

EMERGENCE OF KNOWLEDGE COMMONS IN THABO MOFUTSANYANA DISTRICT
MUNICIPALITY LIBRARIES, FREE STATE, SOUTH AFRICA

by

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I declare that the above thesis is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

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ABSTRACT

The purpose of this study was to examine the emergence of knowledge commons Thabo Mofutsanyana District public libraries in South Africa in order to understand how ICT and communitarian ethos are facilitating the implantation of delivery of digital services to the library users' community. The study employed mixed-methods and triangulated sample survey to collect data. Out of the Thabo Mofutsanyana District population, 180 library users, 16 community leaders and 17 library officials were sampled. The researcher used a probability and non-probability sampling technique to select the respondents. Data was collected using a questionnaire and in-depth interview guides respectively. The quantitative data was analysed using descriptive statistics and nonlinear factor analyses approaches, while thematic coding was used to analysed qualitative data. The major findings of the study indicate that the respondents were satisfied about the transformation in their libraries and the emergence of knowledge commons which consists of rule changes, community involvement, and improved biophysical condition such as technology infrastructure, online resources and physical spacing among others. However, the results also indicated challenges which were brought by the emergence of knowledge commons. The study concludes that the rapid transformation in these public libraries compelled them to change the manner in which they used to function. It was recommended that in order to maintain success, community involvement, rules, incentives, equality, and other factors should be considered to promote sustainability. This study proposes that since some of the public libraries have Makerspaces in their spaces, researching the significance of the Makerspaces in the public libraries of South Africa is proposed.

Keywords: Knowledge commons; Public libraries; Information and communication technologies; Digital skills; Digital literacy; Thabo Mofutsanyana District; Free State; South Africa.

DEDICATION

This thesis is dedicated to my God who gave me my late parents Mr Ezekiel and Mrs Matshediso Seotlela. This study is also dedicated to my loving husband Mr Lucas Matobako, my lovely children who made this work successful. I am also dedicating this work to my beautiful grandchildren and also my siblings Mr Letseka and Richard Seotlela and their families.

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LIST OF ABBREVIATIONS AND ACRONYMS

WWW:	World Wide Web
UN:	United Nations
IFLA:	International Federations of Library Associations
DVD:	Digital Versatile Disc
IT:	Information Technology
ICT:	Information and Community Technologies
UN-MDGs:	United Nations Millennium Development Goals
WSIS:	World Summit on the Information Society
IGF:	Internet Governance Forum
NLSA:	National Library of South Africa
LIASA:	Libraries and Information Association of South Africa
DAC:	Department of Arts and Culture
IAD:	Institutional Analysis and Development
UNISA:	University of South Africa
CCNY:	Carnegie Corporation of New York
RDA:	Resource Description Access
NCLIS:	National Council of Library and Information Services
LIS:	Library and Information Services
UNESCO:	United Nations Educational, Scientific and Cultural Organization
ANC:	African National Congress
CPR:	Common-Pool Resources
OA:	Open Access
IPR:	Intellectual Property Rights
BCE:	Before the Common Era
EIFL:	Electronic Information for Libraries
CODESRIA:	Council for the Development of Social Research in Africa.
ALA:	African Leadership Academy
MMA:	Mphethi Morojele Architects
UCT:	University of Cape Town

FOSS:	Free and Open-Source Software
OPAC:	Online Public Access Catalogue
PCA:	Principal Component Analysis
BTS:	Bartlett's Test of Sphericity
KMO:	Kaiser Meyer Olkin
CFA:	Confirmatory Factor Analysis
SPSS:	Statistical Package for the Social Sciences
AMOS:	Analysis of a Moment Structures
SEM:	Standard Error of the Mean
RMSEA:	Root Mean Square Error of Approximation
CFI:	Comparative Fit Index
SRMR:	Standard Root Mean Square Residual
K-R:	Kuder-Richardson
SABINET:	Southern African Bibliographic Information Network
CV:	Curriculum Vitae
PC:	Personal Computer
CPW:	Community Work Programme
UPS:	Uninterruptible Power Supply
AVE:	Average Variance Extract
MSV:	Maximum Shared Variance
ASV:	Average Shared Variance
SMC:	Square Multiple Correlation
DSPACE:	Digital Signal Processing and Control Engineering

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CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE STUDY

If you have an apple and I have an apple and we exchange apples, then you and I will still each have one apple. But if you have an idea and I have an idea and we exchange these ideas, then each of us will have two ideas (George Bernard Shaw, cited in Nwagwu 2012:6).

