:269-270).

Content analysis was used to analyze the qualitative data to help generate concepts. Data was developed into codes. Each theme developed based on the objectives of the study were assigned with selective codes which were used to generate data for the qualitative analysis. Qualitative content analysis as explained by Schreier (2014) as systematically describing qualitative data by assigning successive parts to categories of a coding frame. This method according to Denzin and Lincoln (2011) captures facts using words, statements and sometimes visuals to provide a richer description of the phenomena of interest than can be described with statistics which are more abstract. This method is systematic, reduces data and is more flexible and helps researchers to focus on aspects that relates to the objective of the study. Data collected from interviews was used to complement and validate data collected from questionnaires. Data obtained from questionnaires and interviews that addressed a particular research theme was presented together in relation to the objectives of the study. However, data from respondents from the various Universities was analyzed in aggregate. General views of participants were presented to ensure confidentiality and anonymity.

3.8 ETHICAL CONSIDERATIONS

Ethical issues must be considered from the start of the research to its conclusions and recommendations. Punch (2012:50) reiterates that ethical issues drench all the phases of the

research process. Hence, right from deciding on the research topic through to the end of the research process, researchers must apply ethics. To give an accurate evaluation of the research processes especially on methodologies that are used in research, Ngulube (2005:140) draw emphasis on researchers' obligation to the research community for future replication and testing of the validity of their study by other researchers. In view of this, Saunders et al (2012:236) accentuates that at the different stages of research, ethical issues should reflect in terms of integrity and objectivity, respect, privacy, voluntary participation, right to withdraw, informed consent, confidentiality and anonymity, data management compliance, responsibility in analysing, reporting and safety. It is therefore domineering for researchers to uphold these values and be circumspect that "research and the pursuit of knowledge should not in themselves be regarded as the supreme goal at the expense of the rights of participants and institutions" (UNISA 2016:14).

Every research irrespective of the research design and method adopted must conform to voluntary participation, informed consent, no harm to participants, anonymity and confidentiality (UNISA 2016:14-17; Le Roux 2015:92-94; De Vaus 2012; Saunders *et al* 2012:233-237; Creswell 2009). Misinterpretation of data and findings also have an influence on ethics in research. Ethical issues simply constitute the code of conduct for researchers. The ethical issues considered as part of the fieldwork experience were informed consent, anonymity, and confidentiality, integrity and objectivity, respecting the privacy of respondents and conforming to the University of South Africa policy on academic integrity and research ethics (UNISA 2017; UNISA: 2016). Participants were assured of informed consent through providing adequate information on goals of the research, possible advantages and disadvantages of participating in the study and the credibility of the researcher.

It was anticipated that by providing participants with exact and complete information, they would understand the purpose and processes of the research and decide to voluntarily participate. Respondents were assured of confidentiality and anonymity through the non-solicitation of their identities. The researcher assured participants that information disclosed will be kept confidential and used for research purposes only. As part of the ethical principles that were upheld, the

researcher allowed respondents who were occupied with work or personal activities to finish before engaging them in any dialogue. According to Neuman (2006:219-222), the basic principle of social research is on no account compelling anyone into participating; participation must be voluntary at all times. Participants were assured of their right to refuse to respond to certain questions and to decide what information they were prepared to divulge. The researcher did not manipulate data for the purposes of the research needs. All sources that were consulted and used, were duly acknowledged to avoid plagiarism.

Ethical issues were considered and adhered to in the study because the study involved collecting data or information from people and systems in their respective institutions which in most cases may be confidential. Consequently, researchers must identify and consider the ethical issues involved in their study and how they will be dealt with (Punch 2012:49). The researcher adhered to the professional code of conduct established guidelines in the institutions under study and scientific standards throughout the study. The study was guided by the ethical consideration of UNISA research ethical guidelines on research ethics, copyright infringement, informed consent, and plagiarism. UNISA documents on Policy on Academic Integrity (2017), Policy on Research Ethics (2016) and UNISA code of Ethics and Conduct (2007) were used to follow the procedures of abiding by ethical rules of the study. The researcher was issued an ethical clearance certificate to pursue the research by the research ethics review committee of the Department of Information Science, UNISA. The researcher requested permission to conduct the study in the Universities from the Heads or Directors of the University Libraries (University Librarians) and the researcher was permitted to conduct the study.

3.9 EVALUATION OF THE RESEARCH METHODOLOGY

Research cannot be conducted devoid of specified methods and procedures that are followed to come up with specific or generalized conclusions. In this chapter, the researcher critically discussed the methodology that was adopted and analytically followed throughout the study from paradigms through to ethical issues. Justifications and explanations of the choice of paradigms,

approaches, and methods were given to provide clarification to the procedures that were followed in the entire study and their philosophical backgrounds. Issues of misconceptions of research methods, validity and reliability of instruments were discussed to give in-depth understanding and clarity to the methods adopted for the study. Most importantly, the study adhered to all the ethical considerations in research in the context of the subject area and objects of study to maintain objectivity, integrity, and authenticity of the research. The methodology used was very appropriate and well situated for a study of this nature. The researcher had the advantage to dissect and use various tools to collect data and also combine the effectiveness and strength of both qualitative and quantitative methods for a valid, reliable and trustworthy results.

CHAPTER FOUR: DATA ANALYSIS AND PRESENTATION OF FINDINGS

4.1 INTRODUCTION

The objective of every research is to transform the data collected into facts that are meaningful to achieve the purpose of the research. Thus, this chapter sets the tone to present the findings from the data collected into an organized and meaningful form. Integrating findings from mixed method research from both quantitative and qualitative aspects can be a daunting task in terms of coherence because it involves the use of one or more of both quantitative and qualitative data analysis techniques (Vogl 2018; Bazeley 2018; Onwuegbuzie & Combs 2010; Tashakkori & Teddlie 2010).

Data can be analysed in a mixed method research concurrently and sequentially depending on the purpose for using mixed methods design. The purpose may be for triangulation, complementarity, development, initiation and expansion based on existing mixed methods research paradigm (Creswell 2015; Onwuegbuzie & Combs 2010; Creswell & Plano Clark 2011). Once data from both quantitative and qualitative methods has been analysed, the data can be integrated into an appropriate way based on the purpose of the study (Onwuegbuzie & Combs 2010). The goal here is to minimize weaknesses in both approaches while maximizing the strengths to come up with more comprehensive conclusions, and recommendations from the research. This helps researchers to identify the point of convergence or divergence between the data analysed to produce mutually complete results.

The presentation of findings is guided by the research objectives categorised into the following themes.

- Mission, scope and focus of library collections
- Awareness and understanding of indigenous knowledge (IK)
- Policies and frameworks governing the management of indigenous knowledge
- Knowledge organisation system (KOS) used in the Library
- Library Programmes and Services

- Integration of indigenous knowledge into library services
- Staff training programmes on indigenous knowledge
- Tools and expertise needed for the management of indigenous knowledge
- Indigenous knowledge and education
- Indigenous knowledge and sustainable development
- Indigenous knowledge and intellectual property rights
- Information communication technologies and indigenous knowledge systems

Table 4.1 shows the objectives of the study and the corresponding theme.

Table 4.1: Objectives and corresponding theme

Objective	Theme(s)
To find out whether the mission of universities in Ghana include aspects on the effective management of IK towards sustainable development	Mission, scope and focus of libraries collections
	Indigenous knowledge and education
	Indigenous knowledge and sustainable development
To identify whether the management of IK is captured in the collection development activities of academic libraries in `Ghana	Awareness and understanding of IK
	Policies and frameworks governing the management of IK
	Knowledge organisation systems used in the library
To identify the existing attempts at IK management in academic libraries in Ghana	Library programmes and services
	Integration of IK into library services
	Staff training programmes on IK

	Indigenous knowledge and education
	Indigenous knowledge and sustainable development
To identify the tools and expertise needed for the effective management of IK based on existing models	Tools and expertise needed for the management of IK
	ICTs and IK
To find out the challenges faced by information professionals in managing IK in academic libraries in Ghana	Mission, scope and focus of libraries collections
	Awareness and understanding of IK
	Policies and frameworks governing the management of IK
	Knowledge organisation systems used in the library
	Library programmes and services
	Integration of IK into library services
	Tools and expertise needed for the management of IK
	Indigenous knowledge and education
	Indigenous knowledge and sustainable development
	ICTs and IK

The quantitative data was presented using descriptive statistics such as tables, graphs, charts to provide information about the variables in the dataset and highlight potential relationship between the variables. For the qualitative data, content analysis was used to analyse the data. The use of content analysis was suitable for the study because in addition to data collected through interviews and observation, various policy documents from the universities were critically analysed. This was done manually by the researcher.

The qualitative and quantitative data was analysed under the same theme and the results were integrated in the discussion according to the themes developed from the data collected. Where the same questions were asked between the various categories of respondents, they were analysed cumulatively. In presenting the responses, the yes and no responses were illustrated with charts to make them more visible. Questions that had multiple and as many applicable selections was illustrated using tables. Questions that were the same for both staff and heads of units were represented together in a table distinguishing the responses of both categories of staff (Staff and Heads of Unit). Open-ended questions were coded and represented in tables. It was vital to note that under each theme or research objective, series of questions were asked to better explore the theme to achieve the purpose of the study.

4.2 RESPONSE RATE

One significant aspect of research is representation of the population to represent the perspective of everyone whom the study refers to generalize the results to the entire population (Allen 2017). A response rate of 70% and above is thus a very good indicator of representation (Allen 2017; Babbie & Mouton 2001). Overall, the response rate was 88.9%. There were three different categories of staff representing management (University Librarians), middle management (Heads of Units/Sections in the Library) and Operational staff (Senior and Junior Staff) who for the purposes of clarity were categorised as staff. These different categories of staff were given different sets of questionnaires commensurate with their stations. The operational staff although comprising of both senior and junior staff were given the same set of questionnaires (quantitative).

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Thus, their respective responses were analysed. The heads of units were also given a separate set of questionnaires (quantitative data) and the University Librarians were interviewed per institution (qualitative data).

Out of the 260 participants, 231(88.9%) responses were received of which 9(3.9%) were University Librarians, 42(18.2%) were heads of units of the various departments or sections in the library and 180(77.9%) were senior and junior staff who represented the staff category in the library. Within the various categories of staff, the response rate was above 80% indicating that there was a higher degree of representation and so the findings could be generalized to the entire population which was a homogenous one and essentially alike in terms of functions and structure of operations. The breakdown of the response rate is tabulated in Table 4.2 below:

Table 4.2: Response Rate of Participants

Category of Staff	Type of Data	Sample	Response Rate within each category
University Librarian	Qualitative	10	9 (3.5%)
Heads of Units	Quantitative	50	42 (18.2%)
Staff	Quantitative	200	180 (69.2%)
Total	Mixed Data	260	231 (88.9%)

Source: Participants Data, 2019

4.3 QUANTITATIVE FINDINGS

Overall, 222(88.8%) questionnaires were received from both heads of units and staff out of the 250 questionnaires that were sent out. In most instances frequencies and percentages were used to describe the data while in other instances mean and standard deviation were used to describe the data based on a minimum and maximum range of 1 to 5. The mean shows the value, or average scores while the standard deviation measures the average amount of variability in a set of scores as the average distance from the mean to measure the relationship among the variables that are used (Salkind 2007; Chireshe 2015:117-119). Thus, the standard deviation is the average spread from the mean or spread around the mean. As explained by Salkind (2007) and Chireshe (2015), the larger the standard deviation, the more spread out the values are from one another (responses vary greatly from the mean) and a low standard deviation means that the responses are similar to the mean. The mean and standard deviation were used in instances where respondents were asked to show their level of agreements or how important they rate responses to particular statements. Within this range, a standard deviation close to the mean shows high levels of variations in responses and a lower standard deviation shows that responses are very similar to the mean.

4.3.1 Characteristics of Respondents

The characteristics of respondents were focused on the university of affiliation of respondents, the gender of staff, number of years they had worked at the library, the department/section/unit they work, their level of education and rank within the library. Questions relating to the age, gender, number of years of working, level of education were only directed to the staff. Whereas all heads of units were in addition asked to indicate their respective units. University Librarians were not asked such questions because they were the heads of the entire library and were not limited to one particular unit. Questions were not asked on the position or rank of the University Librarians and heads of units because the positions were appointive ones and predetermined. Therefore, one must meet the standards required to be appointed as such and so there was no need asking for such information.

4.3.1.1 University Affiliation and Distribution of Categories of Staff

Respondents were asked of their university of affiliation to know the university they belong to. This was to help the researcher know where each participant worked and to determine the distribution of respondents from each university. This question was directed to all the participants. The universities were also grouped into three zone based on the proximity to each other as already mentioned (see Chapter Three). The zones were the Northern Zone (KNUST, UDS, UENR); the Middle Zone (UCC, UEW, UMAT) and the Southern Zone (UG, UHAS, GIMPA, UPSA). The responses are represented in the table 4.3

Table 4.3: University Affiliation and Distribution of Categories of Staff

University Affiliation		Responses			
		University Librarians	Staff	Heads of Unit	Total
Northern Zone	KNUST	1	40	10	51 (22.1%)
	UDS	1	25	5	31 (13.4%)
	UENR	1	7	1	9 (3.9%)
Total		**3 (1.3%)**	**72 (31.2%)**	**16 (6.9%)**	**91 (39.4%)**
Middle Zone	UCC	1	30	10	41 (17.7%)
	UEW	-	5	1	6 (2.6%)
	UMAT	1	6	1	8 (3.5%)
Total		**2 (0.9%)**	**41 (17.7%)**	**12 (5.2%)**	**55 (23.8%)**
Southern Zone	UG	1	40	10	51 (22.1%)
	UPSA	1	6	1	8 (3.5%)
	GIMPA	1	6	1	8 (3.5%)

		1	15	2	18 (7.8%)
	UHAS				
Total		4 (1.7%)	67 (29.0%)	14 (6.1%)	85 (36.8%)
Overall Total		9 (3.9%)	180 (77.9%)	42 (18.2%)	231(100%)

Source: Participant Data, 2019

From table 4.3, 9(3.9%) University Librarians were interviewed, 180(77.9%) staff responded to the questionnaire for staff whilst 42(18.2%) heads of units responded to questionnaires for the Heads of Units. The Northern Zone constituted 91(39.4%) participants comprising of KNUST-51(22.1%), UDS-31(13.4) and UENR-9(3.9%). The Middle Zone constituted 55(23.8%) which included: UCC-41(17.7%), UMAT-8(3.5%) and UEW-6(2.6%). The Southern Zone constituted 85(36.8%) comprising of UG-51(22.1%), UHAS-18(7.8%), GIMPA-8(3.5%) and UPSA-8(3.5%).

4.3.1.2: Functions of Units/Sections/Departments: Heads of Units

Heads of units were asked about the strategic goals of their unit, its functions, staff capacity and users of the unit. When asked about the strategic goals of their respective units, all participants noted that their strategic goal was aligned to the main goals of the university and deducing it specifically to the library, the overall goal was to provide information resources and services in different formats that supports teaching, learning and research.

In respect to the functions of the units, respondents indicated their functions according to their unit presented in summary in figure 4.1 below.
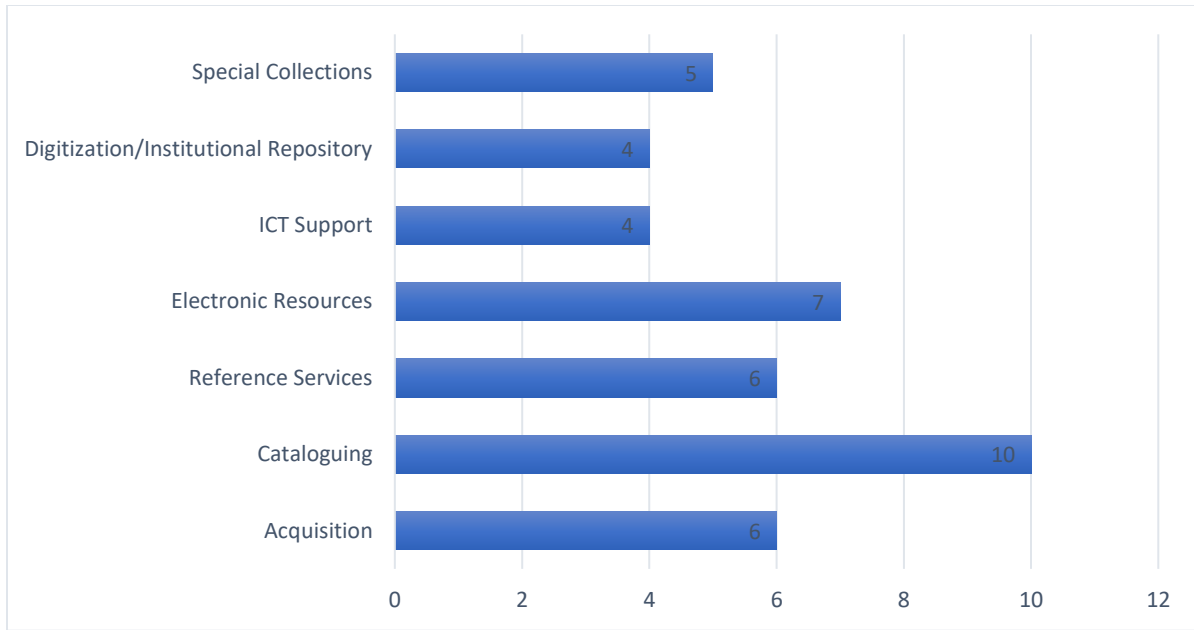
Figure 4.1: Functions of Units/Sections/Departments

Source: Heads of Unit Data, 2019

From figure 4.1, out of a total of 42 Heads of Units, 10(23.8%) indicated their function was cataloguing, 7(16.7%)-Electronic Resources, 6(14.3%)-Acquisition and Reference Services respectively, 5(11.9%)-Special Collections and 4(9.5%)-ICT Support, Digitisation/ Institutional Repository respectively.

When asked who the users of the unit were, they all indicated the users were students, faculty, researchers and staff (academic and non-academic). In terms of staff capacity in their respective units, the capacity of staff was dependent on the size of the units. It was also dependent on how big the institution was. But it was observed that at least in each institution, there was one or more senior and junior staff within a unit. Even for some of the big departments, there were more than one senior members with one as the head of the unit.

4.3.1.3. Staff Gender

Staff who worked at the operational level (senior and junior staff) in the library were asked to indicate their gender. Below is the distribution of staff gender (Junior and Senior staff) represented in table 4.4.

Table 4.4: Staff Gender

	Responses	
	Male	**Female**
Staff Gender	**Frequency (Percentage)**	**Frequency (Percentage)**
	111 (62%)	69 (38%)

Source: Staff Data, 2019

From table 4.4, 111(62%) respondents were male while 69(38%) of the staff category were female. This shows that there were more males who worked at the library in different capacities than females. This was also true from observations made by the researcher.

4.3.1.4 Staff years of Working Experience

The number of years one works in a particular field can be a factor in building skills and expertise in the field. Based on this, staff were asked to indicate the number of years they had worked at the library and the responses were illustrated in figure 4.2 below.
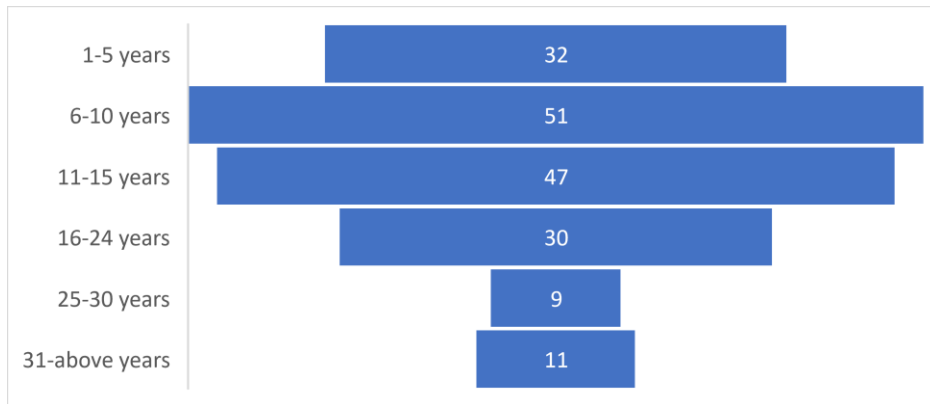
Figure 4.2: Staff years of Working Experience
Source: Staff Data, 2019

Figure 4.2 shows the number of years of working experience by staff. From figure 4.2, 32(17.8%) had worked in the library between 1-5 years; 51(28.3%) had worked in the library for 6-10 years; 47(26.1%) had worked for 11-15 years; 30(16.7%) had worked for 16-24 years; 9(5.0%) had worked for 25-30 years and 11(6.1%) had worked for 31 and more years at the library.

4.3.1.5 Staff Section/Unit

The management of indigenous knowledge requires a collaborative effort, skills and expertise from diverse backgrounds. Thus, it was important to solicit information from staff on their units. Departments, sections and units were used interchangeably here because whereas some universities used units, some used sections or department for the division of the various functions within the library. The responses from staff are represented in figure 4.3.
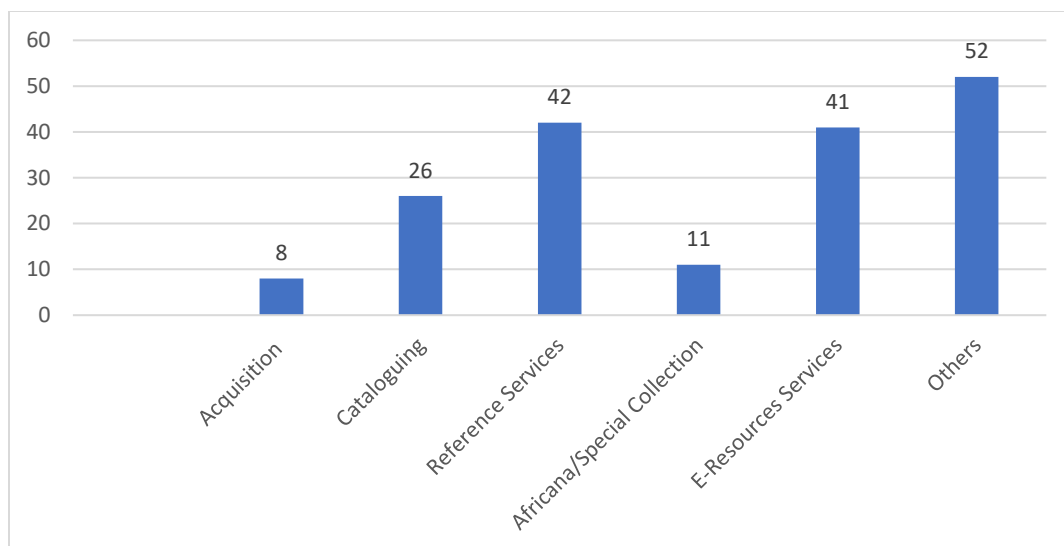
Figure 4.3 Staff Section/Unit
Source: Staff Data, 2019

In reference to the department/section/unit that the staff were positioned, 52(28.9%) indicated others of which 10 indicated digitisation and institutional repositories, 15 indicated technical services whiles the rest of the respondents did not specifically state their units but generalized as others. Out of the 52 that indicated others, 18(10%) indicated digitisation unit; 9(5%)-technical services; 12(6.7%)-periodicals and 13(7.2%)-circulation unit. With the rest of the traditional departments, 42(23.3%) indicated they were in Reference Service; 41(22.8%)-Electronic Resources Services; 26(14.4%)-Cataloguing unit; 11(6.1%)-Africana/Special Collection unit and 8(4.4%)-Acquisition unit.

4.3.1.6 Staff Level of Education

Staff were asked their level of education. The educational level of staff ranged from master's degree- 49(27.2%); bachelor's degree-62(34.4%); diploma-43(23.9%) and senior high school certificate-26(14.4%). This is illustrated in figure 4.4.
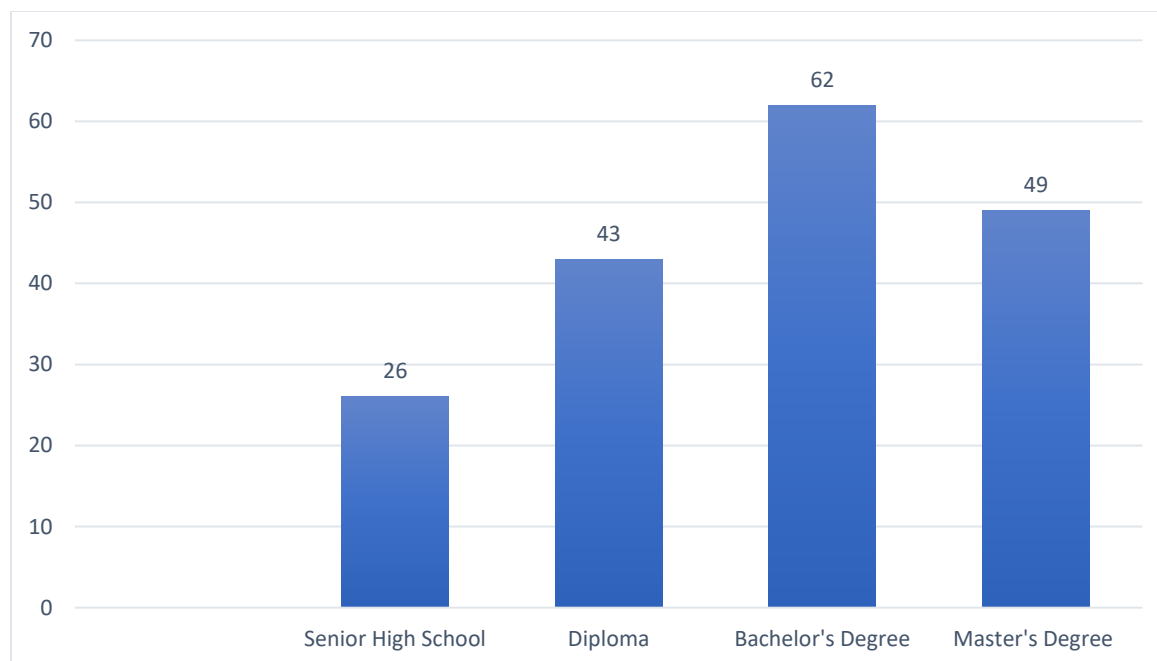
Figure 4.4: Staff Level of Education
Source: Staff Data, 2019

4.3.3 AWARENESS AND UNDERSTANDING OF INDIGENOUS KNOWLEDGE (IK)

Under this theme various questions were asked from both Staff and Heads of Unit. Staff were given options to choose from while Heads of Units were asked open-ended questions to voice out their respective opinions. Some of the questions asked were the same for both staff and heads of units and such responses were put together.

Participants were asked whether they were aware of indigenous knowledge. The responses of both staff and heads of units are presented in the figure 4.7. Out of 180 staff, 148(82.2%) said they were aware of indigenous knowledge while 32(17.8%) mentioned they were not aware. With the heads of units, out of the 42 heads, 36(85.7%) gave affirmative response while 6(14.3%) mentioned they were not aware of indigenous knowledge. Combining the two responses from the two categories of staff, 184(82.9%) indicated their awareness of IK while 38(17.1%) were not aware of IK. This suggested that the majority of participants were aware of IK.
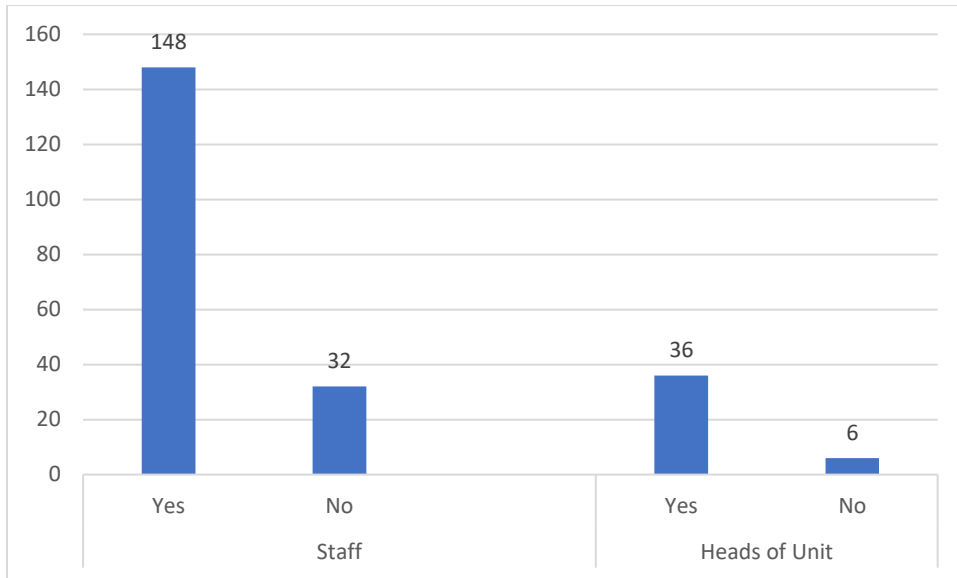
Figure 4.5: Awareness of Indigenous Knowledge
Source: Staff and Heads of Units Data, 2019

This was followed-up with a question to staff on how they became aware of IK. There was multiple selection of responses by staff. The responses are illustrated in the figure 4.6
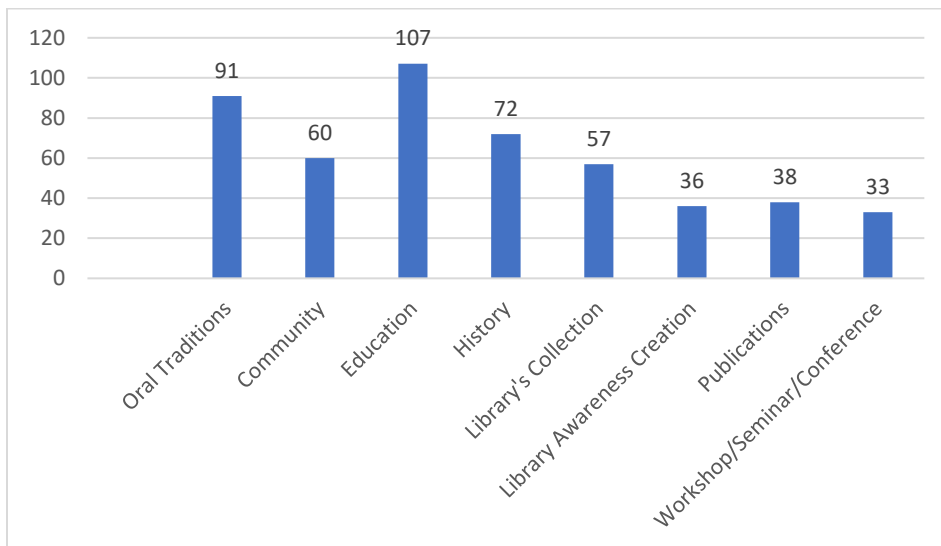
Figure 4.6: How staff became aware of IK
Source: Staff Data, 2019

Figure 4.6 shows that staff indicated various ways through which they became aware of indigenous knowledge. These were education-107(59.4%), oral traditions-91(50.5%), history-72(40%), community-60(33.3%), library's collections-57(31.7%), publications-38(21.1%), library awareness creation-36(20%), workshop/seminar/conference-33(18.3%).

4.3.3.1 Understanding of Indigenous Knowledge

After the majority of Heads of Units said they were aware and understand what constitute IK. They were then asked to in their opinion explain what they thought indigenous knowledge was and the responses are summarized in figure 4.7.

Figure 4.7: Understanding of Indigenous Knowledge: Heads of Units
Source: Heads of Unit Data, 2019

From figure 4.7, respondents were aware and understood what IK was to reflect culture, oral traditions, non-scientific knowledge, local knowledge, traditional knowledge, community-based

knowledge, culturally relevant knowledge, knowledge of society and traditional people knowledge.

Heads of Units and Staff were further asked to indicate their Level of agreement or disagreement with what indigenous knowledge was. Within a range of 1 to 5 using the mean and standard deviation, where the highest mean of 5 shows highest level of agreement and lowest mean of 1 shows highest level of disagreement. The responses of are presented in table 4.4.

Table 4.5: What is Indigenous Knowledge

What is Indigenous Knowledge?	Responses									
	Staff					Heads of Unit				
	Frequency	Minimum	Maximum	Mean	Standard Deviation	Frequency	Minimum	Maximum	Mean	Standard Deviation
1. Knowledge unique to a particular culture/society and form the basis of local decision making on every aspect of people in the community and their way of life	180	1	5	4.12	1.140	42	2	5	4.62	0.731
2. Knowledge that a community possesses and develop over time and continue to develop	180	1	5	3.91	1.012	42	1	5	4.33	1.183
3. Knowledge embedded in community practices, institutions, relationships and rituals	180	1	5	3.69	1.220	42	1	5	4.38	0.962
4. Knowledge based on experiences tested over centuries of use	180	1	5	3.52	1.160	42	1	5	4.10	1.031
5. Knowledge adapted to local culture and environment	180	1	5	3.67	1.061	42	1	5	4.19	1.065

Statement	N	Min	Max	Mean	SD	N	Min	Max	Mean	SD
6. Knowledge based on information, practices, beliefs, experimentation, technologies, informal education and communication	180	1	5	3.78	1.291	42	1	5	3.95	1.229
7. Knowledge based on oral traditions, culture and indigenous skills	180	1	5	3.93	1.078	42	2	5	4.48	0.740
8. Knowledge expressed in local languages	180	1	5	3.54	1.105	42	1	5	3.38	1.513
9. Knowledge possessed by any community, rural/urban, original inhabitants/migrants, settled/nomad	180	1	5	3.74	1.063	42	1	5	3.76	1.284
10. Knowledge transmitted orally from generation to generation and not systematically documented	180	1	5	3.56	1.269	42	1	5	4.00	1.210
11. Knowledge that tacit and difficult to codify	180	1	5	2.92	1.179	42	1	5	3.67	1.337

Source: Staff and Heads of Units Data, 2019

From table 4.5, both staff and heads of units agreed to the statements on what constitute indigenous knowledge. from table 4.5, it is seen that both staff and heads of units strongly agreed with the statement 1 with a Mean (M) of 4.12 and 4.62 and a standard deviation (SD) of 1.140 and 0.731 respectively, showing that there was a high level of agreement. In as much as both staff and heads of department agreed with all the statements from 1 to 11 in table 4.5, it is observed that when it comes to IK been knowledge that is tacit and difficult to codify (statement 11), staff had a mean of 2.92 and a standard deviation of 1.179 showing that they neither agree or disagree with the statement (neutral). However, the standard deviation of 1.179 shows there were variations in the responses, where some staff may have had other opinions. In general, the mean and standard deviation from both staff and heads shows a good level of agreement, meaning all the statements (1-11) in table 4.5 are a true reflection of the various definitions of what constitutes indigenous knowledge.

After giving their varied opinions, Heads of Units were further asked whether they perceive IK as important with 38(90.5%) indicating yes, while the rest gave a no response. Thus, it can be gleaned from the findings that IK was perceived as important.

It was observed from literature that IK is becoming extinct and therefore needs urgent attention to safeguard it (Ngulube 2002; Sithole 2007, Lwoga & Ngulube 2009; Sarkhel 2016; Dlamini & Ocholla 2018:137). To know existing perceptions and trends in Ghana, Heads of Units were also asked whether they see IK as becoming extinct. Out of the 42 participants, 37(88.1%) said IK is becoming extinct and needed to be preserved. This agrees with statements by scholars that IK is becoming extinct and needs to be managed and preserved.

4.3.3.2 Types of Indigenous Knowledge Known

Heads of unit and staff (junior and senior staff) were asked to indicate the types of IK that were known to them. Respondents were asked to select multiple options that were applicable to them. The responses are presented in table 4.6 in frequencies and percentages.

Table 4.6: Type of IK known

	Responses			
	Staff		Heads of Units	
Type of IK Known	Frequency	Percentage	Frequency	Percentage
Health Care	114	63.3%	40	95.3%
Education	100	55.6%	36	85.7%
Natural Resource Conservation/Management	90	50.0%	36	85.7%
Agriculture	106	58.9%	40	95.3%

Conflict Resolution/Management	93	51.7%	34	80.9%
Oral Traditions	140	77.8%	40	95.3%
Culture (Traditions, festivals, ceremonies)	133	73.9%	42	100%
Music and Dance	126	70.0%	42	100%
Religion	120	66.7%	42	100%
Artefacts	91	50.6%	34	80.9%

Source: Heads of Unit and Staff Data, 2019

From table 4.6, staff indicated that the type of IK known to them were oral traditions (77.8%), music and dance (70%), religion (66.7%), health care (63.3%), agriculture (58.9%), education (55.6%), conflict resolution/management (51.7%), artefacts (50.6%) and natural resource conservation/management (50%) while heads of units indicated culture, music and dance, religion (100%), oral traditions, healthcare, agriculture (95.3%), education, natural resource conservation/management (85.7%), conflict resolution/management and artefacts (80.9%). This shows that on the average respondents were aware of IK and its various types.

4.3.3.3 Nature of IK in Library's Collections

Mhlongo (2018:140) opined that providing materials in other formats apart from books, e-books and databases ensures inclusivity. Both staff and heads of units were asked to indicate the nature of IK in their library's collection. The nature of IK gives an idea of the form in the library's collections.
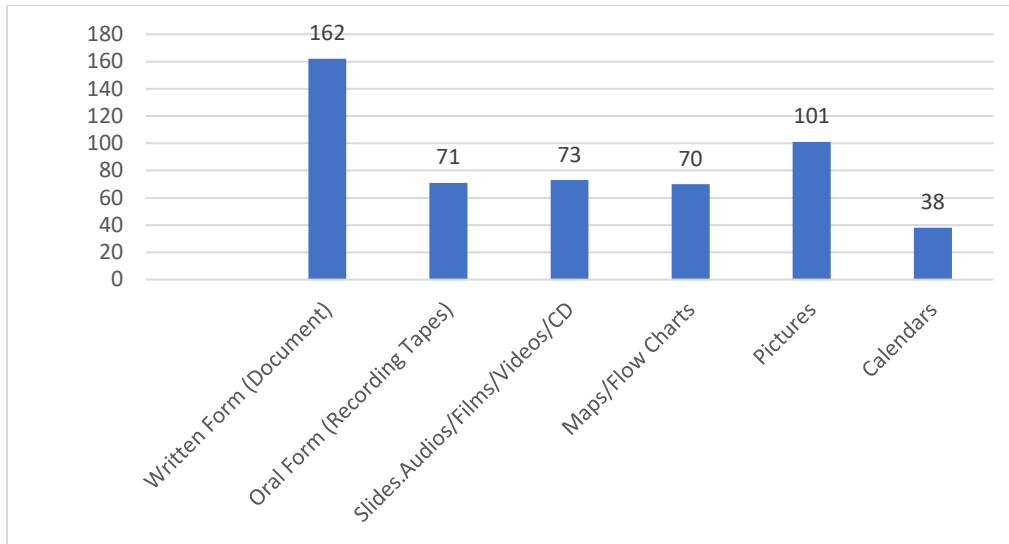
Figure 4.8a: Nature of IK in Library's Collection
Source: Staff Data, 2019
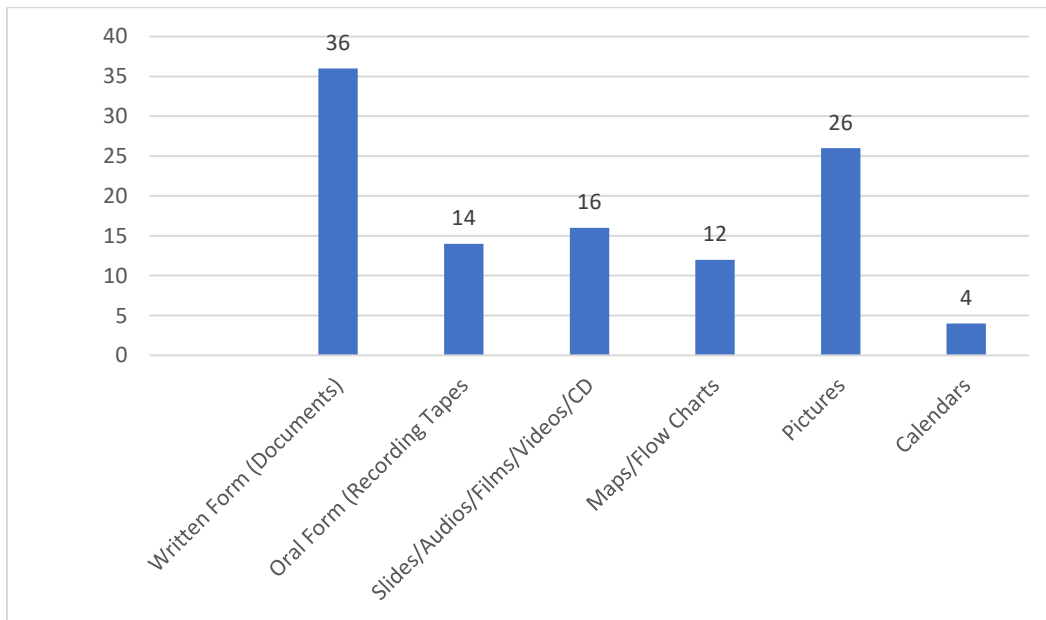
Figure 4.8b: Nature of IK in Library's Collection
Source: Heads of Unit Data, 2019

Figure 4.8a and figure 4.8b shows that respondents from both categories indicated various forms of IK in their collections amongst which written form (documents) was the largest part of the library's collection (Staff-162 and Heads of Unit-36), followed by pictures-(Staff-101 and Heads of Unit-26), slides/audios/films/videos/CD-(Staff-73 and Heads of Unit-16), oral form/recordings (Staff- 71and Heads of Unit-14), maps/flow charts (Staff- 70 and Heads of Unit-12) and calendars (Staff-38 and Heads of Unit-4). It can be seen that majority of the library's collections were in the written form (documents) while calendars although documented were the least form of material in the library's collection.

4.3.3.4 IK Materials in the Library's Collection

Heads of units were asked whether they have IK materials or resources in their library's collection. In response to this, 35(83.3%) indicated they had IK materials in their collection while 7(16.7%) said they did not have IK materials in their collection. Both categories of respondents were asked to indicate the IK materials they have in their collections and responses are given in table 4.7.

Table 4.7: IK Materials in Library's Collection

IK materials in Library's Collections	Responses			
	Staff N = 180		Heads of Unit N = 42	
	Frequency	Percentage	Frequency	Percentage
Books	169	93.9%	40	95.2%
Diaries/Letters/Journals	112	62.2%	14	33.3%
Genealogies	14	7.8%	4	9.5%
Family Albums	34	22.7%	10	23.8%
Photographs	96	53.3%	24	57.1%
Music	48	26.7%	14	33.3%

Videos	58	32.2%	12	28.6%
Microform	52	28.9%	18	42.9%
Audio/Cassette/CD-ROM	66	36.7%	16	38.1%
History	103	57.2%	22	52.4%
Maps	85	47.2%	20	47.6%
Almanacs	60	33.3%	12	28.6%
Newspaper	127	70.6%	26	61.9%
Magazines	108	60%	14	33.3%
Artefacts	60	33.3%	18	42.9%

Source: Staff and Heads of Unit Data, 2019

Table 4.7 shows the various forms of IK materials in the library's collections. Among the various materials respondents indicates books-(staff- 93.9% and heads of unit-95.2%), newspapers-(staff-70.6% and heads of unit-61.9%), dairies/letters/journals-(staff-62.2% and heads of unit-33.3%), microform-(staff-28.9% and heads of unit-42.9%), genealogies-(staff-7.8% and heads of unit-9.5%). It can be seen that there were various forms of IK materials in the library's collection, but the majority of these materials are books which shows high responses for both staff and heads of unit.

After indicating the various IK materials, they have in their collections, heads of units were asked whether they had taken any measures in the recognition of IK. Out of the 42 respondents, 15(35.7%) indicated yes, 20(47.6%) said they had not taken any necessary measures towards the recognition of IK while the rest 7(16.7%) gave a no response.

4.3.3.5 Frequency of Use of IK Materials in Library's Collection

Respondents were further asked to indicate the frequency of use of IK materials in their collections and from table 4.8, it can be seen that books-(66.1%) were frequently used. Majority of the respondents also indicated that they never used videos-(90%), Family albums-(68.9%) and genealogies-(68.3%) at the library. These were the responses of staff.

For the heads of units, it was seen that newspaper-(47.6%) was used frequently while videos-(52.4%), music-(47.6%) and microform (42.9%) were used occasionally.

Table 4.8: Frequency of Use of IK Materials in Library's Collection

IK materials in Library's Collections	Frequency of Usage					
	Responses					
	Staff			Heads of Unit		
	Frequency (Percentage) *N = 180*			Frequency (Percentage) *N = 42*		
	Never	Occasionally	Frequently	Never	Occasionally	Frequently
Books	8(4.4)	20(11.1)	119(66.1)	N/A	10(23.8)	12(28.6)
Diaries/Letters/Journals	45(25)	35(19.4)	46(25.6)	26(61.9)	8(19.0)	4(9.5)
Genealogies	123(68.3)	18(10.0)	5(2.8)	32(76.2)	6(14.3)	N/A
Family Albums	124(68.9)	15(8.3)	7(3.9)	34(81.0)	4(9.5)	N/A
Photographs	41(22.8)	43(23.9)	12(6.7)	8(19.0)	14(33.3)	6(14.3)
Music	67(37.2	28(15.6)	15(8.3)	15(35.7)	20(47.6)	2(4.8)

Videos	90(50.0)	18(10.0)	11(6.1)	9(21.4)	22(52.4)	2(4.8)
Microform	78(43.3)	41(22.8)	9(5.0)	N/A	18(42.9)	2(4.8)
Audio/Cassette/CD-ROM	57(31.7)	34(18.9)	16(8.9)	N/A	21(5.0)	5(11.9)
History	14(7.8)	23(12.8)	77(42.8)	N/A	14(33.3)	5(11.9)
Maps	20(11.1)	46(25.6)	28(15.6)	10(23.8)	8(19.0)	N/A
Almanacs	20(11.1)	48(26.7)	25(13.6)	N/A	14(33.3)	N/A
Newspaper	10(5.6)	20(11.1)	91(50.6)	N/A	10(23.8)	20(47.6)
Magazines	15(8.3)	40(22.2)	72(40.0)	N/A	6(14.3)	12(28.6)
Artefacts	46(25.6)	31(17.2)	21(11.7)	N/A	12(28.6)	N/A

Source: Staff and Heads of Unit Data, 2019

4.3.3.6 Level of IK Resources/Materials in Library's Collections

It was very important for the purposes of the study to know the level of use of IK materials in the library's collections. The various levels were either for research purposes, instructional materials for teaching and learning or they are part of the general collections of the library which are acquired in general for general or basic information.
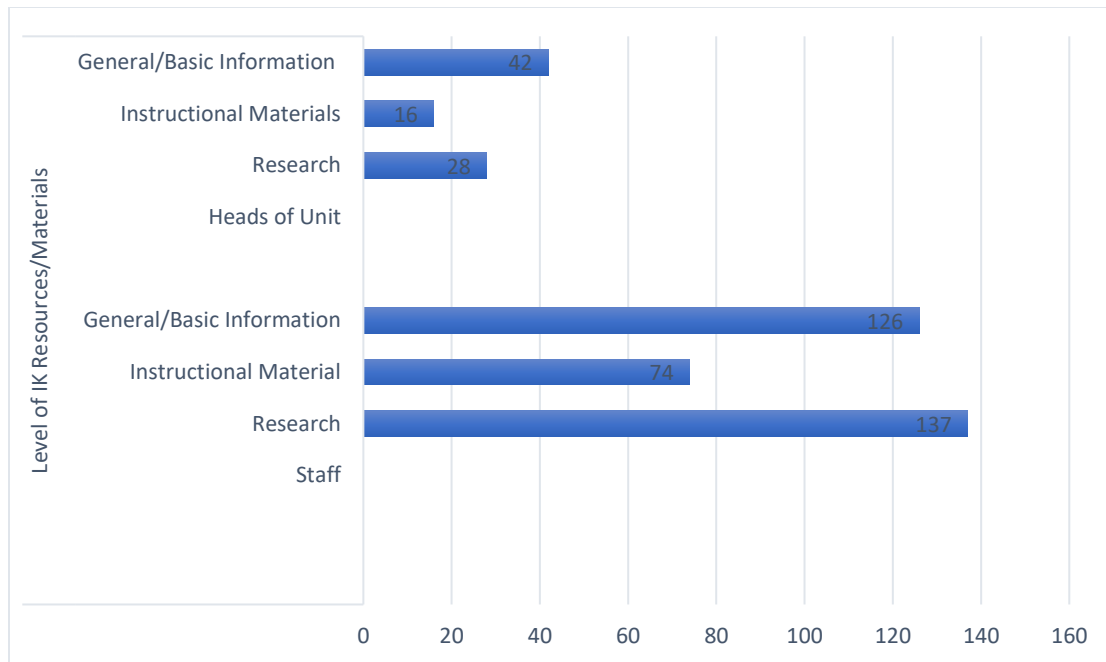
Figure 4.9: Level of IK Resources/Materials in Library's Collections
Source: Staff and Heads of Unit Data, 2019

Figure 4.9 shows that majority-137(76.1%) indicated that the level of use of IK materials in their collection was for research purposes while 126(66.7%) indicated it was to provide general/basic information for users and 74(41.1%) indicated that it was instructional materials. Responses from heads of units shows similar trends. All-42(100%) indicated they were for general/basic information while 28(66.7%) indicated they were for research and 16(38.1%) indicated they were instructional materials.

4.3.3.7 Rationale for Documenting IK

Staff were further asked to indicate whether the library has made any effort to document IK. Out of the 180 respondents, 93(51.7%) said they have made efforts to document IK while 87(48.3%) indicated they have not made any effort in documenting IK.

Staff who said they had made efforts to document IK were further asked to give the rationale for the documentation of IK in their libraries. Various responses were given because it was an open-

ended question and responses were coded into themes that were reflective of the various reasons they gave. The responses are presented in figure 4.10 below
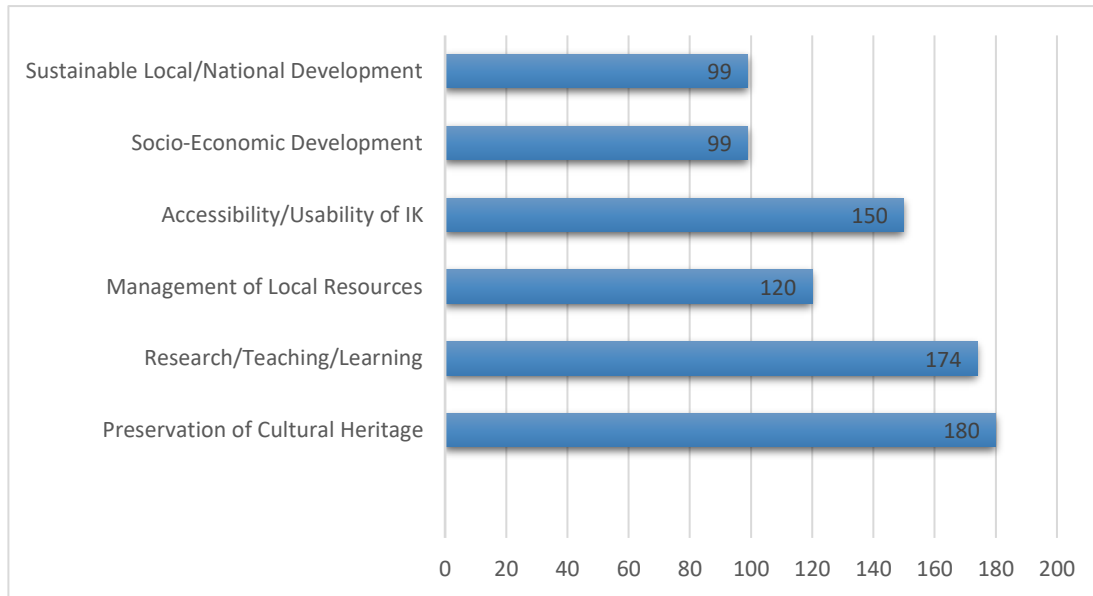
Figure 4.10: Rationale for Documenting IK
Source: Staff Data, 2019

From figure 4.10 180(100%) respondents indicated that the rationale for documenting IK is for the preservation of cultural heritage, research/teaching/learning-174(96.7%), management of local resources-120(66.7%), accessibility/usability of IK-150(83.3%), socio-economic development-99(55%) and 99(55%) indicated the rational was for sustainable local/national development. This shows that staff confirmed the importance of documentation of IK for the preservation of cultural heritage and research/teaching/learning.

4.3.3.8 Unit in Charge of Documenting IK

Managing indigenous knowledge requires one aspect of the process of collection which is documentation. Due to its tacit nature and the mode of documenting and codifying it, it was necessary to find out whether there was any unit in the libraries that are responsible for

documentation. Staff were asked to indicate the unit in charge of the documentation of IK. Amongst the units that were listed by respondents from the various universities are Acquisition-20(11.1%), Cataloguing-15(8.3%), Digitisation-10(5.6%), Special Collection-30(16.7%), Microfilm-15(8.3%), Audio-Visual secion-40(22.2%), Ghana collection-20(11.1%), and Africana-30(16.7%). This is shown graphically in figure 4.11.
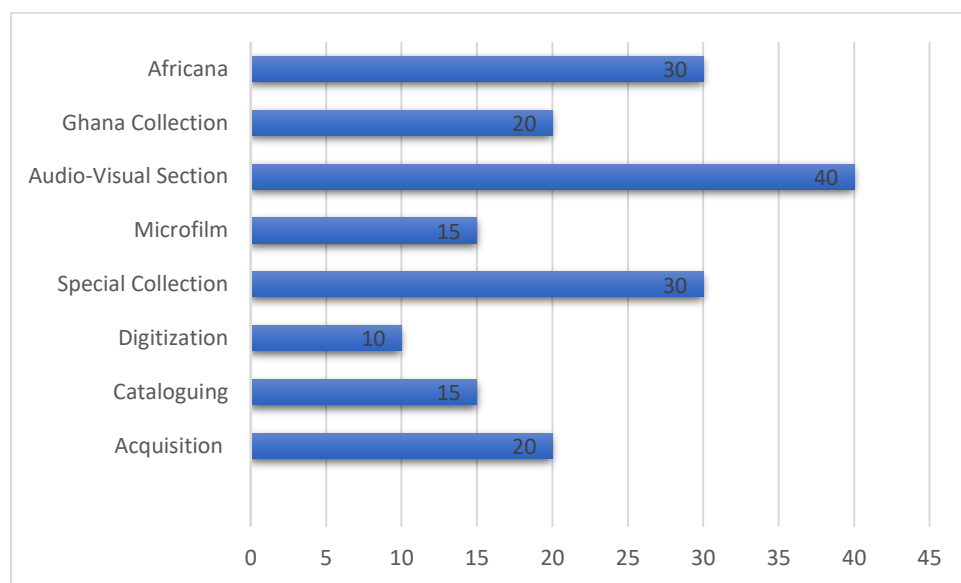
Figure 4.11: Unit in Charge of the Documentation of IK
Source: Staff Data, 2019

4.3.3.9 Benefits of Indigenous Knowledge

Indigenous knowledge has enormous benefits by providing socio-cultural information necessary for communities local, environmental, geographical and cultural context especially in relation to knowledge practices and rituals pertaining to agriculture, health care, food preparation, education, natural resource management amongst others within communities and culture (Warren 1991; Grenier 1998; World Bank 1998; Ellen & Harris 2000; Chisenga 2002; Ngulube 2002; Mascarenhas 2004; United Nations 2006; Masango 2010; Tharakan 2015:52-53). Staff were asked to indicate the ways in which indigenous knowledge has benefitted them. The responses are illustrated in figure 4.12.
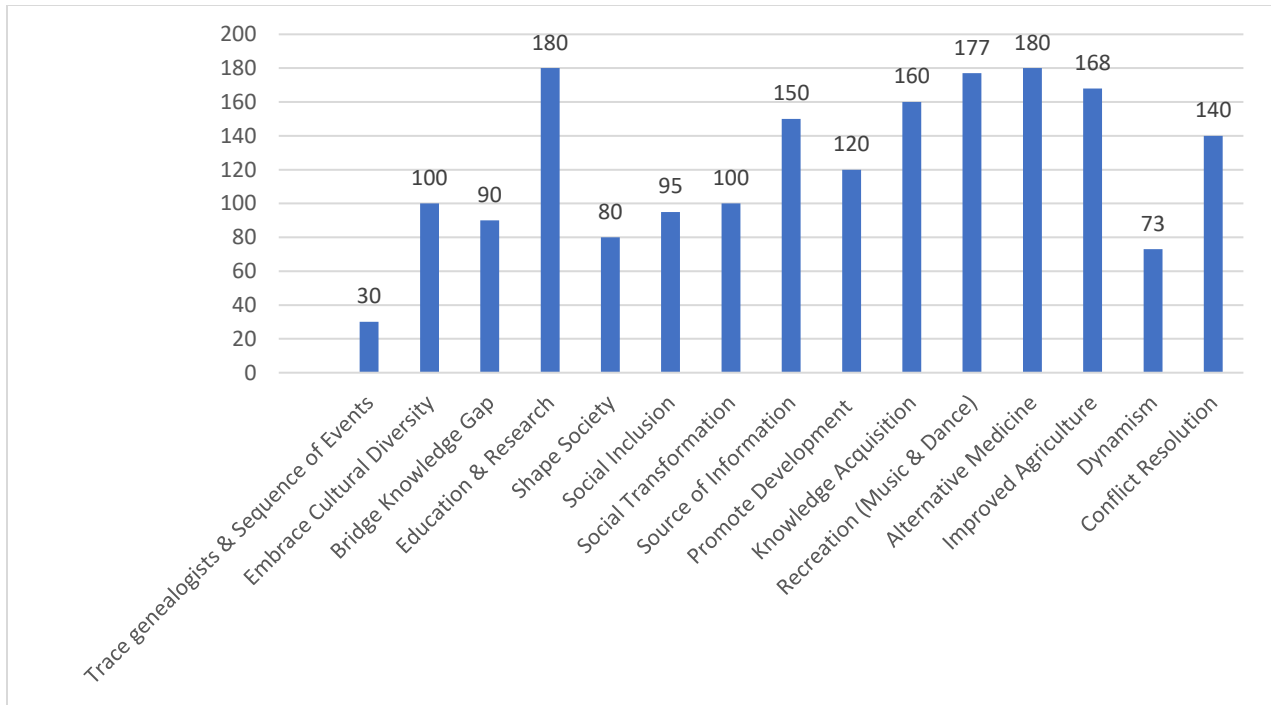
Figure 4.12: Benefits of Indigenous Knowledge
Source: Staff Data, 2019

Amongst the benefits of IK, Staff indicated Education and Research-180(100%), Alternative Medicine-180(100%), Recreation(Music & Dance)-177(98.3%), Improved Agriculture-168(93.3%), Knowledge Acquisition-160(88.9%), Source of Information-150(83.3%), Conflict Resolution-140(77.8%), Promote Development-120(66.7%), Social transformation-100(55.5%), Embrace Cultural Diversity-100(55.5%), Social Inclusion-95(52.8%), Bridge Knowledge Gap-90(50%), Shape Sciety-80(44.4%) Dynamism-73(40.6%) and Trace genealogies and sequence of Events-30(%). This indicates that indigenous knowledge has many benefits in the different aspects of life and in society in general.