1.1 Introduction

The past four decades have seen the emergence of a new form of library services known as knowledge commons often interchanged with digital commons, information commons, internet commons, and electronic commons, with minor technical differences (Beagle 2006; Kranich 2007; Lippincott 2006; Madison, Strandburg & Frischman 2016; Kaul, Grunberg & Stern 1999). Kranich and Schement (2008) define knowledge commons as information which is shared by a community of consumers and/or producers Hess and Ostrom's (2004) opinion is more encompassing. To them, "... knowledge commons can be described as a practice of creating and sharing of information, data, knowledge, science, and other types of intellectual and cultural resource collectively owned and managed, particularly over the World Wide Web" (Hess & Ostrom 2004:18).

Knowledge commons capture the variability and complexity of knowledge and also information as natural resources, consisting of multiple types of information goods, services and regimes. Knowledge commons is a vestige of the global commons. Generally, the global commons is concerned with those cultural and natural resources including natural materials such as water, air, and a habitable earth that are freely accessible to all members of a society. Kaul, Grunberg and Stern (1999) and Wemheuer-Vogelaar (2013) have averred that the commons family include knowledge as a member.

There are many reasons for which knowledge is considered a commons resource. Knowledge is traditionally a type of public good that is "non-rivalrous and non-excludable" (Ndofirepi & Cross 2017:23; Wemheuer-Vogelaar 2013). That is, the consumption of a good by one does not stop another from consuming the same good, and does not deplete the resource. Everyone can consume it, and yet it is not depleted. Consumers of the goods do not also become rivals. A radio broadcast

is a typical example. If someone has the right equipment and is in the right area, access to radio transmission is non-excludable. Kahin and Foray (2006) state that human knowledge is an artefact that can be easily shared, traded and exchanged, created and communicated, leveraged and transformed. Also, human knowledge is limitless, elastic and dynamic (Hess & Ostrom 2007). It reflects the diversity and variety of human communities, existence and civilization. Finally, human knowledge can accumulate indefinitely, a major attribute of a public good. Typical examples are the internet and the library (Kranich & Schement 2008).

Even as a public good, human knowledge can be ‘packaged’ and made available outside the public space; it then acquires forms that contradict the expectations of a public good, and can for instance, be sold (Vaidhyathan 2001). This is my way of recognising that there are critiques about the position that knowledge is a public good. When knowledge is available in text, and further into a book form, for instance, it becomes excludable and rivalrous. Such goods can be copyrighted thus restricting, or prescribing, access and use. Copyright laws exist and they attempt to privatize what is generally intrinsically known as public good because of this attribute. However, technically copyright laws recognize that knowledge is a public good, and that it is only the expression of the ideas, mainly in the form of texts, that are privatized, and that the ideas themselves cannot be privatized or regulated, and are therefore always a public good. In this regard, texts in certain media whether skin, paper or clay may not be considered public good, even when they are meant to be so by author consent and or enabling regulatory provisions (Hess & Ostrom 2004). This argument will be expatiated somewhat in more depth in Chapter Two that focuses on Literature Review.

1.1.1 Impetus for Knowledge Commons

A major impetus for knowledge commons is that there is a new medium for expressing information that beats the constraints of managing texts (Goody 1987; Ong 1982). Digital texts are generally non-rivalrous. Given the right infrastructure, copies of a digital text can be distributed without users taking their turns, or other uses being blocked because the resource is under use, or the cost use multiplied, or the resources depleted. In ways that meet human imagination, this development could be considered the deepest transformation which the digital revolution has brought to the

modern world. Human knowledge can be recorded and shared without first changing into an object that is rivalrous. This revolution liberates information in all forms whether sound, videos, or images. The WWW has rendered knowledge recordable as a non-rivalrous resource just as the original knowledge itself is; and this is evidently, something new in the world. This is the key impetus of knowledge commons.

Knowledge commons is easily realised when human knowledge is cast in a non-rivalrous format and made accessible to users through the internet. Knowledge commons therefore offers us a way of deploying the “new shared territory of global distributed information” (Hess & Ostrom 2007:22) – the internet and facilitates the building of fundamentally strong institutions and human capital for the 21st century democracy. Information and communication technologies make information resources available to all in a space that permits self-service and freedom of interaction, in addition, in many cases, to access to information created offline. The internet, for instance, is a globally shared knowledge database that feeds humanity with knowledge that could fast-track learning, innovation and research. Knowledge commons is a confluence of information and allied information resources, services and spaces (Hess & Ostrom 2007).