4.3.4 POLICIES AND FRAMEWORKS GOVERNING THE MANAGEMENT OF INDIGENOUS KNOWLEDGE

Policies are pivotal in the recognition and documentation of indigenous knowledge (Sithole 2007:120). Policies are vital and ensures that structures appropriate for the management and

preservation of IK are enacted if properly enforced. It is the only way through which indigenous communities can realise their full potential in the society (Mangena 2005). Since libraries acquisitions and collections are based on their collection development policies, questions on policies was asked to be sure whether the institutions had any policy that cater for the management of indigenous knowledge within their respective universities and whether those policies were operational.

4.3.4.1 Policies Governing the Management of IK: Heads of Units

Respondents were asked if there were any policies that governs the operation of their units. Out of the 42 respondents, 14(33.3%) indicated there were policies governing the operation of their respective units while 28(66.7%) said they had no policies. The researcher further asked those who indicated they had a policy whether the policy catered for the management of IK. In response, 36(85.7%) were negative while 6(14.3%) responded positively. Respondents were further asked whether they were aware of any national policy that mandates the library to collect and manage IK and all respondents indicated they were not aware of a policy as such.

4.3.4.2 Policies governing the management of IK: Staff

Staff were asked whether their libraries have a collection development policy and whether the policy catered for the management of IK. Out of the 180 respondents, 139(77.2%) said they have a collection development policy while 41(22.8%) stated they did not have a collection development policy. As to whether an aspect of the policy catered for the management of IK, 110(61.1%) said yes and 70(38.9%) said no aspect of the policy catered for the management of IK. Staff were further asked whether they think government policy will ensure the effective management of IK. From the responses that were given, 107(59.4) said government policies will ensure the effective management of IK while 73(40.6%) were negative.

4.3.4.3 Level of agreement with the effective management, preservation and protection of IK

Respondents were asked to indicate their level of agreement concerning the effective management, preservation and protection of IK. The responses indicate high level of agreement with the statements (1-5) in table 4.8. Respondents agreed that the management of IK will be effective if it is supported and backed by legislation with a mean (M) of 4.04 and a standard deviation (SD) of 1.179 for Staff and M=4.33 and SD=0.786 for Heads of Units showing high levels of agreement for statement 1. Statement 2 states that communities should manage their own IK in order to protect it with M=3.42 and SD=1.242 for Staff and M=3.62 and SD=1.513 for Heads of Unit showing that respondents agree with the statement. However, although respondents agreed to statement 2, there were variations in the responses because the standard deviation was close to the mean with figures above 1. The mean and standard deviation for respondents from statement 3 to 5 shows a good level of agreement that libraries should be proactive to partner with communities to manage to manage IK and that the management of IK and its protection calls for the participation from all stakeholders.

Table 4.9: Level of Agreement with the effective Management of IK

Agreement with the effective management of IK	Staff					Heads of Unit				
	Frequency	Minimum	Maximum	Mean	Standard Deviation	Frequency	Minimum	Maximum	Mean	Standard Deviation
1. The management of IK will be effective if it is supported and backed by legislation from government	180	1	5	4.04	1.179	42	2	5	4.33	0.786
2. Communities should manage their own IK in order to protect it	180	1	5	3.42	1.242	42	1	5	3.62	1.513
3. Libraries should be proactive to partner	180	1	5	3.93	1.199	42	2	5	4.57	0.737

with communities to manage and preserve IK										
4. Libraries are mandated to partner with communities to manage and preserve IK	180	1	5	3.52	1.226	42	1	5	4.19	1.153
5. The management and preservation of IK and its protection from overexploitation calls for participation from all stakeholders	180	1	5	3.85	1.226	42	3	5	4.62	0.582

Source: Staff and Heads of Unit Data, 2019

4.3.5 LIBRARY PROGRAMMES AND SERVICES

Library programmes and services are the activities that libraries undertake to serve their users in order to satisfy their information needs. Mhlongo and Ngulube (2019:3) explains it to encompass all the services of the library ranging from circulation, referencing, inter-library loans, information searches and current awareness services to outreach programmes.

The researcher sought to find out whether the libraries had any programmes or services to serve indigenous communities and in addition whether there was any collaboration between the libraries and indigenous communities to collect, document and manage their indigenous knowledge.

4.3.5.1 Programmes for the library to document and manage IK effectively.

Respondents were asked about how the library can document and manage IK effectively. Various responses that were selected shows high level of agreement with the statement with response rates above 70%. In responding to how to document and manage IK effectively, respondents indicated collaborating with indigenous communities to document their IK-(Staff-92.7% and Heads of Unit-95.2%), collaborating with experts in the documentation of IK-(Staff-89.4% and Heads of Unit-

95.2%), assist communities to protect their intellectual asset-(Staff-76.1% and Heads of Unit-90.5%), make available and promote information resources on indigenous knowledge-(Staff-90.6% and Heads of Unit-100%), publicize the value of IK to patrons- (Staff-81.7% and Heads of Unit-100%), and encourage the recognition of intellectual property rights on the use of IK-(Staff-88.3% and Heads of Unit-85.7%) as ways in which libraries can document and manage IK effectively. The responses are illustrated in table 4.9.

Table 4.10: Programmes for the library to document and manage IK effectively

Programmes	Responses			
	Staff (N=180)		Heads of Unit (N=42)	
	Frequency	Percentage	Frequency	Percentage
1. Collaborating with indigenous communities to document their IK	167	92.7%	40	95.2%
2. Collaborating with experts in the documentation of IK	161	89.4%	40	95.2%
3. Assist communities to protect their intellectual asset (IK)	137	76.1%%	38	90.5%%
4. Make available and promote information resources on indigenous knowledge	163	90.6%%	42	100%
5. Publicize the value of IK to patrons	147	81.7%	42	100%
6. Encourage the recognition of intellectual property rights on the use of IK	159	88.3%	36	85.7%

Source: Staff and Heads of Unit Data, 2019

4.3.5.2 Strategies the Library can devise to make IK accessible to all.

It is very critical to understand the strategies that libraries can devise to make IK available and accessible. Respondents were asked to indicate the strategies the library can devise to make IK accessible to all from options provided and to select as many options that may be applicable. The responses are shown in table 4.11.

Table 4.11: Strategies the library can devise to make IK accessible to all

Strategies	Responses			
	Staff (N=180)		Heads of Unit (N=42)	
	Frequency	Percentage	Frequency	Percentage
1. Preparing inventories and registers of indigenous knowledge systems	118	65.6%	34	80.9%%
2. Developing collection development polices	155	86.1%	40	95.2%
3. Developing standardized tools for indexing and abstracting	130	72.2%	34	80.9%
4. Publicity of IK resources and its importance	161	89.4%	40	95.2%
5. Compiling bibliographies of IK resources	157	87.2%	40	95.2%

Source: Staff and Heads of Unit Data, 2019

From table 4.10 respondents indicated preparing inventories and registers of indigenous knowledge systems-(Staff-65.6% and Heads of Units-80.9%), developing collection development policies (Staff-86.1% and Heads of Unit-95.2%), developing standardized tools for indexing and abstracting (Staff-72.2% and Heads of Unit-80.9%), publicity of IK resources and its importance (Staff-89.4% and Heads of Unit-95.2%) and compiling bibliographies of IK resources (Staff-87.2% and Heads of Unit-95.2%).

4.3.5.3 Role of Information Professionals in Managing IK

Information professionals have an important role to play in relation to managing indigenous knowledge through the processes of documentation, providing accessibility, ensuring dissemination and publicity to all groups of people (users both indigenous and non-indigenous) whilst protecting IK against exploitation and encouraging the acknowledgement of intellectual property rights (IFLA 2012; Ngulube 2002:99). Amongst the various roles that information professionals can undertake to manage IK include developing collection development policies-(Staff-93.3% and Heads of Unit-95.2%), collecting IK (Staff-83.3% and Heads of Unit-100%), recording and documentation-(Staff-80.6% and Heads of Unit-95.2%), organising IK resources-(Staff-80%and Heads of Unit-100%), preservation and storage-(Staff-87.8% and Heads of Unit-100%), networking with stakeholders-(Staff-63.9%and Heads of Unit-90.5%), dissemination of IK resources-(Staff-83.3% and Heads of Unit-95.2%), access management-(Staff-70.6%and Heads of Unit-95.2%),publicizing and promoting the importance of IK-(Staff-87.8% and Heads of Unit-100%) and protection of intellectual property rights--(Staff-78.9% and Heads of Unit-85.7%). The responses show that information professionals have various roles to play in the management of indigenous knowledge and this starts from the first stage of collecting right to its preservation and protection against overexploitation.

Table 4.12: Role of information professionals in managing IK

Role of information professionals	Responses			
	Staff (N=180)		Heads of Unit (N=42)	
	Frequency	Percentage	Frequency	Percentage
1. Developing collection development policies	168	93.3%	40	95.2%
2. Collection of IK	150	83.3%	42	100%
3. Recording and documentation	145	80.6%	40	95.2%
4. Organizing IK resources	144	80%	42	100%
5. Preservation and storage (different media) of IK	158	87.8%	42	100%
6. Networking with stakeholders	115	63.9%	38	90.5%
7. Disseminating IK resources	150	83.3%	40	95.2%
8. Access Management	127	70.6%	40	95.2%
9. Publicizing and promoting the importance of IK resources	158	87.8%	42	100%
10. Protection of Intellectual Property Rights	142	78.9%	36	85.7%

Source: Staff and Heads of Unit Data, 2019

4.3.5.4 In what form can IK be documented?

To ensure the continued accessibility and preservation of indigenous knowledge is by means of documentation (Mhlongo 2018:46; Lwoga & Ngulube 2009;). It is thus relevant to document it in

a form that can be readily usable and accessible to those who may need it for varied purposes. Against this background, participants were asked to indicate the form in which IK can be documented. Responses are illustrated in figure 4.13.
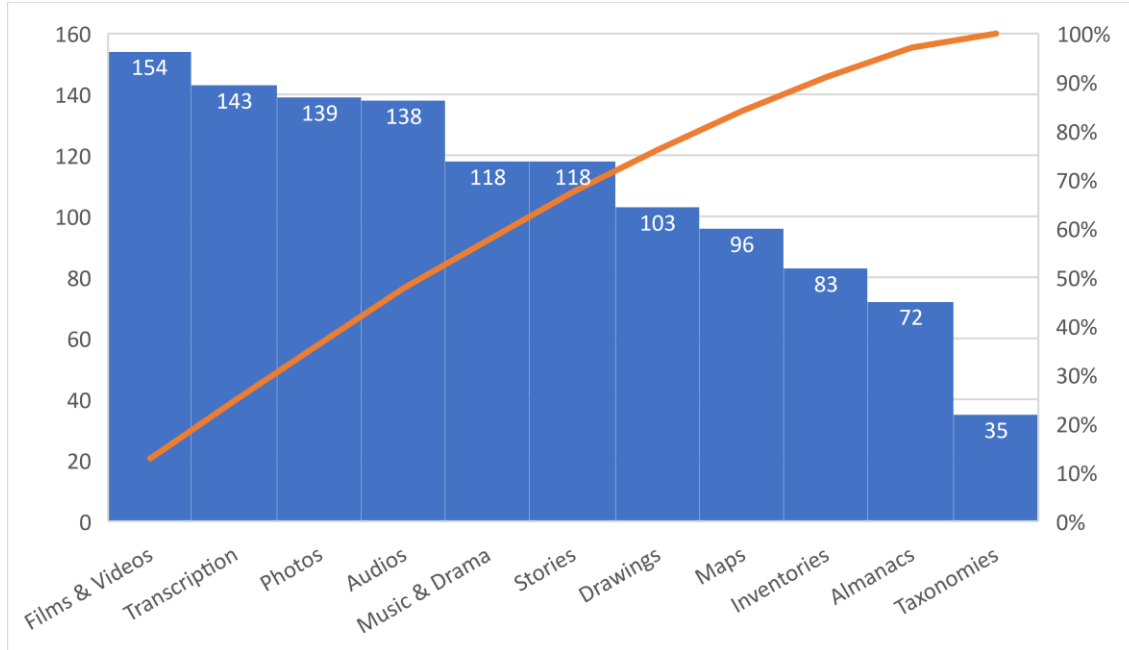
Figure 4.13: Form to Document IK
Source: Staff Data, 2019

From figure 4.13, majority-154(85.6%) indicated films and videos. The other form that was selected by participants were, transcription-143(79.4%), photos-139(77.2%), audios-138(76.7%), music and drama-118(65.6%), stories-118(65.8%), drawings-103(57.2%), maps-95(52.8%), inventories-83(46.1%), almanacs-72(40%) and taxonomies-35(19.4%). The responses show that due to the nature of IK, participants saw films and videos as the simplest form of documentation

4.3.6 INTEGRATION OF IK INTO LIBRARY'S SERVICES

For libraries to integrate any services or product into their existing services, the product or services must be something that will be useful and productive for users. Based on this premise respondents were asked whether they considered IK as an intellectual asset. The responses are presented in

Figure 4.14 shows that majority of respondents-(Staff-148, 82.2% and heads of units-35, 83.3%) see IK as an intellectual asset.
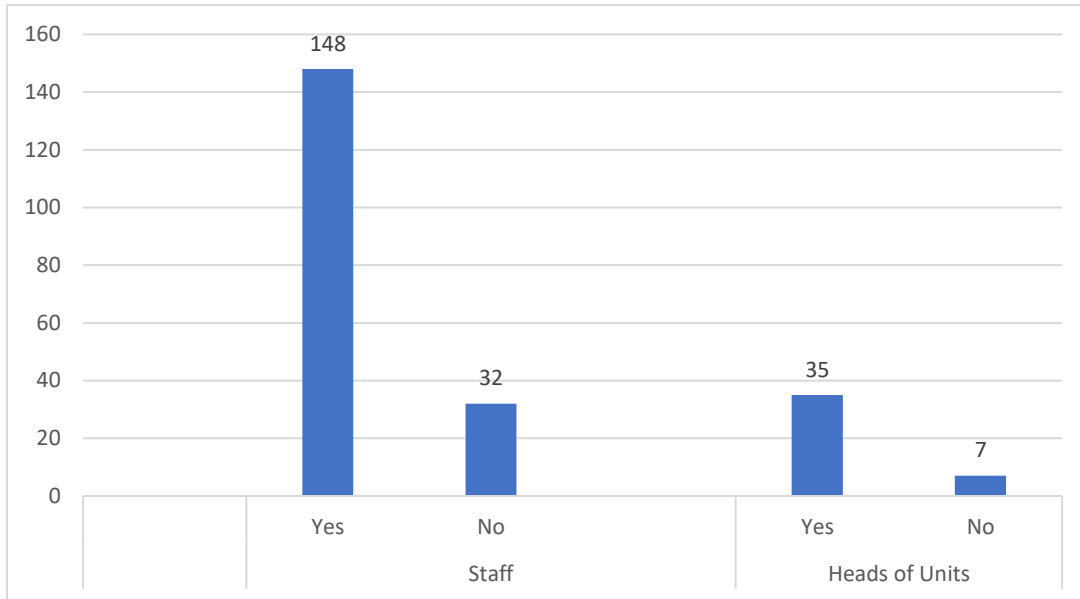
Figure 4.14: Is IK an Intellectual Asset?
Source: Staff and Heads of Unit Data 2019

4.3.6.1 Why IK is an Intellectual Asset

Respondents who considered IK as an intellectual asset were further asked to give reasons why they think so. Respondents gave various reasons amongst which include informal education-180(77.9%), preservation of cultural heritage-160(69.3%), shape society-130(56.3%), research purposes-170(73.6%), knowledge acquisition-100(43.3%), source of information-98(42.4%), and promote development-80(34.6%). The responses are presented in figure 4.15.
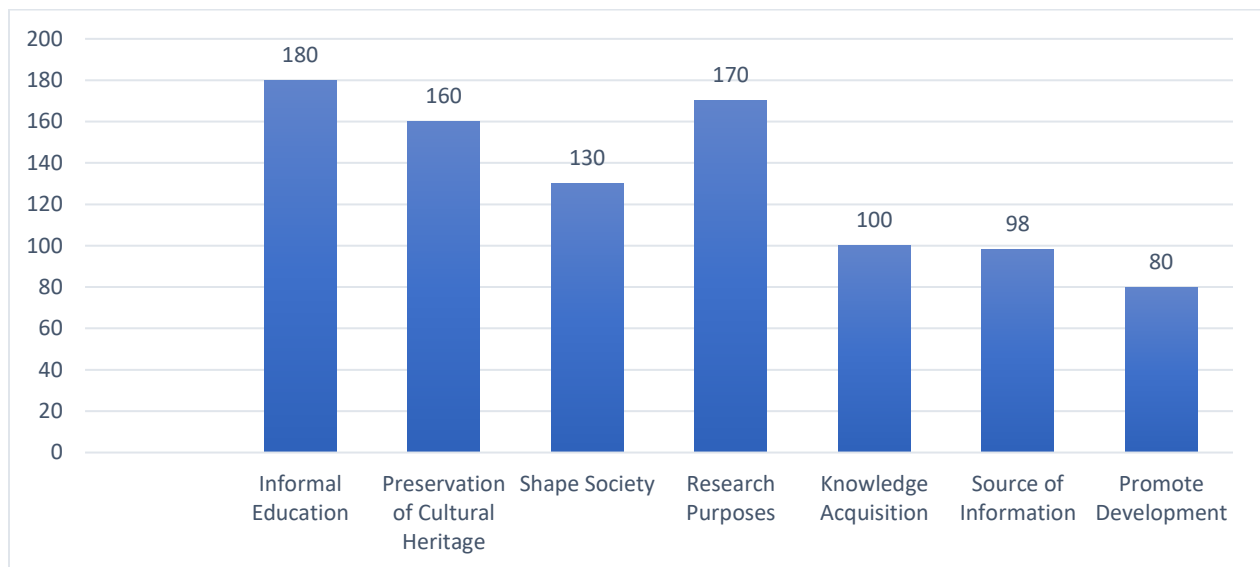
Figure 4.15: Why IK is an Intellectual Asset
Source: Staff and Heads of Unit Data, 2019

4.3.6.2 Representation of IK Materials in Library's Collection

Respondents were asked whether IK materials are well represented in the library's collection. With regards to this, 82(45.6%) indicated that IK materials are well represented in their collection while 98(54.4%) said they are not well represented in their library's collection.

Respondents were further asked to explain the reason for their yes or no response and this is illustrated in the table 4.12. Respondents who indicated that IK materials were well represented in their library's collection gave reasons such as research/teaching/learning purposes, intellectual asset and preservation of cultural heritage. Participants who gave a no responses gave reasons such as IK not the focus of library's collection, IK not covered by the university's curriculum and the fact that they only manage documented information in the libraries.

Table 4.13: Representation of IK Materials in Library's Collection

Representation of IK materials in Library's Collection	Responses Frequencies (Percentage) and Reasons	
	Yes	**No**
	Frequencies (Percentage)	**Frequencies (Percentage)**
	82(45.6%)	98(54.4%)
Reasons		
Reasons	1. Research/Teaching/Learning	1. Not the focus of Libraries Collection
	2. Intellectual Assert	2. Not Covered by the University Curriculum
	3. Preservation of Cultural Heritage	3. We manage only documented information

Source: Staff Data, 2019

4.3.6.3 Provision of Access to IK Materials

A followed-up question was asked on whether the library provides access to IK materials in the Library. The responses are provided in table 4.13. Options were given to respondents to indicate how they provide access to IK materials in the library. From the responses, majority-(Staff-78.9% and Heads of Unit-90.5%) said they catalogue and shelve IK materials, provision of online access through databases (Staff-56.1% and Heads of Unit-76.2%), prepare finding aids for IK materials (Staff-47.85% and Heads of Unit-47.6%), network to share IK resources with other institutions (Staff- 32.2% and Heads of Unit-42.9%), use bibliographies (Staff-50.1% and Heads of Unit-47.6%), index and abstracts (Staff-42.2% and Heads of Unit-47.6%).

Table 4.14: Provision of Access to IK Materials

Provision of Access	Responses			
	Staff (N-180)		Heads of Unit (N=42)	
	Frequency	Percentage	Frequency	Percentage
1. We catalogue and shelve IK materials	142	78.9%	38	90.5%
2. We provide online access through databases	101	56.1%	32	76.2%
3. We prepare finding aids for IK materials	86	47.8%	20	47.6%
4. We network to share IK resources with other institutions (consortia)	58	32.2%	18	42.95
5. We use bibliographies	95	50.1%	20	47.6%
6. We use index and abstracts	76	42.2%	20	47.6%

Source: Staff and Heads of Unit Data, 2019

4.3.7 STAFF TRAINING PROGRAMMES ON IK

Staff trainings are done to provide staff with the necessary skills to conduct their work. This comes in various forms through workshops, seminars and in-service trainings normally called continuous professional development programmes that are done to equip staff on their daily routines and activities at work and also to update their knowledge and skills on the evolving and emerging trends in the profession.

4.3.7.1 Training Programmes on IK

Heads of units were asked whether they have designed any programme to train staff on the management of IK. In response, 20(47.6%) indicated they had no training programmes on the management and preservation of IK while 5(11.9%) said they had a training programmes, 17(40.5%) gave a no response for the heads of unit category. Respondents who indicated yes were asked to indicate the key focus areas on such trainings. Only 10(23.8%) of the respondent indicated that the focus of such training was on the preservation of information in different formats.

With the staff category, 149(82.8%) indicated that they had no training on the management of IK while 26(14.4%) indicated they have had training on IK. However, when further asked to indicate the focus of such trainings, none of the respondents in the staff category answered the question.

4.3.8 TOOLS AND EXPERTISE NEEDED FOR THE MANAGEMENT OF IK

The management of IK require certain tools for collection or documentation and requisite skills and expertise for documenting, managing and preserving information in such form.

Respondents were asked whether they have the requisite expertise and tools to document and manage IK. Out of the 42 respondents, 10(23.8%) indicated they had the tools, 20(47.6%) indicated they do not have the tools and expertise while 12(28.6%) gave a no response to the question. They were further asked whether the library is equipped to render services to indigenous communities in terms of the management of indigenous knowledge and 20(47.8%) said they weren't equipped to render such services in terms of the management of IK while 7(16.7%) said they had the skills and expertise to do so. The rest gave a no response to the question.

To find out whether respondents have the skills and expertise needed for the management of IK, respondents were asked to indicate their level of competency in certain skills required for managing IK effectively. Within a range of 1 to 5 from poor to excellent, respondents indicated

their level of competency in various aspects and skills that are necessary for the entire management, preservation, access and dissemination of indigenous knowledge.

Responses from both Staff and Heads of Units are represented in table 4.15.

Table 4.15: Tools and Expertise needed for the Management of IK

Level of Competency	Responses									
	Staff					**Heads of Unit**				
	Frequency	Minimum	Maximum	Mean	Standard Deviation	Frequency	Minimum	Maximum	Mean	Standard Deviation
Computer Literacy	180	1	5	3.81	1.109	42	3	5	4.48	0.594
Digital Literacy	180	1	5	3.03	1.351	42	2	5	3.62	0.909
Media Literacy	180	1	5	2.92	1.262	42	2	5	3.43	0.737
Cultural Awareness	180	1	5	3.16	1.138	42	1	5	3.38	1.011
Oral Traditions	180	1	5	3.06	1.224	42	1	4	2.67	0.786
Documentation	180	1	5	3.14	1.213	42	1	5	3.38	0.962
Transcribing	180	1	5	2.76	1.373	42	1	5	3.05	1.229
Codification	180	1	5	2.48	1.235	42	1	5	2.71	0.891
Translation	180	1	5	2.55	1.387	42	1	5	2.67	1.097
Video/Photo Editing	180	1	5	2.45	1.321	42	1	5	2.57	1.192
Managing Databases	180	1	5	3.18	1.297	42	1	5	3.52	1.065
Digitisation	180	1	5	3.17	1.339	42	1	5	3.33	1.052

	180	1	5	3.36	1.272	42	1	5	3.81	1.153
Preservation Management	180	1	5	3.36	1.272	42	1	5	3.81	1.153
Indexing and Abstracting	180	1	5	3.27	1.259	42	1	5	3.24	1.206
Cataloguing and Classification	180	1	5	3.77	1.163	42	1	5	3.95	1.103

Source: Staff and Heads of Unit Data, 2019

From table 4.15, the Staff responses show that for computer literacy (M=3.81, SD=1.109), cataloguing and classification (M=3.77, SD=1.163) shows high mean values indicating that respondents are very competent in computer literacy, cataloguing and classification. Staff also indicated good level of competency in the area of digital literacy (M=3.03, M=1.351), cultural awareness (M=3.16, SD=1.138), oral traditions (M=3.06, SD=1.224), managing databases (M=3.18, SD=1.297), digitisation (M=3.17, SD=1.339), preservation management (M=3.36, SD=1.272), indexing and abstracting (M=3.27, SD=1.259). With media literacy (M=2.92, SD=1.262), transcribing (M=2.76, SD=1.373), translation (M=2.55, SD=1.387), codification (M=2.48, SD=1.235), video/photo editing (M=2.45, SD=1.321) shows that staff have fair competencies in such areas.

For heads of units the responses are as follows: computer literacy-(M=4.48, SD=0.595), cataloguing and classification-(M=3.95, SD=1.103), preservation management-(M=3.81, SD=1.153), digital literacy-(M=3.62, SD=0.909), managing databases-(M=3.52, SD=1.065) shows very good levels of competency with standard deviations which are low and similar to the mean but there were some variations in responses with variables with a standard deviation of above 1. The rest of the responses indicates that on the average the level of competencies of respondents in media literacy-(M=3.43, SD=0.737), cultural awareness-(M=3.38, SD=1.011), documentation-(M=3.38, SD=0.962), transcribing-(M=3.05, SD=1.229), digitisation-(M=3.33, SD=1.052), indexing and abstracting-(M=3.24, SD=1.206) are good. The competencies of respondents in oral

traditions-(M=2.67, SD=0.786), codification-(M=2.71, SD=0.891), translation-(M=2.67, SD=1.097), video/photo editing-(M=2.57, SD=1.192)-shows a fairly good level of competency.

4.3.9 INDIGENOUS KNOWLEDGE AND SUSTAINABLE DEVELOPMENT

Indigenous knowledge has many benefits and has contributed immensely to development projects globally especially in the area of agriculture, medicine, food safety, cultural identification, skills acquisition, conflict resolution amongst others (Mascarenhas 2004; Nyumba 2006; Sukula 2006; Eyong 2007; Al-roubaie 2010; Dhewa 2011; Chisita 2011; Tharakan 2015; Sarkhel 2016).

Respondents were asked to among options provided indicate the role of IK to development. Responses are given in table 4.16.

Table 4.16: Role of IK to Development

	Responses									
	Staff					Heads of Unit				
Role of IK to Development	Frequency	Minimum	Maximum	Mean	Standard Deviation	Frequency	Minimum	Maximum	Mean	Standard Deviation
1. Education	180	1	5	4.31	0.940	42	1	5	4.43	0.914
2. Agriculture	180	1	5	3.94	1.157	42	1	5	4.52	0.917
3. Medicine	180	1	5	3.93	1.240	42	1	5	4.57	0.914
4. Conflict Resolution and Management	180	1	5	4.09	1.117	42	1	5	4.43	0.966
5. Cultural Identification	180	1	5	4.23	1.002	42	1	5	4.38	1.103
6. Environmental Conservation	180	1	5	4.01	1.131	42	1	5	4.48	0.969
7. Security	180	1	5	3.73	1.194	42	1	5	4.33	0.902

8. Skills Acquisition	180	1	5	3.84	1.084	42	1	5	4.19	1.194
9. Entrepreneurship	180	1	5	3.67	1.227	42	1	5	4.24	1.165

Source: Staff and Heads of Unit 2019 Data

From table 4.16, respondents were asked to indicate the levels of importance they attached to the following developmental areas to IK and the from the responses, heads of units considered education, agriculture, medicine, conflict resolution and management, cultural identification, environmental conservation, security, skills acquisition and entrepreneurship as vital areas to the contribution of IK to development with means (M=4.43, 4.52, 4.57, 4.43, 4.38, 4.48, 4.33, 4.19 and 4.24) figures of above four (4) and standard deviation (SD=0.914, 0.917, 0.914, 0.966, 1.103, 0.969 and 0.902) correspondingly that are similar to the mean indicating that IK plays a very central role in these key areas.

Responses from Staff also indicated the same trend of response corresponding to that of heads of units indicating that IK plays a very important role in education, agriculture, medicine, conflict resolution and management, cultural identification, environmental conservation, security, skills acquisition and entrepreneurship with mean values of (M=4.31, 3.94, 3.93, 4.09, 4.23, 4.01, 3.73, 3.84, 3.67) and standard deviation values of (SD=0.940, 1.157, 1.240, 1.117, 1.002, 1.131, 1.194, 1.084 and 1.227).

Heads of units were also asked if they see any direct relationship between the management of IK and development. This question was directed to heads of unit and in response 37(88.1%) indicated there is a relation while the rest gave a no response. If respondents see a direct relationship between the management of IK and development, they were further asked if in their opinion the management of IK by information professionals will ensure its inclusion in development projects and decision and to explain why they think so. In response, 30(71.4%) indicated yes and the reason given generally was that it will inform stakeholders about the importance of IK and also create awareness to users.

Respondents were again asked whether they think incorporating IK into development projects will ensure sustainability and majority-153(85%) of staff indicated yes while the rest indicated a no response. When further asked to explain reasons for the yes response, the response that was clear and cuts across the few-50(27.8%) who responded was that inclusion of local people in their own community's development will ensure its sustainability.

4.3.10 INDIGENOUS KNOWLEDGE AND INTELLECTUAL PROPERTY RIGHTS

Protection of indigenous knowledge ensures the proper use of tacit knowledge against overexploitation and misappropriation. Intellectual Property Rights encompasses copyright, patents, trademarks and trade secrets (Anderson 2010).

4.3.10.1 Indigenous Knowledge and Intellectual Property Rights: Heads of Unit

To set the tone for delving into issues of intellectual property rights and the management of IK, Staff were asked whether they think IK has any potential value. Responding to the question, 168(93.3%) said IK has a potential value while 12(6.7%) disputed this. Respondents who agreed that IK has a potential value were again asked if there should be an intellectual property law to protect IK. Hundred and fifty-three (153) representing 85% of the respondents affirmed while 27(15%) said there should be no intellectual property law. Staff were again asked according to options given to indicate what intellectual property law should be applied to protect IK materials. The responses are represented in figure 4.16 below.
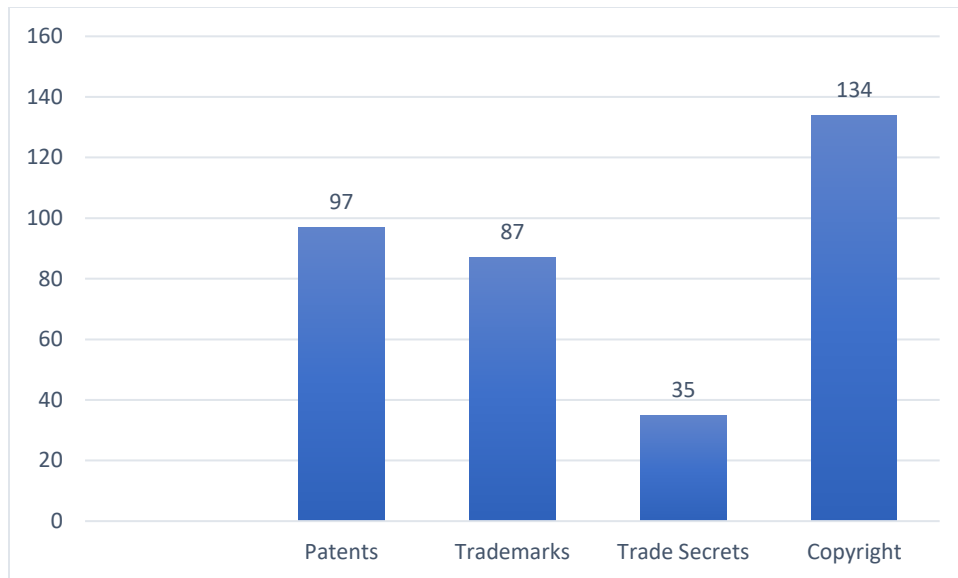
Figure 4.16: Intellectual Property Laws
Source: Staff Data 2019

From figure 4.16, 134(74.4%) indicated copyrights, 97(53.9%)-patents, 87(48.3%)-trademarks and 35(19.4%)-trade secrets as intellectual property rights that should be applied to the use and management of indigenous knowledge. This implies that majority-74.4% believe copyright is the best intellectual property right to apply to the use and management of indigenous knowledge.

As a follow-up question, respondents were asked whether they considered intellectual property laws as a limitation to the use of IK globally. In response, 130(72.2%) indicated that applying intellectual property laws will not limit the use of IK while 50(27.8%) said it will limit the use of IK globally. Participants were again asked to give the reason for their responses to why or why not applying intellectual property laws will limit the use of IK. Respondents gave varying opinions to the yes and no choices which is represented in figure 4.17.

Apply Intellectual Property Law   No Intellectual Property Law

☐ Promote the use of IK   ☐ Limit the use of IK

☐ Financial Benefits to owners of IK   ☐ Difficulty to enforce IP laws

☐ Prevent Overexploitation of IK   ☐ Risks of Lawsuit

Figure 4.17: Should Intellectual Property Law be applied on IK?

From figure 4.17, respondents who insisted on applying intellectual property law gave reasons such as financial benefits to owners of IK, promote the use of IK and prevent overexploitation of IK. Respondents who said there should be no intellectual property law also gave reasons such as the difficulty to enforce intellectual property laws, risks of lawsuit and limit to the use of IK. All these responses show that although applying IP laws are good measures to protect indigenous knowledge and its owners, it is important to also look at its limitation and come up with measures that will be beneficial to owners of such knowledge system.

4.3.11 INFORMATION COMMUNICATION TECHNOLOGIES AND INDIGENOUS KNOWLEDGE SYSTEMS

Information communication technologies (ICTs) are one of the most effective and appropriate tools to capture (recording, films/videos, photos, digitisation etc.) indigenous knowledge in different aspects and fields. They are also very effective in disseminating tacit knowledge globally (Dlamini and Ocholla 2018; Chisita 2011; Lwoga 2009; Okore, Ekere & Eke 2009). Questions on the use of ICTs were embedded in most of the sections and will be thorough discussed in the next chapter.

4.3.12 CHALLENGES TO THE MANAGEMENT OF INDIGENOUS KNOWLEDGE BY INFORMATION PROFESSIONALS

A lot of challenges come with managing information of this nature and form in academic institutions especially if its collection is not a core part of the library's collection and core mandate. Challenges such as lack of resources to collect and manage IK. Most especially, the very nature of indigenous knowledge comes with its own challenges.

Respondents were therefore asked to select as many options that were applicable to them what they see as a challenge to the management of indigenous knowledge by information professionals. The responses are shown in table 4.17.

Table 4.17: Challenge to the Management of IK by Information Professionals

Challenges	Responses			
	Staff (N=180)		Heads of Unit (N=42)	
	Frequency	Percentage	Frequency	Percentage
1. IK not part of University curriculum	119	66.1%	30	71.4%
2. Recognition of the kind of IK to collect	117	65.0%	34	80.9%
3. Lack of validation of IK	108	60.0%	36	87.5%
4. Lack of expertise to collect oral traditions	139	77.2%	40	95.2%
5. Language barrier in collecting IK	131	72.7%	38	90.5%

6. Lack of tools and/or equipment for documentation	126	70%	38	90.5%
7. Lack of documentation strategy	110	61.1%	32	76.2%
8. Funding constraints	141	78.3%	40	95.2%
9. Lack of interest by information professionals to collect IK	102	56.7%	32	76.2%
10. Lack of resources	135	75.0%	34	80.9%
11. Lack of technical staff	122	81.3%	38	90.5%
12. Inadequate ICT infrastructure	112	62.2%	32	76.2%
13. Lack of staff training	143	79.4%	40	95.2%
14. Intellectual Property Rights	91	50.6%	34	80.9%
15. Lack of collaboration among various stakeholders	143	79.4%	38	90.5%
16.No policy mandates libraries to collect and manage IK	134	74.4%	40	95.2%

Source: Staff and Heads of Unit Data, 2019

From table 4.17, the responses of participants indicated that a lot of challenges comes with the management of IK by information professionals amongst which include no policy that mandates libraries to collect and manage IK-(Staff-74.4% and Heads of Unit-95.2%), IK not part of

university curriculum-(Staff- 66.1% and Heads of Unit-71.4%), recognition of the kind of IK to collect-(Staff-60% and Heads of Unit-80.9%), lack of validation of IK-(Staff-60% and Heads of Unit-87.5%), lack of expertise to collect oral traditions-(Staff- 77.2% and Heads of Unit-95.2%), language barrier in collecting IK-(Staff-72.7% and Heads of Units-90.5%), lack of tools/equipment for documentation-(Staff-70% and Heads of Unit-90.5%), lack of documentation strategy-(staff-61.1% and heads of unit-76.2%), funding constraints-(Staff-78.3% and Heads of Unit-95.2%), lack of interest by information professionals to collect IK-(Staff-56.7% and Heads of Unit-76.2%), lack of resources-(Staff-75% and Heads of Unit-80.9%), lack of technical staff-(Staff-81.3% and Heads of Unit-90.5%), inadequate ICT infrastructure-(Staff-62.2% and Heads of Unit-76.2%) lack of staff training-(Staff-79.4% and Heads of Unit-95.2%), intellectual property rights-(Staff-50.6% and Heads of Unit-80.9%) and lack of collaboration among various stakeholders-(Staff-79.4% and Heads of Unit-95.2%).

4.4 QUALITATIVE FINDINGS

The qualitative findings are presented according to the themes that were developed from the research questions. University librarians were the main respondents, and they were interviewed by the researcher. Some aspects of the qualitative findings were through observations and document analysis where applicable. These provided the researcher with important qualitative data. The interview questions were conducted purposely (see attachment in the Appendix) for the University Librarians. Although the presentations of the qualitative findings were presented under themes, some of the questions might have been answered under one theme and it so was a challenge to extract them and classify them under a different theme and so they were consequently left as such. Some participants did not answer some of the question so in that case there was no response by such participants so in that case there was no response by such participants under a particular theme. Responses that cut across all participants were discussed in aggregate to avoid repetition. The researcher did not consider the demographics of the interviewees important in this category of respondents and so they were not solicited for. For the purposes of confidentiality and anonymity, interviewees were classified as participant A to I, representing the nine (9) respondents who granted the interview with the researcher.

For the purposes of achieving the objective of the study, the responses from the interviewees were categorised under themes and given selective codes. These selective codes were generated from the responses that were given by the participants.

Table 4.18: Coding responses under themes to generate data for analysis

Themes		Selective codes
1	Strategic goals of university libraries	Customer Excellence
		Technology Enhanced Learning
		Enhancing Research
		Improving Access to Resources
		Support teaching/leaning/research
		Develop and provide access to resources
2	Units/Sections/Departments	Acquisition
		Cataloguing
		Special Collection
		Reference Services
		Technical Services
		ICT support
		Electronic Resources
		Learning and research support
3	Mission, scope and focus of library's collection	Provision of information resources for teaching, learning and research programmes in both print and electronic format
		Support teaching, learning and research

		Collection of resources based on university curriculum
4	Awareness and understanding of IK	Traditional knowledge
		Local knowledge
		Culture
		Community-based knowledge
		Oral traditions
		Culturally relevant knowledge
		Informal knowledge system
5	Policies and frameworks governing the management of IK	Collection Development Policy
		Availability of Collection Development Policy
		Operationalization of Collection Development Policy
		Focus of Collection Development Policy
		National policies on IKS
6	Knowledge organization systems used in the library	Library Management Systems
		Library of Congress
7	Library programmes and services	Outreach Programmes
		Content and focus of outreach programme
		Library and Community Partnership
		Service to indigenous community
		Library Social Responsibilities
8	Integration of IK into library services	Transformation
		Social inclusion

		Equality
		Integration
		Management of IK
		Sustainable development
9	Staff training programmes on IK	Transformation
		Social inclusion
		Integration
		Management of IK
10	Tools and expertise needed for the management of IK	ICT equipment
		Staff competency
11	Indigenous knowledge and education	Transformation
		Social inclusion
		Equality
		Integration
12	Indigenous knowledge and sustainable development	Transformation
		Social inclusion
		Equality
		Sustainable development
13	Indigenous knowledge and intellectual property rights	Patents
		Copyrights
		Trademarks
		Trade Secrets
14	ICTs and indigenous knowledge	Databases
		ICT Infrastructure
		ICT equipment

15	Challenges to the management of IK	Skills and expertise
		Funding
		Lack of interest by information professionals
		IK not part of university curriculum
		Focus of library's collection
		Marginalisation of IK
		Management buy-ins

4.4.1 PROFILE ON THE LIBRARY: UNIVERSITY LIBRARIANS

The University Librarians were asked about the brief history of the library, how long it had been in existence, the strategic goal of the library, the staff capacity and on patrons allowed to use the library and their services. From the responses it was clear that all the university libraries had been in existence since the establishment of the universities and so the libraries were as old as the universities. The university libraries although academic libraries were also deemed technically public libraries of the sort because they were opened to outsiders. However, there were certain restrictions for users who were not registered members of the university. They were allowed to use the resources of the library within the premises, but they had no lending or borrowing rights and also, they were not allowed to use certain sections and services of the library that were accessed only by registered users who were staff, students, research fellows and visiting scholars of the university.

The strategic goals of the university libraries reflected the various things that were happening in the university of which fundamentally was to support teaching, learning and research. Aside of the core strategic goals these were some of the additional goals that the university libraries prioritized.

Table 4.19: Strategic goals and core values of university libraries

Strategic goals and core values
Participant A Customer excellence Technology enhanced learning Improving access to resources
Participant B Providing support to academics Facilitating lifelong learning
Participant C Undertake interdisciplinary research Partnership with stakeholders Promote innovation, creativity, freedom of thought and creative expression
Participant D Partnerships User-focused Ethical considerations Teamwork and visionary leadership Provide innovative services
Participant E Promote knowledge and dissemination of information Offer professional services through extension activities
Participant F Knowledge generation Create and provide resources relevant to national development

Participant G
Facilitate lifelong learning
Advance community and national development
Participant H
Enhance output for national development
Participant I
Provide world-class information resources
Provide innovative services
Advance knowledge through research

Source: University Librarians Data 2019

The libraries had various units that reflected their mandate and activities. The most popular units that cut across all the universities are depicted in figure 4….

Figure 4.18: Units/Sections/Departments in the Library
Source: University Librarians Data 2019

In addition to the very traditional units, some of the universities had additional units to reflect their activities. Participant A stated that…

> "In terms of departmental units within the library, we have recently restructured the library to reflect modern thinking in library service delivery, so we do not have what traditionally most librarians use as a label for units. So, we have units headed by senior members responsible for Collection Development (Print and Electronic, Student Support Services (Reference Services), Academic Engagement and Innovation, ICTs and Systems Department (Looks after all technical infrastructure of the library). Embedded in all these are the things we do traditionally as a library. I wanted job titles that are reflective, not passive and more engaging which users can relate to."

For participant B their library had the formal kind of system like other universities and so they had campuses in different towns. They had two main departments and embedded in these two main departments were units under each section which reflected their activities and services with each unit headed by a senior member. According to participant B…

> "every campus has a head and then we have two main departments and under each there are about four units with heads. The main departments and the units are Information Services (Acquisitions, Cataloguing, Special Collections, Reference Services) and Technical Services/ support (ICTs and Electronic Resources)."

To reflect current trends and evolving roles of libraries, participant D had a unit dedicated for learning and research support for solely research activities. In addition, they had a unit for collection development just like participant A. From the responses from the University Librarians, the libraries had been in existence since the establishment of the universities and their strategic goal aligned with the university's main strategic goals which was to provide resources to support the three main core areas of the university: teaching, learning, research and in some few instances consultancy. It can be gleaned from the responses that the library provides in context information

resources that are based on the curriculum and courses taught at the university. The library although an academic library also serves as a public library.

Observations by the researcher showed that although outsiders were allowed into the library, they were only allowed to use and access materials within the library premises and even with that access was strictly granted to registered students and staff to certain units and resources in the library. In terms of the staff capacity and units, it was also dependent on the size of the university and their resources. Traditionally, all the universities had these core and traditional sections which included acquisition, cataloguing, reference services, electronic support unit or electronic resources services, digitisation and institutional repositories, Africana or special collections and majority of the universities especially the large ones and very old ones had technical services unit.

4.4.2 MISSION, SCOPE AND FOCUS OF LIBRARY COLLECTIONS

In developing a framework for the management of indigenous knowledge systems in public university libraries, one key objective was to find out about the mission, scope and focus of the library's collections (see Chapter Two). In order to ascertain whether these elements were present, the researcher studied the collection development policies of the university libraries. Additionally, the researcher observed the collections of the libraries and also critically examined the strategic goals of the respective universities and that of the libraries by analysing the policies, mission statements, core values of the universities (see Chapter Two). Furthermore, the researcher interviewed the university librarians on the strategic goals of their libraries and focus of their collections. In general, the mission of the libraries was provision of information resources for teaching, learning and research (in both print and electronic format), support teaching, learning and research, collection of resources based on the university curriculum.

After examining the mission, scope and focus of all the libraries collections, it was clear that none of them focused on the management of indigenous knowledge. It was obvious that the focus of all

the library's collections was geared towards their respective teaching and learning programmes that were offered at the various universities. As part of this, the University Librarians were asked about the strategic goals of the libraries and the focus of their collection development policies and it was obvious that while their strategic goals were aligned to the broader strategic goals of the university, the focus of the collections was on teaching, learning and research of taught programmes at the universities.

From the observations of the library's collections, there were collections of books from Ghanaian authors in different disciplines. The collection that came close as to what may be assumed as indigenous in nature were in history, storytelling, poetry, some videos and tapes of ceremonies, festivals and other ceremonial functions were what was deemed documentation of knowledge in a traditional or local content and context portraying some of the rich culture and stories on Ghana and other historic events. However, this was just noted in a few institutions under study. One librarian stated that they had some historic information on microfilm and some recordings as well, but those materials were brought to them by the institutions concerned for safekeeping and they didn't go out for it. It was thus realized that the libraries only acquired materials based on the curriculum of the university in collaboration with faculty to suggest materials that they thought were useful for their courses and to be used as reference materials for students each academic year. Although the acquisition librarians buy books in general in addition to titles suggested by faculty members, these materials were still based on taught programmes and courses at the university.

4.4.4 AWARENESS AND UNDERSTANDING OF INDIGENOUS KNOWLEDGE SYSTEMS

Awareness and understanding of indigenous knowledge as had been discussed earlier also forms the basis of integration. The whole idea here was to find out from the managers of the libraries about their awareness and perception of IK and whether they considered it as an important asset to preserve. Interviewees were also conducted to ascertain in their own opinion what IK was, whether they had IK resources in their collections, the nature of IK resources in their collections,

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whether they had taken any measures in its recognition if they did not have it in their collection and lastly some of the challenges they anticipated with the management of IK in the library. The responses were given as follows.

Table 4.20: Definition of IK by University Librarians

Librarians definition of IK
Participant A Indigenous local knowledge which is relevant to the socio-cultural needs of a group of people and which uses are very situated.
Participant C Indigenous knowledge is what we call local or traditional knowledge which is everything about our culture and way of life as a people in different communities.
Participant E Indigenous knowledge is our language, art works, dances, music, naming systems, artefacts, religion etc. which are all part of our existence and everything that makes our society and culture unique.
Participant F Knowledge which is quite unique to a particular cultural area or a particular activity in an area.
Participant G Indigenous knowledge is the traditional way of getting information from people including our families and the people that surround us.
Participant H

Indigenous knowledge is primary source of information that we obtain from the grassroot or the very source of the information, probably some kind of information that is not documented.

Participant I

Indigenous knowledge is knowledge that resides in individual minds. It is knowledge that is not explicit but tacit and oral in nature

Source: University Librarians Data 2019

From the definitions that were given by respondents generally, these key concepts were deduced as participants categorization of indigenous knowledge.

Figure 4.19: Concepts used for IK
Source: University Librarian Data 2019

Participants were all aware of indigenous knowledge system and gave their opinions on what IK was and its relevance to development and the need for it to be preserved. Although participant A

acknowledged the importance of IK, it was clearly stated that the uses of IK was very situated and depended on what it was used for and that its relevance to the development context of our country was something that needed to be encouraged. One key factor worth noting by participant A was how relevant IK was to the teaching and learning programs within higher education. Participant A stated that within the library system, there were no collection of IK resources which was accessible or usable by staff and students in it very oral form and therefore may not be accessible in the same way that we access resources for books. Talking about the challenges that they anticipated, Participant A categorically stated:

> *"So yeah, IK is very relevant and appropriate for higher education and learning environment. But for now, I wonder whether we have the knowledge and the skills to properly organize, curate, manage and preserve IK."*

Participant B indicated that their library had written a proposal attempting to see if they could have an IK unit, which was yet to be approved. Going further participant B added…

> *"We had indigenous systems which were functional even before the advent of education. A farmer could indicate when we should start planting particular crops and in which season. What was it that informed them to take those decisions? And we are in the part of the country where people are still so attached to their cultures and indigenous heritage. So why not study it?"*

Participant B further added the problem of funding, because codification and all those aspects of the management of IK are likely to incur a cost for one to be able to preserve it and the participant mentioned the need for a concerted effort and support of the university management itself.

Participant C mentioned the importance of Indigenous Knowledge and its benefits in health and medicine, food, agriculture, music and dance, folklores, innovation among others and had a strong belief that although indigenous knowledge will forever be with us, it was considered critical for it

to be preserved so that it does not lose its original value and richness because of modernity. Participant D was of the view that indigenous knowledge was not harnessed because there was no conscious effort to capture them for possible retrieval or use. It was thus emphasized that although some cultural systems were dying out, there still existed people who knew the history of these systems and whom information professionals could probably approach and capture the knowledge. Indigenous knowledge as mentioned by participant D was an emerging area and the whole concept of knowledge management was new to librarians in Ghana.

Participant E mentioned many aspects of IK such as art works, music and dance, naming systems, artefacts, religion etc and noted that one way of preserving IK was through our naming system where people were more interested in giving local names to their children and stated…

> *"*If we do not acknowledge and cherish the fact that our culture is unique and potent and can do much for us, then we are not helping in developing it. Because the culture helps in development."

In terms of keeping and preserving IK, participant E mentioned that universities may not be doing it institutionally, but they may be keeping it culturally. Participant E added that the other way to preserve our IK was through the media broadcasting using local language where contents can be well explained and communicated to indigenes. It was clear that there were no IK materials/resources in the library's collection, but the participant added that the library had to make a conscious effort to educate and advocate with the lecturers and departments to gather and document IK relevant to research and development.

Participant F although acknowledging the importance of IK, was not sure if there were any systems to help disseminate the information. Contrary to other opinions, participant F didn't see indigenous knowledge as becoming extinct at all because it was going to be there forever through generations. Participant F further mentioned that the 'Africana unit' which host materials that were quite indigenous in published formats should be in charge of the management of IK. However, if the

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library happens to manage this kind of knowledge, then it had to be a specialised library and there should be resources to collect that kind of information because it may involve travelling far to collect the information, recording, transcribing and preserving original tapes. Participant F added...

> *"it can't be a general library like ours trying to do it. It will be difficult, unless that library has a project in mind that this is a project we want to do on IK and raise funds for the resources and expertise that may be needed to carry on the project, then we can do it. In general, it is going to be difficult because the focus of our collection is not on IK. But if it is specialised like Africana section, then we have a focus and can embark on it."*

Participant H acknowledged the fact that IK was a primary source of information known as oral traditions of information dissemination, but how it can be collected, stored and managed had always presented a challenge and that the library cannot boast of such knowledge system in their collection. Participant H added...

> *"To say indigenous knowledge is important is even an understatement to me. It is absolutely necessary to take charge of that kind of information, to possess it and manage it. Thus, it is necessary not to let our indigenous knowledge be lost. So, what I think libraries could do is to go out there and try to obtain this kind of information from various source."*

Participant H acknowledged that academic libraries by nature acquired information on any subject area aside their specializations which could include IK. Participant H added…

> "The library can only preserve indigenous knowledge when they focus on it as a primary source of information that is useful. Then we can invest in resources that can help us collect, document, store, manage, preserve and disseminate IK."

Participant I did not see indigenous knowledge as becoming extinct because it was part of our culture and it will forever remain with us as the people. The only problem that was foreseen was its informal nature. In relation to IK collection and its management, participant I noted explicitly that the library did not have IK resources in their collection and had not formally taken measures put in place to collect and manage IK.

The responses showed that interviewees were very much aware of indigenous knowledge. They gave their opinions about what indigenous knowledge it was and the fact that it was very vital and needed to be preserved before it becomes extinct. However, while some believed that it had to be managed by libraries, others had varying views such as the challenge academic libraries may face of IK being not be included in the curriculum and so in such instances it may be difficult to allocate resources to collect materials because libraries collect materials based on the curriculum of the universities for teaching, learning and research. It was clear that librarians saw indigenous knowledge as important, beneficial and needed to be managed for its preservation.

4.4.5 POLICIES AND FRAMEWORKS GOVERNING THE MANAGEMENT OF INDIGENOUS KNOWLEDGE

It was very important to know the policies and frameworks that governed the management of indigenous knowledge by information professionals in the universities. To understand this, questions on whether the libraries had a collection development policy were asked and whether these policies were operational. The focus was to find out whether the policies catered for the management of indigenous knowledge. This is crucial because libraries collections are guided by their collection development policy. Lastly, the researcher sought to find out whether they were aware of any national policies that mandated libraries to manage indigenous knowledge.

Participant A had a collection development policy (CPD) which highlighted the different types of collections that the library had gathered and made available to students and faculty for teaching

and learning purposes. However, the CDP was heavily skewed towards formally published materials and monographs to the disadvantage of other knowledge resources. Participant B had a CDP which was operational, but their policy did not cater for the management of indigenous knowledge. Participant E acknowledged they had a CDP as a library but not a heritage institution and suggested information professionals to re-engineer their thinking towards the collection of IK. Participant E argued for an institutional policy to put down the footprints so that academic institutions could do theirs and research institutions as well. Participant F had a CDP but no aspect of it catered for the collection and management of IK. Participant F stated:

> **"**Indigenous knowledge is important, but it is not one of the primary roles of the library. But if you take what our library was established for, we have primary roles which are teaching, learning and research. So, for teaching, we need books, e-books etc. For research and even with research, it is not everybody who is interested in indigenous knowledge."

Participant G was of the view that libraries did not need a national policy to mandate them to start collecting and managing IK and noted:

> *"*In our library for instance, 90% of our CPD has to do with the courses that we ran here but the 10% is geared towards other courses. So, in the same way, we can collect indigenous knowledge as part of the 10% of our other collections outside our curriculum that we collect materials on."

Generally, participants indicated they had a collection development policy with the exception of Participant C and H, but they indicated that their collection development policies although operational, did not cater for the management of indigenous knowledge. Only Participant E indicated the awareness of national policies to manage indigenous knowledge in other countries but not Ghana. It was evident that the collection development of the libraries satisfied their teaching, learning and research needs of the universities and although the policies were available and operational, no aspect of them catered for the management of IK.

4.4.6 KNOWLEDGE ORGANISATION SYSTEMS USED IN THE LIBRARY

It was important to know the knowledge organisation systems that the libraries use to catalogue and classify their collections and whether these systems made room for indigenous subject headings. It was evident that all the libraries used the library of congress (LC) classification system to catalogue and classify their collections. Participant A had doubts whether LC made room for indigenous knowledge systems and believed there might be something broadly under culture, but culture was very big a term. One striking comment by Participant A was that the LC classification system was obviously not developed with indigenous knowledge systems in mind. So, he suggested that librarians should take IK management systems on board and concluded:

> *"I wouldn't be surprised if universities elsewhere, somebody has made the effort to expand the LC system to reflect IK. Even in Africana, we do not have a specialised collection for indigenous knowledge. That is why I mentioned the management of IK

will be focused and successful if we create specialised collections."

Participant B added:

> *"I wouldn't be in a good position to tell you. But the Library of Congress classification system as it is, because it is expandable by itself, I think that will make it possible to expand it and add new subject headings and use it to our advantage."

Participant C was of a strong view that the Library of Congress classification system was broad enough to make room for new subject headings and so was sure it could cater for indigenous headings. If it could be worked at it and Participant G concurred with this. Participant E however doubted if Library of Congress classification system made room for indigenous subject headings. Participant F was sure that some thesaurus in different areas may make some provision for indigenous headings but was not absolutely sure of the Library of Congress and stated...

"because I have not studied it extensively in this regard. Library of congress classification is very big with its various areas, but individual disciplines may have their own thesaurus to make room for indigenous subject headings."

Participant H also added…

"If library of congress does not have indigenous subject headings already, then I will be surprised. Beyond that, I know the library of congress classification system is very versatile and expansive. There is room for new subject areas and expansion on subject areas. So, the library of congress can accommodate new subject areas."

For Participant I although the Library of Congress classification system made room for expansion of subjects there was a challenge according to Participant I who said:

"The challenge I see is the language barrier. How are we going to translate all these local names to scientific terms? Well, that will be innovative, but it poses a lot of challenge because not all our local terms have English translation."

All interviewees indicated that the knowledge organisation system they used to catalogue and classify their collections was the Library of Congress classification system. As to whether the library of congress made room for indigenous subject headings, respondents indicated because the library of congress was expandable, it could make room for indigenous subject headings. However, Participant A was not sure of this. Participant I indicated that although LC is expandable, the challenge was language barrier because not all the local terms may have English translations.

4.4.7 LIBRARY PROGRAMMES AND SERVICES

Library programmes and services are also a determining factor to know whether indigenous knowledge systems are inclusive or not. Participants were asked whether the outreach programmes that the library undertakes and awareness programmes on the importance of indigenous knowledge and whether the programmes were targeted towards indigenous communities within which the

libraries were located. Furthermore, participants were asked whether they saw it as a responsibility to serve these communities to manage their IK. They were further asked whether they had documents that were accessible to indigenous communities, and the ways in which they could enhance services and programmes to indigenous communities.

Participant A indicated that they did not necessarily have an outreach programme of reaching out to people in the community, but they had an open-door policy where visitors could walk into the library and made enquiries which were attended to. However, even with their engagements with the public or community, none of the programmes or services focused on indigenous knowledge systems. Participant B and C categorically stated that they had no outreach programmes to reach out to indigenous communities. But Participant C mentioned that the current programme they have had was the library week celebration which focused on users and publicizing of the library resources. Participant D, F and H attested to the fact that they had community programmes which supported some libraries in the community in managing the library and gave them some of their weeded materials and equipment. However, none of these programmes was towards the management of indigenous knowledge. Participant H and I indicated that they had no outreach programmes that focused on indigenous knowledge. But participant I added that their outreach programmes were geared towards helping libraries within the community through donating books to them and setting up reading clubs for the schools.

From the responses, Participant A, B, C and H indicated that they had no outreach programmes. However, Participant A said that although they did not have any outreach programmes but emphasized on the need to create space for other forms of knowledge available and such as, indigenous knowledge. Participants D, E, F, G and I indicated that they had an outreach programme but none of these programmes focused on indigenous knowledge, its management and preservation. Participant E indicated that their outreach programme was the exhibition of their resources to their users within the university community. Participant F said they had programmes to help local libraries stock their library with donated books. Although almost half of the libraries

had outreach programmes, none of these focused on creating awareness on the importance of indigenous knowledge or its management and preservation.

4.4.8 INTEGRATION OF IK INTO LIBRARY SERVICES

Questions on integration of IK into the library services included whether IK was well represented in the library's collection, the strategies the library had put in place to enable access to IK, whether IK was an intellectual asset that needed to be managed, whether the library should the library consider the management of IK as one of their primary roles and how best the library could integrate IK into its collection. By integration, the key elements that was considered here was the whole concept of indigenous knowledge management systems into library services to embrace social inclusion, equality and transformation to integrate other forms of knowledge systems for sustainable development.