With increasing low cost of information technology devices, accessing knowledge has become very easy, and a variety of touch-screen technologies, augmented reality, and smart systems and devices have enriched the library with information layers and contents at the disposal of the users. Hess and Ostrom (2007) suggested that the ultimate essence is to create an environment that seamlessly encourages, facilitate and enhances creation and recreation of knowledge, information and ideas. It provides a new way to stimulate innovation, foster creativity, and build a movement that supports information becoming a shared resource. It is not only a way of responding to the challenges posed by the issue of knowledge enclosure that was orchestrated by print publishing and traditional academic publishers that pay-wall human knowledge and constrict access, but it is a veritable way of building fundamental democratic institutions (Hess & Ostrom 2007). Bollier (2002) has averred that knowledge commons is a response to unbridled commercialism and privatization of public assets that came to their critical peak in the 1980s and 1990s.

Knowledge commons combine the information technology, the library, librarians and the community that the library serves in a seamless co-dependence manner that influences both library content and services. It is a way of agglomerating human knowledge, information, internet/WWW, and all other human resources associated with the learning, searching and spreading of ideas and wisdom through interaction, self-consultation and self-cogitation and investigations in an environment that promotes, supports and enhances birth and rebirth of knowledge and ideas. Evidently, new information technologies have redefined knowledge communities, altered the traditional world of information users and information providers, made archaic many of the existing norms, rules, and laws and have also led to astonishing outcomes (Beagle 2002; Heins & Beckles 2005; von Hippel 2005).

Just like in other commons, the major characteristic that distinguishes knowledge commons, is the sharing of resources among members of a community (Madison, Frischmann & Strandburg 2010). Ostrom (2005) posited that rather than a community of people, information resources, community or place, researchers view knowledge commons from the perspective of how the library as an institution, arranges these elements and coordinates them through a combination of formal rules, social norms, customs, and informal disciplines, and technological and other material considerations.

Ostrom's (2011) social and ecological context' approach to understanding and analysing institutions has received great support in the literature as a way of studying the new library. Ostrom's approach places the action situation at the centrepiece of knowledge commons; action situation refers to the actual, virtual social forum or other, where individuals who use the commons meet and engage with one another. Ostrom also described 'actors' as consisting of citizens, sellers, buyers, senators, litigants and judges in the community whose roles influence the activities of the institution. The actors possess information, cognitive capacities, strategies, preferences (conditional co-operator, rent-seeker, free rider, etc.). These actors establish interaction patterns that produce outcomes as well as generate ecological effects on the wider society. Ostrom (2007) has also described the biophysical or material conditions of the institution as very vital in studying institutions; the "attributes of the community" Ostrom (2007:112) in which the actors live or

operate, and the rules and the norms that guide the operations of the institution are also crucial elements of the new library.

1.1.2 The Library as a support for the knowledge community

The library has been a support system for the knowledge community and a store for human knowledge and wisdom. Libraries that incorporate the implementation of information technologies in such a manner that conform to the commons expectation are referred to as implanting knowledge commons. The commons is being achieved in the libraries through the deployment of information and communication technologies to make information resources online and openly available to all in a space that permits self-service and freedom of interaction, in addition to the access created offline. It is a collaboration of resources, services and spaces. Libraries are dedicated to offer a conducive physical environment for interaction, equitable and free availability and access to information and knowledge whether in a written, audio-visual or electronic format all over the world.

In addition, the United Nations (UN) report articulated that efforts are needed to bring the poor people from different parts of the world, particularly the developing countries into the global conversation (IFLA 2001). Darren Hoerner, a programme director at Bill & Melinda Gates Foundation has observed “libraries are reaching outside the box” (Mitchell 2013: par. 2) in Africa, and that there exist evidence of sharing of experiences and case studies about how libraries are trying to meet the needs of their communities in Africa. It is evident that through Bill & Melinda Gates Foundation, Global Libraries strategic investment and support was shaping and developing some African libraries to reach out and adapt to the needs of their users. For example, in Botswana, some public libraries in rural areas are institutionalizing community practices of helping small business owners to make their businesses more profitable and competitive (Bill & Melinda Gates Foundation 1999-2018). The report from Global Libraries Projects further indicates that these libraries support and promote openness in their operations, and according to Hess and Ostrom (2005) and Kaul et al (1999), they should be categorized as common human heritage because their resources are shared by a group of people in the community or by communities. The libraries are bringing the communities into the global conversation by emerging into knowledge commons

which provides information technology, community practise of interacting, sharing, creation of knowledge and information and cultural heritage and resources that are collectively owned and managed by users over the internet.