For Participant A what was reflected in the library's collection was a reflection of the teaching and learning programmes. And so, the curriculum of the university and the teaching delivery methods that lecturers followed may encourage students and other people to use particular types of knowledge resources. These had to be reflected through the lens of teaching and learning delivery methods that prevailed in universities and how that encouraged learners and users to access particular types of knowledge including indigenous knowledge systems. Although IK was considered an intellectual asset, the curriculum and teaching models did not create the avenue for the management of such knowledge. The library therefore had no strategy in place for the management of IK nor had they integrated any aspect of it into their services.

Participant B noted that it was quite difficult to integrate IK into the library's collection and for its integration, the approval and support from management especially in terms of budget because all acquisitions at the library were budgeted for annually. Participant C indicated that what was considered as indigenous knowledge resources in their collections was publications from Ghanaian

authors which were appropriately catalogued as such. In addition, participant C noted that the only way the library could consider the management of indigenous knowledge as one of its primary roles was if it was part of the programmes offered at the university. Participant D established that the library could develop strategies for the management of indigenous knowledge easily if it was part of the programmes offered at the university. Other than that, it would be somehow difficult to concentrate on it. Participant E had a differing opinion and indicated that the library could start collecting IK resources and once people became aware that this type of information was available at the library, they will come requesting for it.

Participant F on the other hand categorically stated that integration of indigenous knowledge into the library's collection now was not possible because indigenous knowledge broadly was not the focus and so concentrating on it was not cost effective for the library. Participant F further indicated that the library did not have the resources for it and so if it needed to be considered, it had to be a part of a project because although IK is an intellectual asset, it was highly specialised. For Participant G, IK could be integrated into the library's collection if it was something that users want. Participant H opined that integration was possible but everyone including key stakeholders, information professionals and people within communities had to come on board for it to be successful. Thus much of it depended on users if it was something that they were interested in, then it was very possible for the library to integrate it into their collection irrespective of the format with the appropriate tools and technology to effectively provide access to it.

For Participant I, before information professionals would want to integrate IK into their library's collection, it was critical to ask whether they had the capacity, expertise and resources to do it. By so doing they could outline what strategies they needed to put in place for the collection, management and preservation of IK. Just like the others, participant I added:

> "For us to consider the management of IK as one of our primary roles as academic librarians will depend on the programmes that are taught in our institutions. This is because our collections are based on the courses that are offered by the university. By so doing, then we can integrate IK in our collection."

On the issue of integration, all participants acknowledged that indigenous knowledge is an intellectual asset that had to be managed and that indigenous knowledge collections was not well represented in their library's collection. Participants who indicated they had some indigenous knowledge collections indicated that they were books written by Ghanaian or African authors. Participant A indicated that anything represented in any library's collection was a reflection of the teaching and learning programmes of the institution and again the teaching delivery methods could encourage the use of particular types of knowledge resources.

From the responses, there was no integration of IK into the library's services nor equity in terms of knowledge systems that was used and documented in the library, since the knowledge system in use was to the advantage of western knowledge. Thus, in relation to the transformation of knowledge systems for sustainable development, IK was marginalised although its importance to effect change was acknowledged.

4.4.9 STAFF TRAINING PROGRAMMES ON IK

It was important to find out whether staff had had any training on the management of indigenous knowledge and if they did, what were the key elements and focus area were in their trainings. On staff training programmes, all participants indicated that they have not had any training on the management of indigenous knowledge in the libraries. Participant A although had attended conferences on knowledge management, indicated that none of the conferences focused on indigenous knowledge. According to participant A this was something the library association could take up to conscientize information professionals on it to get the understanding and develop their interest for the management of indigenous knowledge. Participant E had also attended conferences outside Ghana where the focus was on indigenous knowledge since IK was a personal area of interest to the participant.

4.4.10 TOOLS AND EXPERTISE NEEDED FOR THE MANAGEMENT OF IK

The nature of IK requires appropriate tools and expertise for its management. Participants were asked whether the library had the requisite tools and expertise to manage IK. They were also asked whether the library was equipped to render services to indigenous communities in terms of the management of their indigenous knowledge.

Participant A indicated that every librarian who had been trained in Ghana one way or the other would have done a course in information management that provides the kind of training to equip people to manage information and in that regard the tools and skills for curating informal knowledge resources. Participant B indicated they do not have the skills to manage information of this nature. Participant D was convinced that since information professionals already have the skills in managing information, further training will provide them with the skills and expertise to enable them to manage and preserve indigenous knowledge.

Participant E indicated that expertise and skills was something that could be developed and so once they decide to embark on the management of IK, they could develop the skills of staff to manage it and that although they may not have the resources, they have the potential and goodwill to embark on it. Participant F emphasized on the need for further training if librarians want to be involved because managing IK was not a general thing like other forms of documented knowledge. Participant G also suggested further training for librarians to embark on the management of IK. Participant H indicated the need for every library who would want to embark on the management of IK to acquire the necessary tools and logistics to do so. Participant I was of the view that librarians may have all the skills but when it comes to the collection and management of IK, they may lack the expertise in collection and documentation and may need further training on that.

This attests to the fact that the form and nature of IK requires certain skills, tools and expertise and so for information professionals to embark on it, there is the need to satisfy the training needs in

such areas and acquire the necessary tools and logistics for its collection, management and preservation.

4.4.11 INDIGENOUS KNOWLEDGE AND EDUCATION

The researcher wanted to know whether any aspect of indigenous knowledge was included in the university's curriculum. This could be a factor for integration of IK into the library's collection, services and programmes. Participants were thus asked whether IK was included in the university's curriculum and which department in the university was in charge of IK curriculum. A follow up question was asked whether librarians think the inclusion of IK into formal education would help in the management of IK and subsequently help the library to focus on IK collection.

One of the participants (Participant A) indicated that although there were courses at the university that may reflect IK practices in their teaching and learning programmes, the participant was not sure if there was any department in charge of IK curriculum. The participant further emphasized that there was no central curriculum development unit at the university and that curriculum development respective to specific departments. Participant B, C, F, and G noted that once indigenous knowledge systems were included in the university curriculum, the library would be mandated to collect the requisite resources and make them available and accessible to users. Participant D attested to the fact that there were courses that were taught at the university that were indigenous in nature, but materials used as references in such areas were documented in the form of books and articles. Participant E indicated that IK may be included in the curriculum of the university, but it may not be something that was conscious, but it was there especially programmes in African studies which make use of indigenous knowledge resources through research. Participant H and I noted that the inclusion of IK into curriculum depended on policy makers and whether they deem it key for inclusion, but further stated that librarians could teach it as part of the information literacy programmes that were taught in the form of grey literature or tacit knowledge.

From the responses there was room for inclusion and integration of IK into education once it was part of the university curriculum. In terms of equality in the knowledge systems used in the universities, there was a vast disparity to the advantage of documented knowledge because the teaching delivery methods used within the universities promoted the use of western knowledge to the disadvantage of indigenous knowledge.

4.4.12 INDIGENOUS KNOWLEDGE AND SUSTAINABLE DEVELOPMENT

Participants were asked about the role of IK to development in their opinion. They were further asked if there was a direct relationship between the management of IK and development and whether the management of IK by information professionals would ensure its inclusion into development projects and decisions. All respondents indicated that indigenous knowledge was very fundamental to development and had a direct relationship in that sense. They also agreed that information professionals could collaborate with experts in various discipline to collect, manage and preserve IK for sustainable development.

According to Participant A the inclusion of IK, which is culturally relevant knowledge to development would enhance its usability because people can relate to it. He emphasised that the library could start curating IK and bring it to the attention of the academic staff who would use it. Likewise, the academic staff could start making demands for it which will force the library to gather IK. Whichever way one does it, what is important is that there is something, a particular type of knowledge resource which is rich but nonetheless neglected. This will inform the teaching delivery programmes we have in our university and make education more relevant to the socio-cultural needs of Ghana.

Participant B blamed the position of the country and an institutions regarding the status of indigenous knowledge on the adoption of foreign systems and stated…

> *"If you take the Japans and the Chinese who decided to develop based on their own indigenous systems, if we had done that for ourselves, we would have developed and made our systems and economy better. We do away with anything indigenous and adopt everything western which many times doesn't work in our system and environment."*

Participant F added that developments failed because, the people bringing the project comes with pre-conceived ideas which many times doesn't work because it doesn't serve the needs of those targeted by the development endeavours. Participant G and H emphasised on the urgent need to include IK in developmental decisions and projects. Participant I acknowledges that IK had been mismanaged because of modernity and the need for information professionals to make the necessary effort to preserve it for posterity. All respondents indicated that IK was key to development and had a direct relationship in that sense. They agreed that information professionals could collaborate with experts in various disciplines to collect, manage and preserve IK for sustainable development.

4.4.13 INDIGENOUS KNOWLEDGE AND INTELLECTUAL PROPERTY RIGHTS

Through the interviews some respondents pointed out some of the measures that needed to be considered in managing and preserving IK by information professionals. Participant A pointed out that in as much as he wanted to collect, document and manage indigenous knowledge, issues of ownership and copyright which could also be a hinderance to our attempts at managing it must not be forgotten. These issues must be dealt with. For example, if a particular information has been patented, we cannot just use it without permission. Participant C also noted that indigenous knowledge is an intellectual asset, and it was critical to protect it from overexploitation. Once we refine the knowledge through innovation, then we can apply intellectual protection laws such as

patent and copyright. These are the two laws that I think are applicable when working with indigenous knowledge.

Participant G on the other hand indicated that IK is an intellectual asset but putting copyright or people patenting as a prerequisite will restrict access. The participant added that since these were means by which our folks taught on a particular knowledge, then it was going to restrict usage and in effect not produce the kind of effect we anticipate and noted...

> "Indigenous knowledge is a primary source of information and putting a copyright on
>
> it may not be fair. But if you take that primary source and process it, then yes, you can
>
> place a premium on it. But at the raw stage, I don't think it's fair in my opinion."

4.4.14 INFORMATION COMMUNICATION TECHNOLOGIES (ICT) AND INDIGENOUS KNOWLEDGE SYSTEMS

Collection, documentation, codification and dissemination of indigenous knowledge by its nature requires the use of certain tools to make it possible. Some participants suggested the use of ICTs to make this process possible. The use of tape recorders, cameras for videoing and taking pictures are all aided by technology. The use of ICTs is thus very useful and needed in the whole processes of collecting IK right to its dissemination and subsequent preservation.

It was observed that some of the universities had a documentation centre and a digitisation unit as well with tools and equipment that could be used for recording, videos, scanning, editing amongst others. The digitisation unit manages the institutional repositories of the universities where they archive various forms of information. It was seen that staff at such units were very much equipped and would be able to collect and manage tacit knowledge and store it on the institutional repositories of the universities as they do with speeches and recordings of programmes of the universities. The institutional repositories were designed by the institutions themselves and are

basically databases of local content including thesis of postgraduate students, publications of staff, lecture slides, pictures, speeches and videos of key ceremonies held at the university. Some rare materials that had been digitised (amongst other local content) that were useful for academic purposes. All the universities to some extent had a very good ICT infrastructure for sharing and allocating resources to its users.

4.4.15 CHALLENGES TO THE MANAGEMENT OF INDIGENOUS KNOWLEDGE BY INFORMATION PROFESSIONALS

Respondents were asked to indicate the challenges that they foresaw with the management of indigenous knowledge. One of the challenges to this course as stated by Participant A was whether from a strategic point of view management even thought that the management of IK was something important, in terms of the buy-in that people believed that it was important was one of the main hurdles. Again, unlike published materials, gathering and curating IK could be capital intensive. So, the challenge would be about financial resource, human resource with the right expertise to gather and curate these types of materials. The other challenge related to whether academic staff were happy and prepared to integrate IK into their teaching and learning delivery programmes.

Participant B mentioned financial constraint and lack of the tools and expertise to manage and preserve it. The issue of intellectual property right was also a constraint. For participant C, one of the major challenges restricting librarians in collecting indigenous knowledge especially in the academic environment was the fact that indigenous knowledge was not part of the university's curriculum and stated…

> "Once it is not part of the curriculum it would be difficult for the institution to allocate any budget and resources for its management. So, there is a problem of funding, resources and staff with the expertise to engage in the collection, documentation, management and preservation of indigenous knowledge."

One major challenge according to Participant E was the lack of interest on the part of information professionals to embark on the management of indigenous knowledge. Participant F indicated that technology was changing all the time and current infrastructure available at the library could not accommodate oral type of information because the tapes were obsolete. Again, one needs to keep migrating the information as technology changes to make them accessible and usable, which involves a lot of resources.
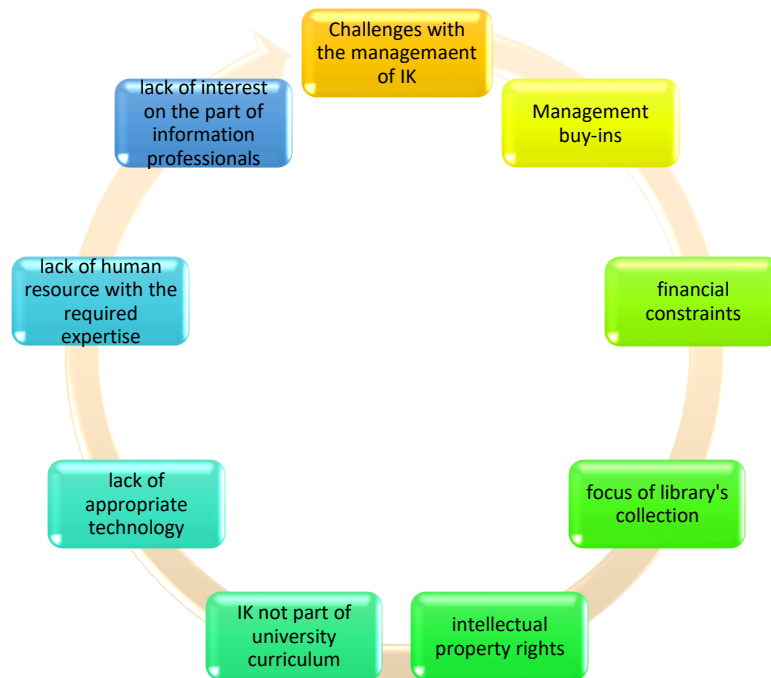
Figure 4.20: Challenges with the management of indigenous knowledge
Source: University Librarian Data 2019

Respondents indicated many challenges that may come with the management of IK by information professionals. Amongst the challenges that were indicated by respondents were financial constraints, lack of human resources with the required expertise, intellectual property rights, IK not part of university curriculum, lack of appropriate technology and lack of interest on the part of information professionals and management buy-ins.

4.5 SUMMARY

This chapter concentrated on the presentation of the findings from the study from the three categories of staff which comprise university librarians who were the directors of the university libraries, heads of units of the various sections within the library, senior and junior staff who were staff at the operational level. Because the study adopted mixed methods, both quantitative and qualitative data were collected from respondents. The quantitative data was collected and analysed from both staff and heads of units while the qualitative data was collected and analysed from university librarians, through observations and some document analysis. In reporting the responses from the quantitative findings, the results were analysed using SPSS and open-ended questions were coded and analysed quantitatively. The qualitative responses from the interviews were recorded and transcribed by the researcher and coded according to themes. Themes were developed from the research objectives and so responses for both quantitative and qualitative data were analysed according to these themes in separate sections. The next chapter discusses the interpretation of the data from the findings of the study in this chapter.

CHAPTER FIVE: INTERPRETATION AND DISCUSSION OF THE FINDINGS

5.1 INTRODUCTION

The purpose of the study was to develop a framework for the management of indigenous knowledge systems in public university libraries in Ghana for its effective management. The previous chapter presented the findings of the study guided by the themes that were developed from the objectives of the study. This chapter presents the interpretation and discussions of the findings that emanated from the research. This part presents an extremely important aspect of the entire research because it is only at this point that meanings can be made out of the findings to the understanding of readers. Making meaning out of data according to Chireshe (2015:130) is where the researcher can discuss and consider the similarities and differences between responses from participants with different characteristics. This is the situation for quantitative analysis. Ngulube (2015:152) asserts that "qualitative data analysis involves the identification, examination, comparison and interpretation of patterns and themes." However, since the mixed method approach was used in this instance, data was interpreted in an integrated manner according to the themes developed from the objectives of the study to come up with accurate conclusions. Using mixed analysis in an integrated manner according to (Onwuegbuzie & Combs 2015:38) involves the use of both quantitative and qualitative techniques in the same framework to address the research objectives and produce findings that are greater than the sum parts. It is at this stage that readers can attach meaning and understanding to the research and researchers can avoid fabricated generality.

The overarching purpose was guided by research objectives under various sections to better explore all the necessary questions that could guide the researcher in developing a framework for the management of IK in public university libraries. The specific themes that aligned with the research questions were:

- Mission, scope and focus of library collections
- Awareness and understanding of indigenous knowledge (IK)

- Policies and frameworks governing the management of indigenous knowledge

- Knowledge organization system (KOS) used in the Library

- Library programmes and services

- Integration of indigenous knowledge into library services

- Staff training programmes on indigenous knowledge

- Tools and expertise needed for the management of indigenous knowledge

- Indigenous knowledge and education

- Indigenous knowledge and sustainable development

- Indigenous knowledge and intellectual property rights

- Information communication technologies and indigenous knowledge systems

5.2 CHARACTERISTICS OF PARTICIPANTS

As can be seen from the previous chapters, participants were of different backgrounds in terms of status within the university libraries. One would have anticipated that a study of this nature required decision from the management level so why include senior and junior staff? It was very necessary to include all category of staff from management level to the operational level. It is an undeniable fact that university librarians approve every decision concerning the library in consultation with the heads of units. Heads of units also come up with decisions in consultation with senior and junior staff concerning their respective units. The ones who interact closely with users on a daily basis are mostly the senior and junior staff. This means they are in a better position to inform the heads the kind of services more patronized by users or what their information needs or requirements were before they report to the respective heads the need for such services and information if it was not provided by the library.

Majority of the respondents were from KNUST, UG and UCC. This was not surprising because they are the three oldest public universities in Ghana. The functions of the units reflected their activities. Staff working experience on a job gives them the exposure in building their skills and

expertise in their field of work. Looking at the statistics from the findings, it was clear that majority of the staff had worked in the library for over six years and therefore may have developed the requisite skills on their job. It was therefore assumed that with such years of experience, staff would be in a better position to tell whether the management of IK was an important endeavour for the library to pursue. Staff level of education was also a determining factor to their appreciation, understanding of IK and the need to manage and preserve it. Majority of the staff had a bachelor's and master's degree in the profession. The staff were thus qualified to work in the library.

The nature of the study required opinions from all library staff with the purpose to develop a framework for the management of indigenous knowledge systems in public university libraries in Ghana. As mentioned earlier in chapter three, the staff were essentially alike in terms of the structure of the library system and routines and functioning of work across the universities. Within the library system, there were different categories of staff based on rank. There were senior members who were the managers of the library and its various units. There were also the staff made up of both senior and junior staff who were at the supervisory and operational level. Based on this, the participants were categorized into three main groups:

1. University Librarian (Directors of the Library)
2. Heads of Units (Managers of Units/Sections/Departments)
3. Staff (Operations)

Thus, soliciting information from the various categories of staff was very crucial in achieving the purpose of this study.

Although the University Librarians were the directors of the library, certain questions were best answered by the heads of units or the staff who were directly involved with the activities and operations of their respective units. It was clear to note that when it came to issues of policies and management decisions, librarians and heads of units were in the best position to give the right information. In the same way, issues of operations were best handled by the staff who were involved at the operational level. This was good to achieve the purpose of the study and to ensure

that in developing a framework for the management of indigenous knowledge systems in the libraries, the opinions of all staff was incorporated.

5.3 FUNCTIONS OF UNIT/SECTIONS/DEPARTMENTS

The libraries had various units/sections/departments for their different operations and each of these unit was managed by a head who was at the managerial level according to the staff status of the universities. The standard units of the libraries were acquisitions, cataloguing, reference services, electronic resources, special collections, digitisation/institutional repository and ICT support. Apart from these standard units some of the universities had other units like technical services, research and training amongst others which in some institutions came under the standard units. The functions of the units/sections/departments were described in table 5.1 below:

Table 5.1: Functions of Unit/Sections/Departments	
Unit/Section/Department	Functions
Acquisitions	Acquiring books and material (irrespective of format), stock management, curriculum support
Cataloguing and Classification	Provision of resource description for items in the library's collection, creating metadata, creating bibliographic records
Reference Services	Library services that assist users to find the information they want
Special Collections	Responsible for managing special collections in the library such as African, special publications from the world bank, UN etc., university gallery etc.
Electronic Resources	Provides users access to information resources and trainings that are useful for teaching, learning and

	research such as academic databases, reference management software etc., training of users on the use of electronic resources,
Digitisation/Institutional Repository	Digital content of scholarly or heritage materials, open access electronic archive for the collection, preservation and distribution of digital material
ICT Support	Internet services, software development and management, library website management, provision and maintenance of computers etc.
Technical Services	Provides bindery and photocopying services

Table 5.1 explains the functions of the various units within the library. These units were the very core and fundamental ones traditionally. Most of the university libraries had evolved and had divisions of units that reflected current trends in resources provision, access and support to users. In some of the universities, collection development and management covered acquisitions, curriculum support, stock management and preservation of library books and material resources. Participant A opined that units/sections/departments within the library must reflect modern thinking in library service delivery and so they had units such as collection development, student support services (reference services), academic engagement and innovation, ICTs and systems department and these names were reflective of modern library service delivery. All the other universities had the traditional divisions. Most intriguing was Participant D, they had a section for learning and research support and the unit supported all researchers with various research needs from literature searches to data analysis.

The libraries had existed since the establishment of the universities and their strategic goals were aligned to the universities to basically provide information resources and services that supported

teaching, learning and research. The libraries although they are considered academic library, the core users who were faculty, students and staff. the libraries were also considered public and open their doors to the general outsiders. However, there were some restrictions to the kind of access non-registered members could have. Outsiders could only use materials within the library premises but could not borrow any material from the library or take any material outside. Even with access to some facilities like research, knowledge and faculty commons, access was only given to registered users who were students, staff and faculty.

5.4 MISSION, SCOPE AND FOCUS OF LIBRARY COLLECTIONS

The mission of universities is primarily teaching, learning and research and these formed the basis of their core values. Embedded in these three strategic priorities was service which is an expression of universities core values to work to improve society at all levels (O'Banion 2010:1). The mission statement of an organization defines its culture, core values, ethics, fundamental goals and agenda and according to Chen (2019), it defines how these elements applies to an organization's stakeholders. It serves as a blueprint for organizations to outline the steps they need to take in order to achieve their strategic goals. It was clear that every university had its own mission, but they all aligned with the fundamental mission of universities which were established to provide higher education, undertake research, disseminate knowledge and foster relationships with the society and outside world. Addressing the scope and focus of library's collection, it was established that the collections of university libraries were based on programmes offered at the universities.

The strategic goals guided by the missions of the universities all talked about partnerships with external stakeholders. For example, the core value of UG was committed to knowledge generation that positively impact the lives of those within and outside the university community. Based on this the librarian was asked if this reflected the library rendering services to indigenous community and it was clear that this knowledge generation, they referred to was about their research output and had nothing to do with the library partnering with indigenous communities to collect and manage their indigenous knowledge. One noticeable core value was that of the KNUST which

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stated diversity and equal opportunity for all. Unfortunately, the researcher noticed that this diversity and equal opportunity had nothing to do with diversity and inclusion of other knowledge systems. That of UCC was very striking as it talked about teamwork and visionary leadership, user-focused, partnerships and ethical considerations which was quite unique but that also did not address nor had anything to do with the inclusion of indigenous knowledge management systems. UDS core values centered on diversity and socio-economic transformation of communities through practically oriented, community-based problem solving. However, this also did not in any way address the management of community-based knowledge. The mission and core values of UPSA, UHAS, UMAT, GIMPA and UEW were however very direct and focused on teaching, learning and research programmes at the universities and so it was clear from their goals to note that the focus and scope of their collections were strictly based on their taught courses.

Although universities such as KNUST, UG, UCC and UDS had striking core values and missions that appeared to involve both internal and external stakeholders, partnerships and community engagement which addressed diversity, equality and innovation of knowledge systems, none of these key elements addressed the integration of indigenous knowledge systems in the library's collections. It was evident that all the libraries acquired materials based on their taught programmes which defined the scope and focus of their collections. It was very important for the purposes of the study to examine some of the mission statements, visions statements and core values of the libraries since most of them had it posted at the entrances of their libraries and on their library websites. The results clearly showed that the libraries focused their collections on the subjects offered at the university. This agrees with the findings of Mhlongo (2019:165) that there were no targeted resources for indigenous communities.

To support teaching, research and learning at universities of higher education, academic institutions globally focus their library collections based on the degree programs they offer (Kostelecky et al 2017:185). It was thus confirmed that the mission, scope and focus of all the library's under study were geared towards their teaching, learning and research programmes with no focus on the collection and management of IK. It was evident that the weight and value placed

on IK in academic libraries was low and so such resources were not integrated into the library's collection. The need for diversity of solutions using both indigenous and western knowledge as opined by Burges (2015) for dynamism and flexibility was virtually non-existent in the universities. Everything was modelled after western ideologies and concepts without adapting to local context. Apparently, IK was obviously imperceptible and relegated.

5.5 AWARENESS AND UNDERSTANDING OF INDIGENOUS KNOWLEDGE (IK)

To ascertain participants understanding of indigenous knowledge, they were asked whether they were aware of IK and majority indicated their awareness of IK. All librarians indicated that they were aware of IK. It was evident that participants became aware of IK through various means including education, oral traditions, history, community, library's collections, publications, library awareness creation, and workshop/seminar/conference. Participants awareness of IK through education may not necessarily be formal education but traditional instruction methods, learning through observations by means of apprenticeship or experiential learning (Sarkhel 2016). Confirming the definition given by Sithole (2007:117), IK is built and acquired through the accumulation of experiences, informal experiences and intimate understanding of the environment in a given culture. These accumulations of experiences are part of the nurturing process of people within a given cultural environment and context. Awareness through oral traditions and history also affirms the very nature of IK which is fundamentally tacit or oral. However, people's awareness through publications, library awareness creation, workshop/seminar/conferences were not much remarkable. This could be attributed to the fact the fact IK is predominantly tacit and a vast amount of it is not documented nor widely accessible globally out of the communities from which it emanates.

Awareness of a concept is different from its understanding because the value that people will place on it depends on their understanding and its importance to them socially, culturally and economically. If information professionals understand the value and importance of IK, then they

can give it some level of urgency and the need to manage it in a way they know best. When asked to give their own explanation of what IK was, heads of units gave varied opinions of IK summarized as "IK is local, traditional or non-scientific knowledge system of society or culture peculiar to the inhabitants acquired either consciously or unconsciously through personal experiences, local traditions, culture, history, innovations and forms an enormous part of their very survival, guiding their way of life and across generations." Various opinions and labels had been given to what indigenous knowledge is and what cuts across these definitions is that IK is tacit, unique to a particular culture or society, based on experiences over a long period of time, dynamic and passed on from generation to generations (Warren 1991; IIRR 1996; Grenier 1998; Muswazi 2001; Chisenga 2002; Ngulube 2002; Nkata 2002;Nyumda 2006; Sithole 2007; Masango 2010; Sarkhel 2016:428; Ngulube & Onyancha 2011). Scholars have pointed out different definitions of IK but as explained by Ngulube and Onyancha (2011:132) our attention should not focus on an all-encompassing definition of IK, but we should focus on a framework that captures the main features of IK. Participants agreed with the features of IK that had been identified and as stated by Ngulube and Onyancha (2011) in table 5.2.

Table 5.2: Features of Indigenous Knowledge

FEATURES OF INDIGENOUS KNOWLEDGE
Tacit Knowledge transmitted orally
Traditional/Local/Non-scientific Knowledge
Experiential knowledge
Dynamic and adaptive to change
Community-based knowledge
Transmitted from one generation to the other
Rooted in a particular culture

Unique to every culture or society
Knowledge difficult to codify

Concurring with Mahwasane (2017), indigenous knowledge is tacit because it is conveyed in the form of narratives, traditional morals, opinions, rites and native language and this makes it difficult to codify. IK is local because it is a community-based knowledge and unique to a particular community and rooted in a particular culture. Because people acquire it consciously or unconsciously, it is a part of what people in a particular culture grow up with and pass it on to generations after them (Boven & Morohashi 2002; Ramasinghe 2008). Participants described IK using various concept as known in literature as culturally relevant knowledge, informal knowledge system, community-based knowledge, culture, oral traditions, traditional knowledge and local knowledge.

It was evident that participants understood what constituted IK and further indicated that IK was important. However just as stated by scholars in the field (Ngulube 2002; Sithole 2007; Lwoga & Ngulube 2009; Sarkhel 2016; Dlamini & Ocholla 2018), participants agreed that IK was becoming extinct and there was an urgent need to preserve it before they were completely lost. Based on this, participants mentioned which type of IK was known to them which included health care, education, natural resource conservation/management, agriculture, conflict resolution/management, oral traditions, culture, music and dance, religion, and artefacts. Indeed, in our indigenous communities, the number one health care solution is herbal or alternative medicines which are very common in the rural communities and in some parts of urban areas. Agriculture constitutes a very large part of Africa's contribution to economic development and about 60% of these practices are done through indigenous innovations. The same goes for and on in the areas of oral traditions, artefacts (beading, weaving etc.), music and dance, culture, education through apprenticeship and experiential learning, religion amongst others. Concurring with Owiny et al (2014), IK is the foundation for local-level decision in agriculture, healthcare, food

preparation, natural resource management and a congregation of other events such as folklores, festivals, music and dance, storytelling, ceremonies in the community etc. To attest to the importance of IK, the United Nations (2017) concludes that indigenous knowledge informs decision-making about fundamental aspects of the daily living and activities of people and their interaction with their surroundings.

Looking at the materials and the nature of IK in the library's collection, participants opinions showed more of written or documented information. Observations showed that what was regarded as indigenous collections were basically books written by Ghanaian and African authors including history and stories on towns, villages and about the people, their festivals and ceremonies. These collections in documented form reflected the very nature of library's collections which were basically books and journals as opposed to oral form or recorded tapes. This assents with the findings of Mhlongo (2018:166-167) that libraries in Africa over the years are inclined to the management of documented information and non-engagement of IK especially in the public sphere which tends to continually side-line IK, and this will potentially impede any integration efforts.

Regarding the frequency of use of IK materials in the library's collections, responses still pointed to books. Participants also enumerated the rationale for documenting IK to include preservation of cultural heritage, accessibility/usability of IK, management of local resources, research/teaching/learning, socio-economic development and sustainable national development. Many benefits of IK as pointed out by participants included embracing cultural diversity, trace genealogies and sequence of events, bridge knowledge gap, education and research, shape society, social inclusion, social transformation, source of information, promote development, knowledge acquisition, recreation (music and dance), alternative medicine, improved agriculture, dynamism and conflict resolution. This concurs with the findings of Sarkhel (2016:430) that IK encompasses a number of fields and manifests in many ways but not limited to information, practices and technology, beliefs, nutrition, health, veterinary care, human resources, education, communication, agriculture, religion, artefacts amongst others. Amongst these fields that make

use of IK, agriculture and medicine was seen as one major area where IK was very much utilized because African economies heavily relied on the agriculture sector as its backbone (Lwoga eta al 2010; Odero 2011).

Indigenous knowledge has always played a pivotal role in development of societies through agriculture, health care, education, history and culture, recreation, artefacts, natural resource management amongst others before civilization (Camble & Aliyu 2008; Jain 2008; Lwoga et al 2010). However, its management according to Adigun (2014:8) as distinct from western knowledge poses a lot of issues for the library and information services sector. These challenges points to the fact that the use of IK was situated and relies on what it was used for in terms of its relevance to programmes offered at the university. On the whole, participants gave their perceived ideologies and many reasons why IK was an intellectual asset and had many benefits especially to developmental projects and the society. However, these perceptions were far contrary from the actual situation on the ground. Nothing pointed out to the fact that libraries were ready and, in a position, to integrate the management of IK into their services which all borders on the issue of the focus of their collection and budget. This confirms the findings made by Sithole (2007:119) that African libraries remained largely foreign dominated, stocked with predominantly foreign content.

5.6 POLICIES AND FRAMEWORKS GOVERNING THE MANAGEMENT OF INDIGENOUS KNOWLEDGE

Issues on policies and frameworks governing the management of IK were bordered around the collection development policies of the libraries. The library's collection development policies provided the framework within which the library's collections were built. The collection development policies of the libraries were reviewed to ascertain whether the collection and management of IK was integrated into their activities. It was important to first note that the collection development of the public university libraries satisfied their respective teaching,

learning, research needs and taught programmes that were offered. Although participants acknowledged that indigenous knowledge was critical, they noted that the absence of its management in their collection development policy because the management of IK was not one of their primary focus.

It was evident from the findings that most of the libraries had a collection development policy that guided their selection of materials and deselection of materials, weeding, replacement of materials, interlibrary loans and consortia with other libraries. However, a critical study of these policies showed that no aspect of it catered for the management and preservation of indigenous knowledge. These observations made from analysing these policies agreed with the responses from participants that although there were policies available, none of these policies considered the management of indigenous knowledge. Participants were of the opinion that government policy rather than institutional one will mandate information professionals to start collecting and managing indigenous knowledge. Most of these collection development policies were operational but skewed towards documented information to the detriment of indigenous knowledge. This confirms the findings of Kostelecky, Hurley, Manus and Aguila (2017:185) that the focus of collection development of all academic institutions is on the degree programmes offered to support students and faculty in those courses. Unlike South Africa that has an IKS policy instituted in 2004, IKS policy was non-existent in Ghana and so on the whole the university libraries were not mandated in any way to pursue such venture. That would have been an initiative though, if any of the academic libraries started it. Apart from the collection development policies that guided the academic libraries collections, they were also guided by their budgets that were allocated to them each academic year. These were identified as some of the constraints that hindered libraries from taking on any additional project such as the collection, management and preservation of indigenous knowledge because their allocated budgets were woefully inadequate and targeted for specific needs.

5.7 KNOWLEDGE ORGANISATION SYSTEM (KOS) USED IN THE LIBRARY

The focus here was to determine whether using existing knowledge organization systems used by the libraries, it made room for the integration of indigenous subject headings. Although Mania (2012) stipulates that the knowledge organization system used by libraries did not accommodate indigenous classifications because they lacked representation of indigenous knowledge, one participant however, believed that it was something that information professionals could take on board. Emphasizing on this, it was believed that indigenous knowledge could be classified under culture and history by creating narrower terms under these broad specific subjects. If this was the case, does it imply that aspects of IK on agriculture, alternative medicine, food, natural resource management should also be classified under history and culture? Definitely not and as explained by most participants because the library of congress classification system used as the knowledge organization system for the libraries were expandable, librarians could create subject headings for indigenous knowledge systems.

Creating appropriate subject headings for indigenous knowledge calls for collaboration. To do this, Chisita (2011) urged information professionals to collaborate with indigenous experts, opinion leaders and experts in the respective field to provide appropriate indigenous content. Even if the current knowledge organization systems cannot accommodate indigenous subject headings in its present state, agreeing with Ngulube (2002:98), information professionals can use their expertise to the best advantage in compiling bibliographies of IK resources, and developing standardized tools for indexing and cataloguing IK to make indigenous knowledge usable and accessible. If there was collaboration amongst experts in various fields to identify which IK is relevant to document, then they can come up with appropriate term translated for its effective organization.

5.8 LIBRARY PROGRAMMES AND SERVICES

The first focus under this theme was to assess programmes by the library to document and manage indigenous knowledge. The factors considered were library's outreach programmes, the content

and focus of the outreach programmes, library and community partnership, library services to indigenous communities and the libraries social responsibilities within the communities they were located. Library services as defined by Mhlongo and Ngulube (2019) are activities that libraries undertake to serve their user communities. These services as explained include referencing, circulation, inter-library loans, information searches and current awareness services to outreach programmes. For its management and preservation, libraries as recognized by IFLA (2012) are to implement programmes to collect, preserve and disseminate indigenous knowledge resources. Most of the programmes initiated by the libraries were outreach programmes specifically to help develop community and school libraries within the communities the libraries were located. There were also reading clubs that were set up within the community schools and during such activities, the librarians supported and encouraged reading amongst the pupils. However, none of these programmes was geared towards the management of indigenous knowledge.

Presumably, in terms of service provision, the libraries although opened to the public did not have any peculiar services for indigenous communities. Although library services such as referencing and information searches were opened to both registered and non-registered users, there were restrictions for non-registered members. They couldn't borrow resources to use outside the library. There was no relationship or collaboration between the libraries and the communities nor any efforts been made towards that. The libraries programmes and services were basically for its primary users including library week celebrations which focused on publicizing the library resources to their users. During such celebrations, some of the universities that had radio stations on campus, used such platform to publicize and market the library resources and services. Some of the universities also do exhibitions of their resources to their user community.

The library's social responsibilities to the communities around were either donation of books to the community schools. The lack of any initiative by the libraries to provide service to indigenous communities towards the management of indigenous knowledge is cause for concern. The fact that the focus of these academic libraries was on their core users whose information needs may not be

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focused on indigenous knowledge is also disturbing. However, this does not rule out the fact that as centres of research and academic excellence, the university libraries should be biased in the type of information provision but provide a space where there is inclusion of various knowledge systems to coexist. The need for diversity in information provision and access is an added advantage to academic libraries as agents of transformation and social inclusion in service provision. Thus, for diversity, inclusivity and transformation, agreeing with Nakata (2003) information professionals can create ways to integrate IK within current library systems.

The focus on integration of IK into library services and programmes requires the need for community partnership for its success. Building such relationships according to Thorpe and Bryne (2016:18) ensures inclusion of more and stronger indigenous voices to reflect on past and contemporary indigenous experiences. However, the nature of library programmes and services in academic libraries in Ghana reflects more on the university's curriculum than the inclusion of other knowledge systems that reflects on the African content of knowledge.

5.9 INTEGRATION OF INDIGENOUS KNOWLEDGE INTO LIBRARY SERVICES

Integration of IK into library services was instrumental in developing a framework for the management of IK in academic libraries. By integration, the focus was on integrating IK into library services as was suggested by Mhlongo (2018).To know whether the management of IK was integrated into the library's services, it was important to know whether IK was considered as an intellectual asset and the responses of the wider majority was in the affirmative. When asked to give reasons why respondents considered IK as an intellectual asset, they stated informal education, preservation of cultural heritage, research purposes, sources of information, knowledge acquisition and development. These reasons reflected the very nature of IK within communities as knowledge that is seen as a strategic resource and forms the basis of the everyday living of people relating to health, agriculture, education, natural resource management, conflict resolution, festivals and various activities (UNESCO 2017).

In terms of representation of IK materials in library's collection, majority of the respondents noted that IK materials were not represented in the library because IK was not the focus of the library's collection, IK was not covered by the university curriculum and the fact that they only managed documented information. These reasons were emphasised by some of the university librarians who noted that the curriculum and teaching models in the universities did not create the avenue for the management of IK and so the libraries did not have strategies in place for its management. From the perspective of participants and agreeing with Mhlongo (2018:166), the nature of IK as oral, tacit and undocumented is a deterring factor for its integration into library services. So, although IK was seen as an intellectual asset used in communities, its nature makes it to be continually marginalised especially in Ghanaian universities where everything is modelled after western and documented knowledge. This generally defeats the call for social inclusion, equality, social transformation and sustainable development which embodies integration. Most of the libraries had a department for managing materials from African authors called the Africana/Special collections. These collections were deemed rare collections because they contained interesting publications on history, novels, and other historic events on audio/cassette/CD-ROM, microfilm etc. which were local content. The libraries had indigenous collections in the form of books, magazines, newspapers, and journals that were published.

By integration it was necessary to find out whether librarians besides managing documented information in their custody, go into communities to collect, document, manage and preserve their indigenous knowledge in its tacit nature for posterity. This was because indigenous knowledge as agreed by participants is becoming extinct and needed to be preserved. The people to do it best are the information professionals whose mandate is managing and preserving information. The need for integration also calls for capacity, expertise and resources to do it since it is not their core mandate and they are not obliged by any policy to do so in Ghana. Whichever way one looks at it, information professionals should just collect IK in collaboration with expertise and once users get to know that such information is available, they will request for it and use it. Indigenous knowledge management could be seen as one of the most effective way the library can be seen as being proactive. This concurs with the opinion of Mahwasane (2017:77) that libraries should see the

management of indigenous knowledge as an additional responsibility and service in the innovative application of indigenous knowledge

Makinde and Shorunke (2013) clearly elaborate that since libraries are seen as providers of information and its resources, they need to collect information in various formats, organize (creating inventories, bibliographies, cataloguing/classification/ indexing/abstracting), preserve, create original information, repackage the information and disseminate it to users through user-oriented services. As the storehouse of knowledge, libraries must take up the challenge and devise strategies to collect, document, manage and preserve IK (Okore et al 2009; Mahwasane 2017:78). For example, alternative medicine plays a very important role in primary healthcare in most indigenous societies. To add up agriculture also contributes a lot to African economies and most of these practices adopt indigenous techniques. It is a known fact that apart from the core collections of academic libraries based on their taught programmes, about five to ten percent of these collections are general knowledge so the library could venture on the collection and management of IK as a special project and a way to contribute to the communities within which they are located. Thus, integration of indigenous knowledge into library services is one of the innovative ways' libraries can adopt. Attesting to Omekwu and Ugwuanyi (2009), libraries have become more vital in the age of information explosion and as access station organization to global information that is appropriate in education, research and national development. Thus, the need for diversity in information provision, access and dissemination. The management of IK in academic libraries calls for its integration into the library services and programmes. This is the only way to ensure the transformation of knowledge systems, equality, social inclusion and achieve sustainable development by adding indigenous voices to decision making and development agenda within communities. Thus, the management of indigenous knowledge.

5.10 STAFF TRAINING PROGRAMMES ON INDIGENOUS KNOWLEDGE

The quest to integrate the management of IK into library services calls for staff who are competent and have the requisite skills and knowledge to manage indigenous knowledge. it was very obvious that majority of the heads of units stated that they had no training programmes specifically on the management and preservation of indigenous knowledge. Staff training programmes were embedded in continuous professional development programmes through workshops, seminars and in-house training on improving the knowledge and skills they have and adopting emerging trends and topical issues in the profession to enhance their skills on the job and also improve service delivery to users.

The trainings came in diverse ways, but the focus was on whether there had been training programmes on indigenous knowledge were done. It was gleaned that there had not been any training on indigenous knowledge management or preservation. Such trainings organised by the library association in Ghana had been done but none of these trainings had indigenous knowledge management as a focus. It was suggested by one participant that if the library association takes it up and conscientize information professionals on the importance and need to manage indigenous knowledge, then members will have the understanding and their interest for the management of indigenous knowledge will develop from there. But currently, the university library's training programmes for staff does not focus on IK. This is because the primary focus of these libraries is not on the management of IK. Again, training comes at a cost and with the limited budget the libraries are allocated, they rather focus it on trainings to enhance the services and nature of resources they provide to their user community.

5.11 TOOLS AND EXPERTISE NEEDED FOR THE MANAGEMENT OF INDIGENOUS KNOWLEDGE

Information professionals as part of their training would have acquired some skills in managing information from their creation, maintenance through to their preservation and the different media on which the information is stored in both print and electronic format. It becomes quite easier to train people with such background on how to manage other forms of information and therefore equip them with the skills for curating and managing informal knowledge. Do information professionals have the requisite skills and competency to manage indigenous knowledge in academic libraries, when all they are used to is managing documented information? Participants indicated they had the skills to do so. To be certain about these responses, participants were asked to indicate their level of competency in certain areas that were required for the effective management and preservation of indigenous knowledge (*see Table 4.12*).

It was evident from the responses that participants had fair competencies in transcribing, codification, translation, video/photo editing and media literacy. However, when it came to competencies in areas such as computer literacy, managing databases, digital literacy, digitisation, preservation management, indexing/abstracting, cataloguing and classification, they had very good competencies in such areas because these were the daily routine of staff at the various units and so it was not surprising to know they had great expertise in that. If the library intends to take on board managing indigenous knowledge, then it would require building the capacity of staff on how to manage and preserve informal knowledge such as IK and by extension as suggested by Sarkhel (2016:437), work on the legal implications that comes with managing and preserving indigenous knowledge. Since expertise is something that can be developed, there is the need for advocacy in accepting to manage indigenous knowledge once there is the potential and the goodwill from information professionals.

For information professionals to wholly embark on managing indigenous knowledge, it is important to train them in areas where they may lack the expertise especially with the collection and documentation of tacit knowledge. Cataloguing/classification, indexing/abstracting and dissemination of information is something that librarians do and so these same principles used at the library may be applied when it comes to indigenous knowledge management. Ensuring inclusion, equality and diversity of knowledge globally requires information professionals to possess some skills in digitisation, computer literacy, metadata management, digital literacy among others to promote indigenous knowledge (Ozioko, Igwesi & Eke 2011).

5.12 INDIGENOUS KNOWLEDGE AND EDUCATION

The African form of education until the introduction of western education was an integrated experience, emphasized on social responsibility and was very participatory (Chinaka, Iwuoha, Abdullahi and Aniedu 2015:60) and this was significant to every aspect of people's way of learning and living in agriculture, education, health and medicine, natural resource management, conflict management, leadership amongst others. The interesting part was the fact that all of these experiences were transmitted orally. However, the advent of formal education with the introduction of western and scientific system of knowing where everything accepted as true and must be documented and validated requires IK to also be documented and preserved for posterity. The call for integration of IK into formal education calls for the need for it to be captured, documented, managed and disseminated via means that will be made accessible to those who may need it whiles ensuring that the rights of owners of IK are protected.

To dissect and understand the place of IK in the academy, the curriculum of universities comes into play as to whether IK is included in the curriculum or not. That is the starting point to know the extent to which the libraries were involved. Consciously, IK may not be formally a part of the universities curriculum but are reflective in areas such as agriculture and African studies (which includes history and the performing arts). Indigenous knowledge systems are also reflective in

higher education through some research where data are collected on indigenous matters. To answer the questions and concerns raised by Mapesela (2004), it is quite obvious that indigenous knowledge systems by their nature are not well understood enough to be formally integrated into higher education and earn a space in modern science in Ghana. In resolving these concerns so far raised and contested, respondents opined that IK could be incorporated into the information literacy courses facilitated by information professionals in the universities and through that it can become part of the teaching of information literacy. As stipulated by Ngulube et al (2015), Chisita and Abdullahi (2010), another starting point for the inclusion of IK into education is the integration of IK into library and information science programmes to equip students with the skills and expertise of managing and preserving IK.

The move for the inclusion of IK into education does not mean the neglect of the educational systems that have existed throughout the years. As Anwar (2011:146) practically puts it as "breaking the knowledge barrier" is a quest for universities in Africa to create an enabling environment that embraces all knowledge systems to articulate their concepts and claim their space to derive their legitimacy and identity within their research and teaching programmes. Of course, there were some of the university courses that reflected indigenous knowledge systems by nature, yet the teaching delivering methods did not make room for the integration of IK. This is because as posited by Appadurai (2006), the advancement of globalisation creates a big contrast between university education and indigenous ways of knowing and agreeing with Marker (2017) bring about inequality between university education and indigenous communities.

The education system in Ghana is based on foreign curriculum that has roots in the colonial legacy. This makes no room for the inclusion of indigenous knowledge systems. From the findings, respondents noted that if indigenous knowledge was included in the curriculum of the universities, then it will mandate librarians to collect it and present it in a form that can be accessible to users. Its exclusion from the curriculum does not encourage its collection, documentation and preservation. This attest to the fact that indigenous knowledge irrespective of its intellectual

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richness is highly marginalised. How then can this gap thus be bridged to make the African voices heard and include local content in our education system? For inclusion of IK into our educational system, Dei (2000) contends the need for the people and for all stakeholders to recognize that these two knowledge systems can coexist and complement each other. Concurring with Dhewa (2011), indigenous knowledge system can coexist with western knowledge through documentation and translation which involves partnership with all stakeholders. This requires a change management approach to a place of connectedness as explained by Marker (2017) where both indigenous and western knowledge can be emerged where necessary and integrated into our educational system.

The information professional's role in managing indigenous knowledge at the university is guided by the university's curriculum which informs the collection development policy and allocated budget. However, another problem with the curriculum development in universities is the fact that most of these universities in Ghana do not have a central curriculum development department to look at courses that have an aspect of indigenous knowledge systems so that they can be integrated into mainline courses. Looking at these difficulties to ascertain which subject includes IK or not, IK should be incorporated into library and information science curriculum (LIS) because of its focus on organizing, preserving, and disseminating information and knowledge resources irrespective of the format (Ngulube, Dube & Mhlongo 2015; Chisita & Abdullahi 2010). This starts with policy makers within the universities because universities have a responsibility to indigenization and can play a crucial role in the development of indigenous knowledge systems by establishing centres within the universities that will act and facilitate collaboration between stakeholders for the development of IK (Mekoa 2015). This also involves capacity building to promote the integration of indigenous knowledge systems.

5.13 INDIGENOUS KNOWLEDGE AND SUSTAINABLE DEVELOPMENT

One key drive to sustainable development is the need for local content development (Ozioko et al 2011:58) and as asserted by Mutula (2007), the challenges faced by Africans to achieving

sustainable development in addressing their needs is the lack of African content of information and knowledge systems because every solution adopted to resolving problems in Africa is basically western-centered and external. Local content is locally generated knowledge peculiar to a community. It includes their culture, craft, artefacts, food, agriculture, religion and beliefs etc. It embraces the totality of a culture and an important platform for people to express, share, adapt and communicate on issues that affects them (Ballantyne 2002; Mutula 2008; Ozioko et al 2011:59). This indigenous local content is a key factor for sustainable development in any society as to bridging the digital divide, empowering people's and communities' voices to be heard globally (Khan 2010). Development must be culturally relevant to address specific needs of society, thus the inclusion of indigenous knowledge in development decisions concerning a community. Furthermore, one of the key components to sustainable development is access to local content.

The role of indigenous knowledge is invaluable and its potential to cuts across diverse areas such as agriculture, medicine, education, conflict resolution/management, cultural identification, environmental conservation, security, skills acquisition and entrepreneurship provides answers to indigenous development. From the responses, participants indicated that indigenous knowledge had a direct relationship to development and its inclusion in these areas amongst others will ensure sustainable development. They agreed for collaboration with experts in various discipline and fields to collect, manage and preserve IK for sustainable development. Indigenous knowledge is a contributory factor for sustainable development. This translates to the fact that global economies are continuously acknowledging that development cannot be sustainable without integrating indigenous knowledge to the development process (Chinaka et al 2015:61), a factor which was also expressed by some of the participants.

Indigenous knowledge has the same critical role to societal development like any other knowledge resource. Almost all development initiatives and project elaborate on human capital to support socio-economic development. This human capital and knowledge come from different sources, most significantly indigenous knowledge. Development should be culturally relevant and so if a

country pays attention to its indigenous knowledge systems such as herbal medicine and agriculture for example which many people in local communities are knowledgeable about, it brings enormous benefits to the health delivery system and also boosts the economic activities of such communities. Employment creation is an example of such. If enough attention is paid to the kind of food that is produced in a country, it has implications for food production industries which would target indigenous foods. Until these mindsets are embraced and used in our teaching, learning and research, we would always be relying on outsiders and foreign developed knowledge systems for our development, which unfortunately may not be relevant in many aspects.

How then does the library come in with issues of sustainable development? The information professional's role comes to play according to IFLA (2013) as a reliable mechanism for underpinning the delivery of sustainable development programmes as the provider of access to the world's knowledge and information content and networked services that underpin sustainable development. It therefore behooves on information professionals to start curating IK in areas that are beneficial to their communities at large and bring it to the attention of the users and in this regard academic staff, students and researchers as a way of disseminating it. Once users become aware that such knowledge systems are documented and available when needed, they will request for it. This could also be another way of publicizing and marketing IK to users and the public at large. Concurring with Ngulube (2002:99), it is assumed that users will utilize IK resources if they are aware of their existence. In instances where the library adopts a user-centered approach in providing information resources, users can also start making demands for IK which will force the library to make such information available. Whichever, way one does it, what is key is that we have something, a particular type of knowledge resources which is rich but nonetheless neglected, which will inform the teaching delivery programmes we have in our universities and make education more relevant to the socio-cultural needs of Ghana.

5.14 INDIGENOUS KNOWLEDGE AND INTELLECTUAL PROPERTY RIGHTS

Intellectual property right is key to the management of indigenous knowledge. In most indigenous communities, indigenous knowledge is predominantly the main source of people's livelihood and so all the necessary measures have to be in place to prevent it from overexploitation. It has therefore become necessary to protect and make room for the owners of indigenous knowledge to enjoy every economic benefit and recognition that comes with its usage. Intellectual property right are issues that can be addressed by information professionals because libraries as agreed by Mahwasane (2017:79) also promote users' and creators' rights. Thus, negotiating issues on intellectual property rights is not something that is beyond them. From the findings, majority of the respondents believed copyright was the best intellectual property right to apply to the use and management of indigenous knowledge.

The ethical aspect of using indigenous knowledge is important and cannot be overlooked. As a matter of fact, intellectual property right could be a hinderance in an attempt to manage indigenous knowledge. Amongst the reasons given by respondents in applying intellectual property right were to promote the use of indigenous knowledge, financial gains to owners of indigenous knowledge and to prevent overexploitation of indigenous knowledge. This concurs with the findings of Simone (2004) that it has become necessary to protect indigenous knowledge because communities that own it must benefit from the knowledge whether financially or by simply gaining recognition. Copyright as the intellectual property law that must be applied to indigenous knowledge from the perspective of respondents was because it protects owners economic and morale rights. Some respondents, however, had a different perspective and were of the view that intellectual property law should not be applied to the use of indigenous knowledge because it may place limits on its use, raise risks of lawsuits and may pose difficulties in enforcing intellectual property laws. Agreeing with Masango (2010) not all forms of indigenous knowledge can be protected within intellectual property such as myths, traditional beliefs, superstition, customs and stories because respondents believed that will restrict usage and not produce the kind of effect we anticipate. The process of acquiring these rights in itself are quite rigorous. In addition, Sithole

(2007) notes the inadequacies in many property rights which have failed to protect indigenous communal knowledge which is significantly not tied one person. To achieve the goal of applying intellectual property rights, the call for collaboration amongst all stakeholders becomes paramount in the sense that each will apply their expertise where needed to protect indigenous knowledge and prevent its overexploitation.

5.15 INFORMATION COMMUNICATION TECHNOLOGIES AND INDIGENOUS KNOWLEDGE SYSTEMS

The call to document and preserve indigenous knowledge requires the use of appropriate tools and available technology for its documentation, storage, use and dissemination. ICTs thus play a very instrumental role in such situation. It is an undisputed fact that indigenous knowledge can wholly and effectively be managed. With technology, knowledge can be captured, stored and disseminated in conventional forms (Njiraine & Le Roux 2010). By this, Chinaka et al (2015:63) propose the application of ICT security mechanisms by information professionals for access control in order to prevent the overexploitation of indigenous knowledge. Mhlongo and Ngulube (2019:13) agrees that information professionals must be innovative and use ICTs to address the information needs of indigenous communities because technology is a key instrument to share information on indigenous activities and practices (Chinaka et al 2015:63).

The form in which information is accessed and used in libraries currently is shifting towards the use of electronic resources and even with printable resources such as books, whose versions are created electronically in the form of e-books. Technology is the new trend in recent times to disseminate information, access and use it in a timely, reliable and cost-effective way. Dlamini and Ocholla (2018) address this by adding that societies recently rely heavily on ICT tools to manage both tacit and explicit knowledge. All the traditional functions that were manually done in libraries such as cataloguing, classification, acquisitions etc. are all done electronically using functional and appropriate technology. Just as in extant literature (Ngulube 2003; Sithole 2007; Lwoga et al 2010; Chinaka et al 2015; Onyemaizu 2015; Sarkhel 2016; Dlamini & Ocholla 2018;

Mhlongo & Ngulube 2019), participants agreed that ICTs were one of the most useful tools to capture, store, access and disseminate indigenous knowledge in different aspects and field.

The use of ICTs spans across various sections of knowledge management as it has been tested and approved by scholars in the field as the appropriate technology to manage tacit knowledge (Ngulube 2003; Sithole 2007; Lwoga et al 2010; Chinaka et al 2015; Onyemaizu 2015; Sarkhel 2016; Dlamini & Ocholla 2018; Mhlongo & Ngulube 2019). Nonaka (1994) established that tacit knowledge can be converted into explicit knowledge and vice versa using knowledge management models through the processes of socialisation, externalisation, combination and internalionalization using ICTs. This was agreed by Ngulube (2003) and Lwoga, Ngulube and Stilwell (2010) that indigenous knowledge can be communicated, documented, codified and preserved using conventional means. Earl (2001), Njiraine and Le Roux (2010) also acknowledged the use of conventional methods to manage, disseminate and preserve indigenous knowledge. Thus, the principles of knowledge management can be used as a framework for the management of indigenous knowledge using ICTs.

In terms of ICTs and its use, the libraries were all automated and thus equipped with various ICT tools and so the focus was to assess the level of competencies with the use of ICTs and its infrastructure. The variables used were computer literacy, digital literacy, media literacy, documentation, transcribing, codification, video/photo editing, managing databases, digitisation and institutional repositories. The responses clearly showed that respondents had a fairly good competencies in these areas and with additional training, they can be equipped to the task. The universities also had a very good ICT infrastructure for sharing and allocating resources to its users and these could be adopted and used to manage indigenous knowledge as well. The digitisation and institutional repository units of the libraries were equipped with tools that were used for recording, videos, scanning and editing. The institutional repositories used to archive various forms of knowledge by the universities could also be used to manage documented information. A community could be created on the institutional repository to store and disseminate IK because the

institutional repositories are visible and accessible to users and there are sections that are put in the public domain. Additionally, since the institutional repositories of the universities measure their web visibility, and highlights their research output on the web, it can be adopted as a database for the management of IK because they are managed by information professionals. Besides, the libraries can use their social media presence to advocate, market and disseminate the usefulness of IK to the public.

5.16 CHALLENGES TO THE MANAGEMENT OF INDIGENOUS KNOWLEDGE BY INFORMATION PROFESSIONALS

Amongst the challenges enumerated by information professionals were management buy-ins, financial constraints, focus of library's collection, intellectual property, IK not part of the university's curriculum, lack of appropriate technology, lack of human resource with required expertise and the lack of interest on the part of the information professional. The tacit nature of indigenous knowledge poses a lot of challenge for the information professional within the settings of academic library. By this, Chinaka et all (2015:61) points out the fact that the method of gathering indigenous knowledge is through oral traditions. This is far from the nature of materials gathered and managed within academic libraries. The nature of materials managed in academic libraries are mostly documented information in both print and electronic format. Mhlongo and Ngulube (2019:10) confirms that libraries provide more of print materials although they provide materials in other formats. This was also evident from the fact that a host of resources housed by the libraries were print materials.

Information professionals here are guided by their collection development policy which spells out what materials they should acquire and with a specific budget allotted for it by the management. Academic libraries collections are also focused on the institution's taught courses. By implication, once the collection development does not spell out the collection of some particular information, it becomes difficult to acquire them with budget constraints. In the midst of these constraints, it is

very possible for information professionals to manage IK by documenting IK in other formats that can be accessible to users. One way as explained by Chinaka et al (2015:63) is capturing IK through audios, videos and electronic networking for its access and dissemination. It is worth noting for information professionals to be aware that there is no one approach in documenting IK and so they can adopt different techniques to capture such knowledge. This can be achieved through stakeholder's collaboration and agreeing with Sarkhel (2016:434) and Ngulube (2002), information professionals need to collaborate with relevant subject experts to record and apply indigenous knowledge successfully. The need for this partnership is key because these experts in diverse fields would know the kind of information to collect and the questions to ask to get relevant information for users' consumption.

In their quest to organise and manage information to meet their varied user's information needs, the information professional is guided by a collection development policy and an allocated and approved budget to streamline their activities. How then can the management of indigenous knowledge be incorporated when it is traditionally not the focus of academic library's collection? Is the collection development policy of academic library's restrictive? Certainly, indigenous knowledge can be incorporated into the collection development policies of libraries because these policies are prone to modifications over a period of time. In most academic libraries, they review their policies over at least every five years to make room for diversity, additions and expansion of their collection to suit the emerging trends in information science and make room for new curriculum that had been added to the courses offered by the universities. In the face of these changes, the libraries can make room for the addition of indigenous knowledge as part of their collection looking at its value for teaching and research and focus part of their budgets on it. As expressed by one participant, IK can form a part of their general collections which may be of interest to users, as they collect materials on general topics as well for the interest of their users. Another participant suggested that IK can become part of their collection if they group it under library projects to attract the attention of donors who may be interested to give grants for such projects.

By focusing on both options, it can become much easier for academic libraries to purposefully design a collection development policy for indigenous knowledge. But in doing so, Sarkhel (2016:431) and Ngulube (2002) emphasize that information professionals should develop these policies with experts in various subject areas of interest such as historians, ethnographers, anthropologists, botanists, zoologist to collect, organize, document and disseminate indigenous knowledge in collaboration with the custodians and owners of IK. This will ensure that things are done in an appropriate, systematic and meaningful way involving all stakeholders. Although IFLA (2012) recommends libraries to implement programs to collect, preserve and disseminate indigenous knowledge resources, the lack of national policies to mandate information professionals to do so does not support its initiation in academic libraries. Information professionals have no excuse regardless of the type of library, as the library keeps expanding with emerging trends in the now information society, they need to be pioneering and pre-emptive. Concurring with Mhlongo and Ngulube (2019:13) libraries need to find ways of serving the varied users in line with their mission of inclusivity and also be innovative.

Other deterrent factor to the management of indigenous knowledge is the lack of interest on the part of the information professionals. To enact the management of indigenous knowledge in Ghana would require lots of advocacy and publicity strongly supported with strategic objectives as to why the management of IK is important. This requires lots of management buy-ins which will require lots of pushing from the management of the libraries. Where there is no interest on their parts would mean failure for its acceptance. Because indigenous knowledge is not integrated into the university's curriculum and generally formal education in Ghana, it presents chasm in the learning process coupled with the challenge as to whether academic staff would be prepared to integrate it into the teaching delivery programmes. However, although integrating IK into formal education may be quite challenging, it is possible. IK as suggested by Mapesela (2004) could be acknowledged as history. Expressing alternative opinion and identifying aspects of IK that would contribute to higher education as pointed out by Reddy, de Beer and Peterson (2011), Mosimege (2005) proposed that IK could be categorized into the library's collection as part of history, culture and environment which cuts across the various kinds of IK. In order to coexist with other

knowledge systems and for its integration into formal education, placing the management of IK under library and information science curriculum according to Ngulube (2015), Onyemaizu (2015) and Dhewa (2011), Chisita and Abdullahi (2010) will not only equip information professionals but also put the management of IK into perspective because of the focus of library and information science on the management, use, maintenance, dissemination and preservation of information.

Technology plays a major role in documenting, storing, access provision and dissemination of information. Indigenous knowledge is not left out because ICTs makes it possible to capture IK through documentation on various media, storing and sharing the information on databases, servers and other storage media and disseminating the information via radio and the internet through networking infrastructure. With all these benefits, the issue of network traffic, internet connectivity, technology obsolete and inadequate skills with the use of technology can be a constraint. In addition, and as explored by Dlamini and Ocholla (2018:149) computer literacy, digital literacy, information literacy, affordability and sustainability of technology, access and security also poses major challenges with the use of ICTs. It is therefore important that ICT becomes useful to the information professionals and concurring with Chinaka et al (2015:63), countries should make ICT a powerful enabler for managing, preserving and disseminating information on indigenous activities and practices while applying security mechanisms to control the rights and access to indigenous resources. ICTs also promotes the development of local content on the web and as attested by Ozioko et al (2011:60), ICTs has brought a paradigm shift in information management. Information professionals can thus take advantage of these and include indigenous knowledge content on the web. The problem of cost with the use of technology and bandwidth problems can be absorbed by the libraries since they are equipped with the infrastructure, connectivity and associated ICT resources. Because academic libraries are equipped with ICT resources, they can use it efficiently and productively to serve their users. As rightly put by Mhlongo and Ngulube (2019) information professionals can explore best practices in expediting access to indigenous knowledge.

In ensuring that indigenous knowledge is appropriately utilized, well managed and preserved, the interest of the owners of the knowledge should be considered. In describing applicable intellectual property rights to protect owners of indigenous knowledge and its overexploitation, copyright and patent were the common laws most participants indicated had to be applied to the management of indigenous knowledge once the knowledge is refined through documentation. There are a lot of economic benefits that can be accrued for owners of IK and this can be ensured when royalties are paid by users in accessing indigenous knowledge. This can be implemented through stakeholder agreement and according to Chinaka et al (2015:63), information professionals could lead this without compromising the principle of global partnership. Notwithstanding, some respondents were of the view that applying intellectual property especially through patent will restrict access. But just as the use of western knowledge is not free, measures can be put in place to also make economic benefit from indigenous knowledge for the benefit of its owners. Thus, applying intellectual property will limit its overexploitation.

5.17 SUMMARY

This chapter focused on adding meaning and the researcher's perspective on the data presented and analysed comparing with existing literature. An integrated approach was used to interpret the findings. Results were interpreted according to the themes that were developed from the objectives as previously used. The overarching objective of the study was to develop a framework for the management of indigenous knowledge in public university libraries in Ghana. In order to achieve this objective, certain questions which guided the study needed to be answered to serve as a guideline for the development of the framework.

The mission of the universities was to provide higher education, undertake research, disseminate knowledge and foster relationships with the society and outside world. The scope and focus of the library's collections were based on programmes offered and taught at the universities. The concept of IK, its awareness and understanding were well articulated. Its features such as the tacit nature, rooted in a particular culture, traditional and local, dynamic and adaptive to change, community-

based knowledge, uniqueness and the fact that it was difficult to codify were also confirmed in the study.

In terms of policies and frameworks governing the management of IK, it was ascertained that there were no policies to this effect. Again, the knowledge organization system used in the libraries to classify and catalogue knowledge because it was expandable could be used for indigenous subject headings. Likewise, the information professional could use their expertise in compiling bibliographies of IK resources and develop standardized tools for indexing and cataloguing IK to make it usable and accessible. The libraries did not have any programmes or services towards the management of IK. Additionally, the management of IK had not been integrated into the library's services. Staff had also not had any training on indigenous knowledge management systems. There were tools and expertise in related knowledge management systems and so with additional training, information professionals would acquire the requisite skills for the management of IK if pursued. It was further determined that the inclusion of IK into formal education would make provision for its integration into the library's collection. It was added that IK was also vital to sustainable development because it cuts across diverse areas of the economy and if well harnessed has a lot of benefits to the development process.

Intellectual property rights as was established would protect owners of IK, provide them with economic benefits as a source of revenue and prevent the overexploitation of IK to the advantage of external users. In relation to capturing, storing, providing access and disseminating IK resources, ICTs were seen as the appropriate tools for such purposes. Apart from the benefits from the use of IK and the need to manage and preserve it, lots of challenges were also identified in the study which could be overcome if systems are put in place for its management. The next chapter looks at the conclusions and recommendations drawn from the study.

CHAPTER SIX: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

The study sought to develop a framework for the management of indigenous knowledge in public university libraries in Ghana. To achieve this, the researcher was guided by the objectives of the study from which the research questions were developed, and data collected. Data collected was analysed and further interpreted to make meaning out of the research findings. After adding meaning to the research, it is important to summarize the findings, draw conclusions from it and make recommendations that can be generalized in context. This chapter draws on the previous chapters to make conclusions and recommendations for the study. In achieving the objective of the study, these objectives served as the guideline:

1. To find out whether the mission of universities in Ghana include aspects on the effective management of IK towards sustainable development in Ghana.
2. To identify whether the management of IK is captured in the collection development activities of academic libraries in Ghana.
3. To identify the existing attempts at IK management in academic libraries in Ghana.
4. To identify the tools/expertise needed for the effective management of indigenous knowledge based on existing models.
5. To find out the challenges faced by information professionals in managing indigenous knowledge in academic libraries in Ghana.
6. To make recommendations based on the findings.

Themes were developed from the objectives to better explore the problem under investigation (*see Table 4.1*). The main objectives were discussed, and it reflects the themes that were used throughout the study.

6.2 SUMMARY OF FINDINGS

The findings showed that the universities aim was to promote education, research and learning and to achieve this they were guided by some strategic goals. The library's role in university education was to provide resources that supports teaching, learning and research. In order to achieve this, the

libraries also had strategic goals aligned with the main university's goals which included customer excellence, technology enhance learning, enhancing research, improving access to resources, develop and provide access to resources. In providing these information resources as a mandate of the libraries, none of it pointed to the management of indigenous knowledge. Indigenous knowledge was absent and non-existent in the list of resources that the libraries provided. There were no specific targeted resources for indigenous knowledge management because everything that the libraries did was modelled after western ideologies and concepts to the disadvantage of local content. The mission of the universities had no implications on the management of indigenous knowledge.

It was evident that information professionals were aware and understood indigenous knowledge systems, its importance and the indisputable fact that IK was gradually becoming extinct because it is largely undocumented. In expressing their understanding of IK, it was defined as local, traditional or non-scientific knowledge system of society or culture peculiar to the inhabitants acquired either consciously or unconsciously through personal experiences, local traditions, culture, history, innovations and forms a huge part of their very survival, guiding their way of life and across generations. Several features of IK were discussed as tacit knowledge transmitted orally, traditional/local/non-scientific knowledge, dynamic and adaptive to change, community-based knowledge transmitted from one generation to the other, rooted in a particular culture, unique to every culture or society and knowledge difficult to codify just as expressed in existing literature. It was also revealed that since IK was becoming extinct, there was the need to preserve it before it become completely lost. It was also clear that IK was dominant especially in the area of agriculture, alternative medicine/herbal medicine, festivals/ceremonies etc. With participants expressing the importance of IK in various disciplines, nothing pointed to the fact that it was integrated into the library's collection.

The libraries had a collection development policy that guided their selection of materials and deselection of materials, weeding, replacement of materials, interlibrary loans and consortia with

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other libraries. However, no aspect of it catered for the management and preservation of indigenous knowledge. Although, the collection development policies of most of the libraries were operational, they focused on what was spelt out in the policy. That is to collect information resources in both print and non-print format based on the university's curriculum. There were also no national policies in Ghana for the collection, management and preservation of IK and also with their limited budget, the libraries were not obliged in any way to pursue it.

The knowledge organization system used by the libraries to classify and catalogue their information resources was the Library of Congress. Participants were not absolutely sure but strongly believed that the Library of Congress system could offer a solution because it was expandable could make room for indigenous subject headings. It was also revealed that should the library of congress system not accommodate indigenous subject headings; information professionals could use their expertise in compiling bibliographies of IK resources and also develop standardized tools for indexing and cataloguing IK to make it usable and accessible. To do this better, the need for collaboration between experts in various fields to identify which IK is relevant and come up with the appropriate term for information professional also came up in the study.

The libraries had outreach programmes which were basically donation of books to community schools and also helping them to set up a school library. Other programmes organised by the libraries was their library week celebrations to market the library resources and services to their user community. The latter was organised internally. None of these outreach programmes was geared towards the management of indigenous knowledge. In terms of service provision, the libraries had no oversight responsibilities for the communities within which they were located. The libraries had also not initiated or made any attempt to collaborate with stakeholders within the communities to organise their indigenous knowledge.

Although information professionals considered indigenous knowledge as an intellectual asset which could be managed and preserved for posterity, its management had not been integrated into the library's collections and services. There were no attempts to integrate IK into the library's collection because it was not included in the university's curriculum. It was also established that because the teaching delivery methods and curriculum did not support the use of IK, it made it difficult to pursue it. The need for integration as stated by participants also called for capacity building of staff, resources and management buy-ins.

Moreover, information professionals at the universities had the competencies with information and knowledge management with the type of information they managed. With additional trainings, it was established that they could develop the expertise in managing indigenous knowledge especially with its collection and documentation where they lack the skills. The tools were at their disposure because the ICT and digitisation/institutional repository units had them and so it was something that they can take advantage of and use it in the management and preservation of IK.

It was also revealed from the findings that IK may not be formally a part of the universities curriculum but are reflective in areas such as agriculture, history, African studies (which includes history and the performing arts) and through some research where data are collected on indigenous matters. It was obvious that indigenous knowledge systems because of their nature, were not well understood enough to be formally integrated into higher education and earn a space in modern science in Ghana. The study revealed that IK could be incorporated into the information literacy courses facilitated by information professionals in the universities and through that it can become part of the teaching of information literacy. It was further established that the move for the inclusion of IK into education does not require the neglect of the educational systems that has been in existence over the years, but to create a space for it in academia where it can co-exist with other knowledge systems. The call for the inclusion of IK into university education will ensure that a space is created for it in the university's curriculum and its integration into the library's collection and services.

The findings revealed the importance of indigenous knowledge to sustainable development. IK cuts across diverse areas such as agriculture, medicine, education, conflict resolution/management, cultural identification, environmental conservation, security, skills acquisition and entrepreneurship. From the responses in the study, participants indicated that indigenous knowledge had a direct relationship to development and its inclusion in these areas amongst others will ensure sustainable development. It is therefore important for information professionals to start curating IK in areas that are beneficial to their communities at large. Once users become aware of its existence, they will definitely utilize it.

The ethical aspect of using indigenous knowledge was established to prevent the overexploitation of IK to protects owners economic and morale rights. Although not all IK can be protected using intellectual property laws, it was much applicable in areas such agriculture, herbal/alternative medicine, artefacts, natural resource management, conflict resolution etc. copyrights and patents were seen as applicable.

ICTs were seen as very efficient to manage and preserve indigenous knowledge, that is its documentation, storage, use and dissemination. It was also revealed that the universities also had a very good ICT infrastructure for sharing and allocating resources to its users and these could be adopted and used to manage indigenous knowledge as well. It was also revealed that the universities could use their institutional repositories as a database to manage, preserve and disseminate IK. The use of social media was also a good platform to advocate, market and disseminate the usefulness of IK.

Challenges that emanated from the study were management buy-ins, financial constraints, focus of the library's collection, intellectual property rights, IK not being part of university curriculum, lack of appropriate technology, lack of human resource with required expertise, and lack of interest on the part of the information professional.

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6.3 CONCLUSIONS ON DEVELOPING A FRAMEWORK FOR THE MANAGEMENT OF INDIGENOUS KNOWLEDGE IN PUBLIC UNIVERSITY LIBRARIES IN GHANA

The following conclusions were drawn from the objectives of the study as follows:

6.3.1 Conclusion on whether the mission of universities in Ghana include aspects on the effective management of IK towards sustainable development in Ghana

To find out whether the mission of universities in Ghana included aspects on the management of IK towards sustainable development, the following themes were explored:

- Mission, scope and focus of library's collection
- Indigenous knowledge and education
- Indigenous knowledge and sustainable development

The mission, scope and focus of library's collection was based on the curriculum and that was to support teaching, learning and research based on their taught and research programmes. Indigenous knowledge was not included in the universities curriculum and thus not integrated into the library's collection and services. The management of indigenous knowledge was not the library's focus nor primary responsibility. IK had lots of benefits and vital to sustainable development as was acknowledged by participants. However, this did not reflect in the library's collection. The mission of the universities and the library's collection did not include any aspect on the effective management of IK.

6.3.2 Conclusion on whether the management of IK is captured in the collection development activities of academic libraries in Ghana

This objective explored the following themes:

- Awareness and understanding of IK
- Policies and frameworks governing the management of IK
- Knowledge organization systems used in the library

There was awareness and understanding of IK, its characteristics and the fact that it was oral in nature and difficult to codify. There were no policies or frameworks for the management of IK in Ghana. None of the libraries had initiated it. The collection development policies of the libraries were focused on providing information resources based on the universities curriculum. It was anticipated that, the knowledge organisation system used by the libraries, that is the library of congress because it was expandable may make room for indigenous subject headings. However, in the absence of that the libraries could compile bibliographies and indexes of IK resources. Clearly, the management of IK was not captured in the collection development activities of the libraries.

6.3.3 Conclusion on the existing attempts at IK management in academic libraries in Ghana

To identify the existing attempts at IK management in academic libraries in Ghana, the following themes were used to achieve the objectives.

- Library programmes and services
- Staff training programmes on IK
- IK and sustainable development
- IK and Education
- Integration of IK into library services

The libraries had no services or programmes for the management of indigenous knowledge. Their outreach programmes were targeted at the community schools towards the donation of books, establishing reading clubs and in some cases helping them to organise their library. There were no training programmes for staff on indigenous knowledge management systems. It was established that as an intellectual asset, IK was critical to sustainable development if well harnessed. IK had been excluded in formal education and so was excluded from the university's curriculum and to a large extent the library's collection. IK was not integrated into the library's services purposely because it was not part of the university curriculum nor was it a primary focus of the libraries.

6.3.4 Conclusion on identifying the tools/expertise needed for the effective management of indigenous knowledge based on existing models

Information professionals have the skills and expertise in organizing and managing information but in relation to IK, certain expertise is required to gather such knowledge. To explore this the themes explored were tools and expertise needed for the management of IK and ICTs. It was established that although information professionals had expertise in managing information but with indigenous knowledge, they required additional training to collect and document indigenous knowledge which is tacit in nature. The tools in terms of ICTs and its infrastructure was available at the library and so it could be used for the purposes of collecting, documenting, storing and disseminating indigenous knowledge for its management and preservation. With the use of ICTs for such purposes, there were staff with the requisite skills on the use of ICTs.

6.3.5 Conclusion on the challenges faced by information professionals in managing indigenous knowledge in academic libraries in Ghana

Lots of challenges came up and with this section, all the themes were explored. The challenges that were identified from the study included management buy-ins, financial constraints, focus of library's collection, intellectual property, IK not part of the university's curriculum, lack of appropriate technology, lack of human resource with required expertise and the lack of interest on the part of the information professional. For its integration, it required decision made by all stakeholders and where management are not convinced means its exclusion from the library's resources. The libraries operated with limited budgets and so focused on the collection of materials based on the curriculum which was their primary focus. The focus of the library's collection was on documented knowledge. Some concerns raised was the issue of ownership with the collection and management of IK. IK was not incorporated into the university's curriculum and this consequently led to its exclusion from the library collection. Lack of human resource with the needed expertise on the collection and documentation of IK was also a challenge.

6.4 RECOMMENDATIONS ON DEVELOPING A FRAMEWORK FOR THE MANAGEMENT OF INDIGENOUS KNOWLEDGE IN PUBLIC UNIVERSITY LIBRARIES IN GHANA

The recommendations made based on the objectives of the study are as follows:

6.4.1 Recommendation on whether the mission of universities in Ghana include aspects on the effective management of IK towards sustainable development in Ghana

As centres of excellence and providers of knowledge through research output to foster relationships globally with the society, internal and external stakeholders, the universities should create centres for indigenous research as a starting point for the collection and documentation of IK. The universities must also consider all forms of knowledge as equally valuable and significant for teaching, learning and research. This can be possible where there is academic but-ins. And this advocacy must be spearheaded by information professionals to management and faculty. Advocacy must start from departmental level with heads of the departments and faculty.

Once there is a buy-in, the management will be more willing to provide resources for the collection and curation of these materials. Once these resources are provided and the library is able to gather it in collaboration with experts in diverse fields and indigenous communities, then there will be resources that will inform the teaching and learning delivery programmes of the university. So, it must start from the broad vision of where we want to go and then that vision feed through the management of resources and therefore to the teaching and learning programmes of the university. Working with the key players will be very important to have champions of IK who would be at the forefront of promoting this knowledge resources. And so, information professionals have the responsibility to take this on board. Because traditionally, it is an area that information professionals have neglected but have been trained to manage it and therefore they have to push it.

6.4.2 Recommendation on whether the management of IK is captured in the collection development activities of academic libraries in Ghana

Providing IK resources is a form of innovation in the library away from the traditional roles of library that people are used to. Information Professionals should come together and not do it in isolation to develop policies, standards on how to collect, organise, store and disseminate IK. It can first start from the library association level and once the awareness is created, information professionals can make it part of their collection development policies. The universities in collaboration with community leaders can educate community members of the importance of documenting their IK so they can fully participate in giving out the needed information. In developing the policies, it is vital to again engage community leaders and once they become part of such venture, they will be happy and willing to participate. Once there is a standard policy to serve as a guideline, its integration becomes easier because resources in terms of human capital, tools and finances will be budgeted for and generations of information professionals will adhere to it. The policy will also serve as a mandate and information professionals will be obliged to working with it.

6.4.3 Recommendation on the existing attempts at IK management in academic libraries in Ghana

The way forward is making IK part of the university curriculum. And it starts from making IK a part of library and information science curriculum. Universities in each region should collaborate with community leaders to identify which IK is peculiar and relevant to be collected and documented. This can be effective if information professionals first set up centres within the library for the collection and documentation of IK. Secondly, information professionals need to educate community members on the importance of managing and preserving their IK in collaboration with experts in various fields that makes use of IK. These experts could be selected as team leaders to facilitate the process. Involving experts will make it easier for the information professional because they are knowledgeable in the various fields and knows what needs to be documented because of its intrinsic and historical value.

6.4.4 Recommendation on identifying the tools/expertise needed for the effective management of indigenous knowledge based on existing models

Information professionals need to reskill so that they will be able to harness IK collectively to the advantage of owners of IK and Ghana as a whole. They need to acquire additional training on managing and preserving the oral and tacit nature of IK and examine the best way to do so. As was noted earlier, skills in digital literacy, media literacy, computer literacy, cultural awareness, oral traditions, documentation, codification, transcribing, translation, video/photo editing, digitisation, managing databases and preservation management will be vital to the documentation, management and dissemination of IK. This does not mean that information professionals should possess all these skills at a goal. These are functions that are reflected in the various units at the library so they can rightly be performed by staff at the various units with the requisite skills for easy integration and cutting down on cost that may be involved. Whiles others also concentrate on indexing, abstracting, classification and cataloguing which are the traditional roles of information professionals. Thus, collaboration of all units at the library with stakeholders will facilitate any integration effort.

6.4.5 Recommendation on the challenges faced by information professionals in managing indigenous knowledge in academic libraries in Ghana

Recognize that information is in different format. It is in one's language. It is all around us. There should be a willingness and ability to learn that managing indigenous knowledge is a community affair. Information professionals should let their curiosity guide them. There is so much around us within the communities. Policies are fine but if the leader does not recognize that, then we cannot make headway. Management buy-in is thus key here. If academic libraries are interested in doing a particular project, we can put up a proposal, raise funds, collaborate with a particular unit on how to go about the project. Then we will have a particular plan as to go to a particular community and collect their IK. information professionals cannot just get up one day and say they are collecting

information on IK. It has to be planned and done properly. And they will need resources both human and financial capital.

The way forward is for information professionals to sit down and identify which kind of information they want to collect. For example, what they think will be unique in the communities the universities are situated that should be collected because of its intrinsic and intellectual value. The need for partnership is very critical. Just like journalists do, information professionals could seek for stories and information. So, libraries could also take up those kinds of challenges, go out there to seek what is there to collect by way of indigenous knowledge and try to manage it. Afterall, information management is acquiring the information, storing it in the various formats and being able to disseminate or allow access to it as easily as possible. Any integration efforts will be successful where there is partnership between experts on the field, community leaders and information professionals. If such initiative is well established, then the library's role will be to;

- Create bibliographies, catalogues, indexes and abstracts for IK resources
- Prepare finding aids for IK materials
- Network to share and disseminate IK resources with other institutions through a consortium
- Provide online access through databases for access provision and use of IK resources
- Publicize and market the intellectual value of IK to stakeholders and users
- Put control measures in place in partnership with stakeholders to prevent the overexploitation of IK to the disadvantage of its owners.

6.4.6 Recommendation for the development of a framework for the management of IKS in public university libraries in Ghana
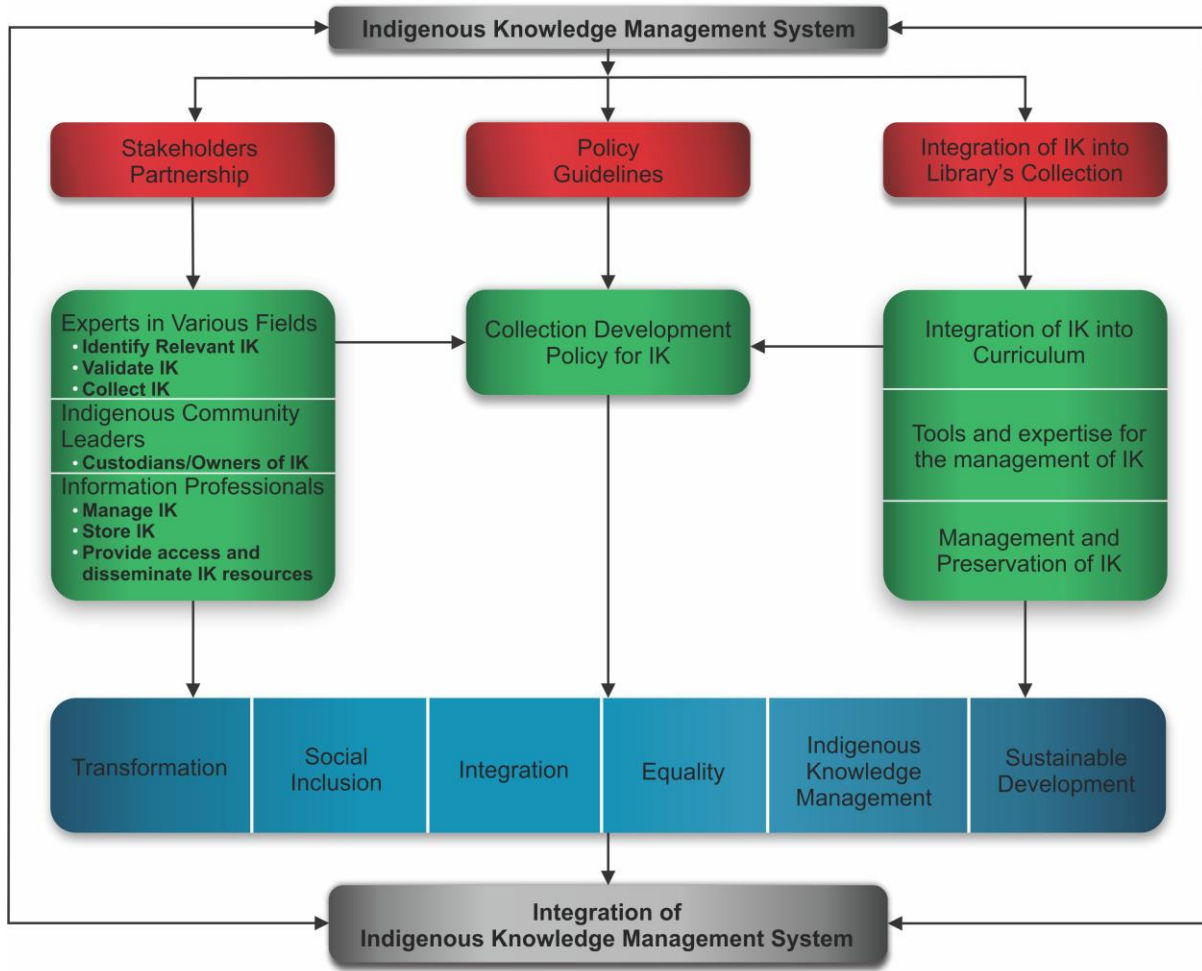
Figure 6.1: Proposed framework for the management of IK in public university libraries in Ghana

As part of the recommendation, the study sought to develop a framework for the management of indigenous knowledge in academic libraries which can be integrated into the library's programmes and services for its effective management in Ghana. This framework was guided by the conceptual framework that was adopted for the study (see chapter 2). The proposed framework is presented in figure 6.1 and concepts are explained in terms of its use by information professionals.

The purpose of the framework is to serve as a blueprint for information professionals in their quest to effectively manage all forms of knowledge including indigenous knowledge which is deemed an intellectual asset. The need for integration is based on the findings that there are no procedures to guide information professionals to integrate IK into their library collection, services and programmes because it is not the focus of their collection. Three core principles are identified in the effort to manage IK and integrate it into the library's collection. These are stakeholder's partnership, policy guidelines and integration of IK into library's collection with the aim of achieving transformation of knowledge systems, social inclusion of marginalised knowledge, equality, sustainable development for an integrated indigenous knowledge management system.

Stakeholder partnership calls for the collaboration amongst experts in various fields, indigenous community leaders and information professionals. It was evident from the findings that the exclusion of IK from the university curriculum has contributed to its marginalisation and underutilization (see chapter 4). Another factor that could affect stakeholder partnership in this sense is the lack of interest on the part of the information professional. Where the management of the libraries have an interest in indigenous knowledge management systems, they will push this agenda to the top-level management of the university where major strategic decisions are taken and enacted. Because IK is more of a community knowledge, any effort in collecting and managing it requires collaboration with the owners of such knowledge. the starting point in identifying and collecting this knowledge from society is involving indigenous community leaders. Indigenous community leaders are the custodians or owners of IK and so the knowledge resides with them. The experts include for example historians, researchers, scientists etc. who will help identify relevant IK, validate it and collect it in collaboration with community leaders. The role of the information professional is to manage IK, store the collected IK in the appropriate format, provide access and disseminate IK resources. All these cannot be done in isolation but calls for a collaborative effort from all the stakeholders.

Policy guidelines are important because they serve as a legislative framework within which entities operate. Information professionals are guided by budgets and the format or kind of information they manage depending on their roles. Thus, the need for a collection development policy that guides the collection management of academic libraries. Indigenous knowledge is broad and cuts across diverse aspects of society. It is thus vital in the integration and for its operationalization for academic libraries to define what they deem important to collect and manage for research, teaching and learning purposes since their collections are guided by their curriculum.

The integration of IK into the library's collection requires integration of IK into curriculum (which would have already been covered under stakeholder's partnership), tools and expertise for the management of IK, and the management and preservation of IK. For its total acceptance, it is key to identify areas where IK is useful in academia. Areas such as history, arts, agriculture among others. It is very important here to have the requisite tools in place and also train staff to manage and preserve such knowledge in the formats within which it is stored. Once the necessary protocols are in place, then it becomes easier for information professionals to manage and preserve IK in its form and nature for access provision and dissemination. The resulting end of these protocols is to achieve transformation, social inclusion, equality, sustainable development and to effectively have an integrated library where users can access all forms of knowledge.

6.5 FURTHER RESEARCH

The study sought to develop a framework for the management of indigenous knowledge in public university libraries in Ghana. A study of this nature required certain elements to be first explored and ascertained. The researcher thus makes the following suggestions for further research:

The study was limited to information professionals from the staff to management. To better understand the opinions of university management, it would be ideal to also get their perspective especially with the integration of IK into the university curriculum as well as the heads of the various department across the university. It is thus important to conduct further studies on such opinions.

The study also concentrated on academic libraries whose collections are focused on their curriculum. For the purposes of collaboration and effective integration, investigating the role of public libraries in ensuring the effective management of IK and as major stakeholders will go a long way to enhance the successes of any integration efforts. Besides public libraries are more focused on the information needs of the community.

Lastly, it would be ideal to explore the role of the library association in Ghana and the library authority to the management of IK. Perhaps the leadership at the association level can push this agenda to the ministry of education for the management of IK to be integrated into the library's collection, programmes, services and also for the institutionalization of national policies. Conducting a further study in this regard will be more beneficial in terms defining the roles and responsibilities of information professionals regardless of the type of library and the information resources they collect, manage and preserve.

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APPENDIX 1: CODES AND DESCRIPTIONS USED

Codes	Description
Awareness and Understanding of IK	This relates to the awareness of IK by information professionals (IP), their understanding and opinions on IK and its importance. It also looks at measures taken by IP to recognize IK, manage and preserve it and the challenges IP foresee with the management of IK in the libraries
Policies and Frameworks governing the management of IK	This code relates to the availability of collection development policy, its operationalization, its focus and whether there are national policies on the management of IKS
Knowledge organisation systems used in the library	This relates to systems used to catalogue and classify the library's collections
Library programmes and services	This refers to the library's outreach programmes and services, focus of library outreach programmes, partnership and collaboration with indigenous communities
Integration of indigenous knowledge into library services	This refers to the inclusion and representation of IK resources into the library's collection and services
Staff training programmes on IK	This refers to continuous professional development of staff both internal and

	external on IK at workshop, seminars and conferences
Tools and expertise needed for the management of IK	This refers to the competencies, skills and equipment that are available at the library for the management of IKS
IK and Education	This looks at the inclusion of IK into the university curriculum
IK and sustainable development	This refers to the role and relationship of IK to development. In addition, it looks at the role of IP to ensure the inclusion of IK in development projects and decisions
ICTs and IKS	This looks at the role of ICTs to the management and preservation of IKS

APPENDIX 2: INTERVIEW SCHEDULE FOR UNIVERSITY LIBRARIANS

Introduction

My name is Catherine Asamoah, and I am conducting a research for my doctoral studies supervised by Professor Patrick Ngulube at the School of Interdisciplinary Research and Postgraduate Studies (SIRGS) in the College of Graduate Studies and the Department of Information Science, at the University of South Africa. I am inviting you to participate in a study entitled "**Developing a Framework for the Management of Indigenous Knowledge Systems (IKS) in Public University Libraries in Ghana**". The study seeks to investigate the status and challenges of developing IKS in public university libraries in Ghana to develop a framework for its effective management. The study population involves all librarians, heads of units of the various departments in the library, senior and junior staff to provide the researcher with the needed information. The study involves semi-structured interviews with University Librarians, questionnaires for heads of units, senior and junior staff of each unit. Your participation will help the library come up with strategies to integrate indigenous knowledge into their collection to serve their varied users and also inform policy frameworks from stakeholders.

Participants are assured of anonymity and confidentiality through non-solicitation of their personal details. Information collected will be strictly used for research purposes.

Date and Time:

Name of Organisation:

Section A: Background Information on the Library

1. How long has the library been in existence?
2. What is the strategic goal of the library?
3. Who are the users of the library?
4. Is the library opened to outsiders?
5. What is the staff capacity of the library?
6. How many units do you have in the Library?
7. Is there anything you would like to clarify or add?

Section B: Awareness and Understanding of Indigenous Knowledge Systems

8. Are you aware of Indigenous Knowledge Systems?
9. If yes, in your opinion, what is indigenous knowledge?
10. Do you perceive IK as important?
11. Do you see IK becoming extinct?
12. Is it important to preserve IK?
13. Does the library have IK resources in its collection?
14. If yes, what is the nature of IK in the library's collection?
15. If yes, what is the form of IK in the library's collection?
16. If no, has the library taken any measures in the recognition of indigenous knowledge?
17. Which unit is in charge of IK collections in the library?
18. How would the management of IK be beneficial to the library?
19. How can IK be preserved in the library?
20. What are some of the challenges you foresee with management of IK in the library?
21. Is there anything you would like to clarify or add?

Section C: Policies and frameworks governing the management of IK

22. Does the library have a collection development policy?
23. When was the policy instituted?
24. Is the collection development policy operational?
25. What is the focus of the collection development policy?

26. Does the collection development policy cater for the management of indigenous knowledge?

27. Are you aware of any national policies that mandates the library to manage IK?

28. If no, would you recommend a national policy from government to mandate libraries to management IK?

29. Is there anything you would like to clarify or add?

Section D: Library Programmes and Services

30. What are the outreach programmes that the library undertakes?

31. Is any of the programme designed to create awareness on the importance of IK?

32. Is any of the programmes targeted towards serving the communities within which the library is located?

33. If yes, is the focus of the programme on documenting and managing the communities IK?

34. Does the library see it as a social responsibility to serve their community by management an aspect of their IK?

35. Does the library have documents that are accessible to indigenous communities?

36. How do you ensure that this information is made accessible to indigenous communities?

37. What are the ways to enhance the libraries services to indigenous communities?

38. What are the ways to enhance the programmes to indigenous communities?

39. Is there anything you would like to clarify or add?

Section E: Knowledge Organisation System used in the library

40. What is the knowledge organisation system used in the library to catalogue and classify your collections?

41. Does the classification system make room for subject headings on indigenous knowledge?

42. Do you see any challenge with getting appropriate subject headings for IK based on the classification system used?

43. Is there anything you would like to clarify or add?

Section F: Integration of IK into Library's Services

44. Is IK resources well represented in the library's collection?

45. Looking at the oral nature of IK, what strategies has the library put in place to enable access to IK

46. Do you consider IK as an intellectual asset?

47. If, yes do we need to manage it?

48. Do you think the library should consider the management of IK as one of their primary roles?

49. How best do you think the library can integrate IK in its collections?

50. Is there anything you would like to clarify or add?

Section G: Staff Training Programmes on IK

51. Are there any programmes designed to train staff on the management of IK?

52. If yes, what are the key elements and focus area on such trainings?

53. Is there anything you would like to clarify or add?

Section H: Tools and expertise needed for the management of IK

54. Does the library have the requisite expertise to document and manage IK?

55. Does the library have the requisite tools to document and manage IK?

56. Is the library equipped to render services to indigenous communities in terms of management their IK?

57. What are the competencies needed for the library to provide services to indigenous communities?

58. Is there anything you would like to clarify or add?

Section I: IK and Education

59. Is IK included in the university's curriculum?

60. Which department is in charge of IK curriculum?

61. Do you think the inclusion of IK into formal education will help in the management of IK and subsequently help the library to focus on IK collections?

62. Is there anything you would like to clarify or add?

Section J: IK and Sustainable Development

63. In your opinion, what is the role of IK to development?

64. Do you think there is a direct relationship between the management of IK and development?

65. Do you think the management of IK by information professionals will ensure its inclusion in development projects and decisions?

66. Is there anything you would like to clarify or add?

Thank you for your input and time.

APPENDIX 3: QUESTIONNAIRE FOR HEADS OF UNITS
Section A: Background Information on the Library

1. What is the strategic goal of this unit in the library?
2. What are the functions of this unit?
3. Who are the users of this unit in the library?
4. Is the unit opened to outsiders?
5. What is the staff capacity of the unit?
6. Is there anything you would like to clarify or add?

Section B: Awareness and Understanding of Indigenous Knowledge Systems

7. Are you aware of Indigenous Knowledge Systems?
8. If yes, in your opinion, what is indigenous knowledge?
9. Do you perceive IK as important?
10. Do you see IK becoming extinct?
11. Is it important to preserve IK?
12. Does the library have IK materials or resources in its collection?
13. If yes, what is the nature and form of IK in the library's collection?
14. If no, has the library taken any measures in the recognition of indigenous knowledge?
15. What role does the unit play in the collection and management of IK?
16. What are some of the challenges you foresee with management of IK in the library?
17. Is there anything you would like to clarify or add?

Section C: Policies and frameworks governing the management of IK

18. Are there any policies which governs the operation of your unit?
19. Does the policy cater for the management of indigenous knowledge?
20. Are you aware of any national policies that mandates the library to collect and manage IK?
21. Is there anything you would like to clarify or add?

Section D: Library Programmes and Services

22. What are the services that your unit provide to users?

23. Do you have any programme focused on the management of IK within your unit?

24. Do you have any programme focused on making information accessible to indigenous communities?

25. What are the ways to enhance the library's services to indigenous communities?

26. Is there anything you would like to clarify or add?

Section E: Knowledge Organisation System used in the library

27. What is the knowledge organisation system used in the library to catalogue and classify your collections?

28. Does the classification system make room for subject headings on indigenous knowledge?

29. Do you see any challenge with getting appropriate subject headings for IK based on the classification system used?

30. Is there anything you would like to clarify or add?

Section F: Integration of IK into Library's Services

31. Is IK resources well represented in the library's collection?

32. Looking at the oral nature of IK, what strategies has the library put in place to enable access to IK?

33. Do you consider IK as an intellectual asset?

34. If, yes do we need to manage it?

35. Do you think the library should consider the management of IK as one of their primary roles?

36. How best do you think the library can integrate IK in its collections?

37. What role will your unit play in the process of integration?

38. Is there anything you would like to clarify or add?

Section G: Staff Training Programmes on IK

39. Are there any programmes designed to train staff on the management of IK?

40. If yes, what are the key focus area on such trainings?

41. Is there anything you would like to clarify or add?

Section H: Tools and expertise needed for the management of IK

42. Does the library have the requisite expertise to document and manage IK?

43. Does the library have the requisite tools to document and manage IK?

44. Is the library equipped to render services to indigenous communities in terms of management their IK?

45. What are the skills and competencies needed for the library to provide services to indigenous communities (specific to the unit)?

46. Is there anything you would like to clarify or add?

Section J: IK and Sustainable Development

47. In your opinion, what is the role of IK to development?

48. Do you think there is a direct relationship between the management of IK and development?

49. Do you think the management of IK by information professionals will ensure its inclusion in development projects and decisions?

50. Is there anything you would like to clarify or add?

Thank you for your input and time.

APPENDIX 4: SURVEY QUESTIONNAIRE FOR LIBRARY STAFF

INVITATION TO PARTICIPATE IN A SURVEY

Dear Participant,

My name is Catherine Asamoah and I am conducting a research for my doctoral studies supervised by Professor Patrick Ngulube at the School of Interdisciplinary Research and Postgraduate Studies (SIRGS) in the College of Graduate Studies and the Department of Information Science, at the University of South Africa. I am inviting you to participate in a study entitled "**Developing a Framework for the Management of Indigenous Knowledge Systems (IKS) in Public University Libraries in Ghana**". The study seeks to investigate the status and challenges of developing IKS in public university libraries in Ghana to develop a framework for its effective management. The study population involves all librarians, heads of units of the various departments in the library, senior and junior staff to provide the researcher with the needed information. The study involves semi-structured interviews with University Librarians, questionnaires for heads of units, senior and junior staff of each unit. Your participation will help the library come up with strategies to integrate indigenous knowledge into their collection to serve their varied users and also inform policy frameworks from stakeholders.

Participants are assured of anonymity and confidentiality through non-solicitation of their personal details. Information collected will be strictly used for research purposes.

I humbly request you give your consent by signing this form for your participation in this research. Should you require any information about any aspect of the study, please contact me at casamoah@ug.edu.gh or kathrynasamoah@gmail.com or by telephone 0267868032. Alternatively, you may contact the researcher's supervisor through Ngulup@unisa.ac.za

Please sign this page to indicate your full participation in this study.

………………………   …………………..

Signature of Participant   Date

Thank you for taking your time to read this information sheet and for participating in this study.

Yours sincerely,

Catherine Asamoah

Dear Respondent,

You are kindly invited to participate in this study by answering the following questionnaire.

- Please answer questions by ticking **[√]** next to your preferred answer and explain where necessary.

- Where the writing space is not enough, please use a separate page and indicate the question number next to the answer.

- The questionnaire contains eight sections with **50** questions, which will take about **30** minutes to complete

Once again, I assure you of the anonymity and confidentiality of all your responses. Thank you very much for taking time out of your busy schedule to complete this questionnaire.

SECTION A: BACKGROUND INFORMATION

Please answer questions by ticking **[√]** where appropriate and use the space provided to answer questions that requires writing and further comments.

1. Which university is your library affiliated to?
   University of Ghana   [   ]

   Kwame Nkrumah University of Science and Technology   [   ]

   University of Cape Coast   [   ]

   University of Education, Winneba   [   ]

   University for Development Studies   [   ]

   University of Professional Studies   [   ]

   University of Mines and Technology   [   ]

University of Health and Allied Sciences   [   ]

University of Energy and Natural Resources   [   ]

Ghana Institute of Management and Professional Administration   [   ]

2. Gender
   Male   [   ]

   Female   [   ]

3. Age. Please indicate…………………………………………………………..

4. How many years have you worked at the Library?
   1 - 5 years   [   ]

   6 – 10 years   [   ]

   11 – 15 years   [   ]

   16 – 24 years   [   ]

   25 – 30 years   [   ]

   31 years and above   [   ]

5. What is your department/unit in the library?
   Acquisition   [   ]

   Cataloguing   [   ]

   Reference services   [   ]

   Africana/Special Collections   [   ]

   Electronic Resources Services   [   ]

   Others? Please specify……………………………………………………

6. What is your level of Education?

   Senior High School   [   ]

   O level or A level   [   ]

   Diploma   [   ]

   Undergraduate Degree   [   ]

   Master's degree   [   ]

   Doctorate Degree   [   ]

7. Please indicate your current rank or position……………………………………….

SECTION B: AWARENESS AND UNDERSTANDING OF INDIGENOUS KNOWLEDGE (IK)

8. Are you aware of indigenous knowledge (IK)? If no, please move to the next question.

   Yes   [   ]

   No   [   ]

9. How did you become aware of IK? (***Please select as many as are applicable***)

   Oral Traditions   [   ]
   Community   [   ]
   Education   [   ]
   History   [   ]
   Library's Collections   [   ]
   Library awareness creation   [   ]
   Publications   [   ]
   Workshop/Seminar/Conference   [   ]
   Others, please specify………………………………………………………………….

   10. On a scale of 1-5, where 1= Strongly Disagree, 2= Disagree, 3= Neither agree or disagree, 4= Agree, 5= Strongly Agree. Please indicate appropriate responses that reflects your level of agreement or disagreement on the statements provided in relation to what is indigenous knowledge (***Please select as many as are applicable***)

What is Indigenous Knowledge	1	2	3	4	5
Knowledge unique to a particular culture/society and form the basis of local decision making on every aspect of people in the community and their way of life					
Knowledge a community possesses and develop over time and continue to develop					
Knowledge embedded in community practices, institutions, relationships and rituals					
Knowledge based on experiences tested over centuries of use					
Knowledge adapted to local culture and environment					
Knowledge based on information, practices, beliefs, experimentation, technologies, informal education and communication					
Knowledge based on oral traditions, culture and indigenous skills					
Knowledge expressed in local languages					
Knowledge possessed by any community, rural/urban, original inhabitants/migrants, settled/nomad					
Knowledge transmitted orally from generation to generation and not systematically documented					
Knowledge that tacit and difficult to codify					

11. What are the types of IK known to you? (*Please select as many as are applicable*)

    Health care   [   ]

    Education   [   ]

    Natural Resource Conservation/Management   [   ]

    Agriculture   [   ]

    Conflict Resolution/Management   [   ]

Oral Traditions   [   ]

Culture (Traditions, festivals, ceremonies etc.)   [   ]

Music and Dance   [   ]

Religion   [   ]

Artefacts   [   ]

Others, please specify…………………………………………………………………….

12. What is the nature of IK collections in the library? (*Please select as many as are applicable*)
Written form (Documents)   [   ]

Oral form (Recording Tapes)   [   ]

Slides/Audios/Films/Videos/CD   [   ]

Maps/Flow Charts   [   ]

Pictures   [   ]

Calendars   [   ]

Others, please specify…………………………………………………………………….

13. What are the IK materials in the library's collection?

IK Materials	Please select (as many as are applicable)
Books	
Diaries/Letters/Journals	
Genealogies	
Family Albums	
Photographs	
Music	

Videos	
Microform	
Audios/Cassette/CD-ROM	
History	
Maps	
Almanacs	
Newspaper	
Magazines	
Artefacts	
Others, please specify	

14. What is the frequency of use of these materials? Please indicate appropriate responses that reflect the frequency of use of IK materials in the library. (***Please select as many as are applicable).***

IK Materials	Never	Rarely	Occasionally	Sometimes	Frequently
Books					
Diaries/Letters/Journals					
Genealogies					
Family Albums					
Photographs					
Music					
Videos					

Microform					
Audios/Cassette/CD-ROM					
History					
Maps					
Almanacs					
Newspaper					
Magazines					
Artefacts					
Others, please specify					

15. What is the level the IK resources/materials in the collections? *Please select as applicable.*

Level of Collections	Please select (as many as are applicable)
Research	
Instructional Materials	
General/Basic Information	
Others, please specify	

16. Has the library made any effort to document IK?
    Yes   [   ]

    No   [   ]

17. If *yes*, what is the rationale for the documentation of IK?

…………………………………………………………………………………………………

…………………………………………………………………………………………………

……………………………………………………………………………………………

18. Which unit/department/section is in charge of the documentation process?

…………………………………………………………………………………………………

……………………………………………………………………………………………….

19. In what ways has Indigenous Knowledge benefitted you?

…………………………………………………………………………………………………

…………………………………………………………………………………………………

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SECTION C: POLICIES AND FRAMEWORKS GOVERNING THE MANAGEMENT OF INDIGENOUS KNOWLEDGE

20. Does the library have a Collection Development Policy?

Yes   [   ]

No   [   ]

21. If your answer is '*yes*', does your collection development policy cater for the management of Indigenous Knowledge?

Yes   [   ]

No   [   ]

22. Do you think Indigenous Knowledge has potential commercial value?

Yes   [   ]
No   [   ]

23. If your answer to **Q20** is **yes**, should there be intellectual property laws to protect IK?

Yes   [   ]

No   [   ]

24. If your answer to **Q20** is **no**, please state your reasons?

………………………………………………………………………………………………

………………………………………………………………………………………………

………………………………………………………………………………………………

25. What intellectual protection laws should be applied to protect IK materials in the library?

Please select as many as are applicable.

Patent   [   ]
Trademarks   [   ]
Trade Secrets   [   ]
Copyright   [   ]
Others? Please specify……………………………………………………………………….

26. Do you think applying intellectual property laws will limit the use of IK globally?

Yes   [   ]
No   [   ]

27. Please explain your reason for the option chosen in **Q24**

…………………………………………………………………………………………………

…………………………………………………………………………………………………

…………………………………………………………………………………………………

………………………………………………………………………………………

28. Do you think the management of IK can only be effective if supported by government policy?
Yes   [   ]
No   [   ]

29. On a scale 1-5, where 1= Strongly Disagree, 2= Disagree, 3= Neither agree or disagree, 4= Agree, 5= Strongly agree. please indicate appropriate responses that reflects your level of agreement or disagreement on the statements provided in relation to the effective management, preservation and protection of IK (***Please select as many as are applicable)***

Statements	1	2	3	4	5
The management of IK will be effective if it is supported and backed by legislation from government					
Communities should manage their own IK in order to protect it					
Libraries should be proactive to partner with communities to manage and preserve IK					
Libraries are mandated to partner with communities to manage and preserve IK					
The management and preservation of IK and its protection from overexploitation calls for participation from all stakeholders					

SECTION D: LIBRARY PROGRAMMES AND SERVICES

30. How can the library document and manage IK effectively?

Programmes	Please select (as many as are applicable)
Collaborating with indigenous communities to document their IK	
Collaborating with experts in the documentation of IK	
Assist communities to protect their intellectual asset (IK)	
Make available and promote information resources on indigenous knowledge	
Publicize the value of IK to patrons	
Encourage the recognition of intellectual property rights on the use of IK	
Others? Please specify	

31. What are the strategies the library can devise to make IK accessible to all?

Strategies	Please select (as many as are applicable)
Preparing inventories and registers of indigenous knowledge systems	
Developing collection development polices	
Developing standardized tools for indexing and abstracting	
Publicity of IK resources and its importance	
Compiling bibliographies of IK resources	
Others? Please specify	

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32. What is the role of information professionals in managing IK?

Role of Information Professionals	Please select (as many as are applicable)
Developing collection development policies	
Collection of IK	
Recording and Documentation	
Organizing IK resources	
Preservation and Storage (different media) of IK	
Networking with stakeholders	
Disseminating IK resources	
Access Management	
Publicizing and promoting the importance of IK resources	
Protection of Intellectual Property Rights	
Others? Please specify	

33. In what form can IK be documented? (*Please select as many as are applicable)*

Taxonomies   [   ]

Inventories   [   ]
Transcription (in the form of documents)   [   ]
Drawings   [   ]
Music and Drama   [   ]
Stories   [   ]
Maps   [   ]
Photos   [   ]
Films and videos   [   ]
Audios   [   ]
Almanacs   [   ]

SECTION E: INTEGRATION OF IK INTO LIBRARY'S SERVICES

34. Do you consider IK as an intellectual asset?
  Yes   [   ]
  No   [   ]

35. Please give your reasons to your response to Q34.

……………………………………………………………………………………………………
……………………………………………………………………………………………………
……………………………………………………………………………………………………
……………………………………………………………………………………………………
……………………………………………………………

36. Is IK resources/materials well represented in your library's collections?
  Yes   [   ]
  No   [   ]

37. Can you explain why?

……………………………………………………………………………………………………
……………………………………………………………………………………………………
……………………………………………………………………………………………………
……………………………………………………………

38. How do you provide access to IK materials in the library?

Provision of Access	Please select (as many as are applicable)
We catalogue and shelve IK materials	
We provide online access through databases	
We prepare finding aids for IK materials	
We network to share IK resources with other institutions (consortia)	
We use bibliographies	
We use index and abstracts	
Others, please specify	

SECTION F: STAFF TRAINING PROGRAMMES ON IK

39. Have you had any training on the management or preservation of IK?
    Yes   [ ]
    No   [ ]

40. If *yes*, what was the content of the training?

………

………

………

………

………………………………………………………

41. Has the training equipped you to be able to document or manage IK?
    Yes   [ ]

    No   [ ]

42. If *no*, would you want to be trained on how to document or manage IK and why?

………

………

………

………

……………………………………………………………

43. Have you been trained on the preservation of information resources in different format?
    Yes   [ ]
    No   [ ]

44. What were the aspects of preservation that you were trained on?

………

………

………

………

SECTION G: TOOLS AND EXPERTISE NEEDED FOR THE MANAGEMENT OF IK

45. Please indicate your level skills in the following by choosing on a scale of 1-5, where 1=Poor, 2=Fair, 3=Good, 4=Very Good, 5=Excellent how competent you are in the following areas.

Level of Competency	1	2	3	4	5
Computer Literacy					
Digital Literacy					
Media Literacy					
Cultural Awareness					
Oral Traditions					
Documentation					
Transcribing					
Codification					
Translation					
Video/Photo Editing					
Managing Databases					
Digitisation					
Preservation Management					
Indexing and Abstracting					
Cataloguing and Classification					

SECTION H: IK AND SUSTAINABLE DEVELOPMENT

46. On a scale of 1-5 where 1= Not at all Important, 2= Slightly Important, 3=Neutral, 4=Very Important, 5= Extremely Important, please indicate the role of IK to development. *Please select (as many as are applicable).*

Role of IK to Development	1	2	3	4	5
Education					
Agriculture					
Medicine					
Conflict Resolution and Management					
Cultural Identification					
Environmental Conservation					
Security					
Skills Acquisition					
Entrepreneurship					
Others, please specify					

47. Do you think incorporating IK into development projects will ensure sustainability?
    Yes   [   ]

    No   [   ]

48. If *yes* or *no*, please explain your reason?
……
……
……

……

……………………………………………………………………………………….

49. Which of the following do you see as a challenge to the management of IK by information professionals?

Challenges	Please select as many as applicable.
IK not part of University curriculum	
Recognition of the kind of IK to collect	
Lack of validation of IK	
Lack of expertise to collect oral traditions	
Language barrier in collecting IK	
Lack of tools and/or equipment for documentation	
Lack of documentation strategy	
Funding constraints	
Lack of interest by information professionals to collect IK	
Lack of resources	
Lack of technical staff	
Inadequate ICT infrastructure	
Lack of staff training	
Intellectual Property Rights	
Lack of collaboration among various stakeholders	
No policy mandates libraries to collect and manage IK	
Others? Please specify	

50. Please use the space provided to make any additional comment on the management of IK by information professionals

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Thank you very much. Your time and effort in filling out the questionnaire is very much appreciated.

Appendix 5: Observation Checklist
OBSERVATION CHECKLIST

The following list are the benchmarks used to ascertain the presence of IK collections in the University Libraries.

Benchmark	Status and Comment
1. Unit for the Management of IK	
2. IK materials included in library's collection	
3. Nature of IK materials in library's collection	
4. Library has a Collection Development Policy (CPD)	
5. CPD captures the collection of IK	
6. CPD captures the management of IK	
7. Library opened to outsiders	
8. Category of users that use or request IK resources	
9. IK integrated into library programmes	
10. Bibliography of IK materials	
11. IK Database	
12. Documentation Unit	
13. Digitisation Unit	
14. ICT Infrastructure	

Appendix 6: Ethical Clearance

DEPARTMENT OF INFORMATION SCIENCE RESEARCH ETHICS REVIEW COMMITTEE

Date: 18 May 2017

Ref #: 2017_CA_58541810_001
Name of applicant: C Asamoah
Student #:X
Staff #:

Dear C Asamoah,

Decision: Ethics Approval

Name: Title and name of principle applicant, address, e-mail address, and phone number
Ms Catherine Asamoah, Unisa Information Science, 58541810@mylife.unisa.ac.za and +233267868032

Proposal: Integration of indigenous knowledge management in the collection development of public universities libraries in Ghana.

Qualification: Ph D in Information Science

Thank you for the application for research ethics clearance by the Department of Information Science Research Ethics Review Committee for the above mentioned research. Final approval is granted for *4 years.*

For full approval: *The application was reviewed in compliance with the Unisa Policy on Research Ethics by the Department of Information Science Research Ethics Review Committee on 18 May 2017.*

The proposed research may now commence with the proviso that:
1) *The researcher/s will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.*
2) *Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should be communicated in writing to the Department of information Science Ethics Review Committee. An amended application could be requested if there are substantial changes from the existing proposal, especially if those changes affect any of the study-related risks for the research participants.*

University of Ghana
Institute of African Studies
Legon

4th March 2019.

The University Librarian
University of Development Studies
Tamale

Dear Sir/Madam,

PERMISSION TO COLLECT RESEARCH DATA

My name is Catherine Asamoah and I am conducting a research for my doctoral studies supervised by Professor Patrick Ngulube at the School of Interdisciplinary Research and Postgraduate Studies (SIRGS) in the College of Graduate Studies and the Department of Information Science, at the University of South Africa. I am inviting you to participate in a study entitled "**Developing a Framework for the Management of Indigenous Knowledge Systems (IKS) in Public University Libraries in Ghana**". The study seeks to investigate the status and challenges of developing IKS in public university libraries in Ghana to develop a framework for its effective management. The study population involves librarians, heads of units of the various departments in the library, senior and junior staff to provide the researcher with the needed information. The study involves semi-structured interviews with University Librarians, questionnaires for heads of units, senior and junior staff of each unit. Your participation will help the library come up with strategies to integrate indigenous knowledge into their collection to serve their varied users and also inform policy frameworks from stakeholders.

Participants are assured of anonymity and confidentiality through non-solicitation of their personal details. Information collected will be strictly used for research purposes.

Should you require any information about any aspect of the study, please contact me at casamoah@ug.edu.gh or kathrynasamoah@gmail.com or by telephone 0267868032. You can also contact the researcher's supervisor through Ngulup@unisa.ac.za

Counting on your cooperation.

Yours sincerely,

Catherine Asamoah

College of Human Science   *Faculty of Arts*   *Department of Information Science*

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