The evolution of library services has been influenced by the rapid development in information technologies; libraries used to merely preserve books; then they started preserving information on DVDs, floppy disks and zip files. This emergence coincides with the expectation in this modern knowledge economy which permits creation of new value in highly collaborative environments by using immediately digestible information. Meaning that space within the library can be used for meaningful interactions and other forms of communication. In very advanced libraries, there is increasing use of advanced machines such as robots, to collect books and other materials from their locations to users of administrators in addition to serving dispersed populations who need access to certain information and information services that might either be available only in the libraries (Alexander 1997; Federici 2004; Hill 1972; Hyde 2010).

Evidently, institutional change is occurring in the libraries at a very rapid scale. In *The Changing Culture of Libraries*, Feinberg (2001) has observed how the library, its mission, content and management are changing rapidly. Both in building and activities, libraries are becoming more of 'hubs', featuring public services in campuses such as "information technology (IT) helpdesks, software resources and multimedia resources and traditional books and training" Feinberg (2001:24). The shift is motivated by the balance from managing printed materials as the primary function of the library to managing digital resources. In alignment with this move, the space design needs have moved from providing spaces for silent individuals who are reading/studying printed resources, to places that provide support for a wide range of activities that are now offered in the library (Solk 2016, par.5).

The information users' opportunities, choices and preferences are also changing rapidly. There is increasing focus on, and interest, in library spaces, as well as how to enable the communities participate in the creation of the content and service delivery of the libraries (IFLA 2011). Personal and interpersonal factors including stimulation, identity and security, which influence the comfort of people using public library spaces, are becoming more important today than ever. From

individual workstations settings, the libraries have become social work settings, encompassing integrated support rather than single - support delivery, and allowing whiteboards for talking rather a place where rules against talking abound. Knowledge commons has also highlighted the need for spaces - learning spaces, digital space, team space, social space and personal space (Feinberg 2001; Peacock & Wurm 2013).

In *The New Academic Librarian* that followed more than ten years after, Peacock and Wurm (2013) described the changing nature in the roles and training of the librarians since the emergence of information technology. The library workforce is moving away from the regular library jobs regimes to embrace job types and attitudes that require critical thinking, improved communication skills, problem solving, and teamwork. It has been suggested that these new levels of improvement are required to process and manage a variety of digital media as a way of enhancing quality service delivery (IFLA 2011).

There has been a wide array of opportunities for the librarians in an information-based society; information is available through electronic and multimedia strategies of publishing, networking across local, national and global environment; there is existence of navigational and filtering tools that could enable one have access to resources through networked and even non-electronic sources. There also new modes for information delivery and educational services and programs (Griffiths 1995; Ratledge & Sproles 2017). There is also growth in recorded information in terms of rate and formats: numeric, texts, graphic, video, image, audio, and other electronic and artefacts. There is increase in the array of computing as well as information and telecommunications technologies that play significant roles in creating new alternatives, and boosting chances for creation of information, collection, storage, accessing and systems and service delivery. How have human societies evolved and endured through the ages, and how does the modern society transform the diver cultural and linguistic heritages into advantages? (Asselin & Doiron 2013). More specific to this study, how is the emerging new library democratised access to human knowledge in South Africa? In very advanced libraries, there is increasingly use of advanced machines such as robots, to collect books and other materials from their locations to users of administrators in addition to serving dispersed populations who need access to certain information and information services that might either be available only in the libraries.

Knowledge commons encompass a wide range of issues namely infrastructure issues, functional and service concerns that touch on collections, research and instruction, bibliographic access, and technical processing. It also includes electronic communication, partnerships human resource preparedness and readiness. Knowledge commons address a wide scope of services such as online resources, crowdsourcing, social media and mobile services. Knowledge commons facilitates easy linkage to various classes of online databases, and access to offline resources in the library, visualising data - deciding on the best data format, data type, audience profiling, and medium. Many knowledge commons project include data management, which helps make the research process more efficient.

Furthermore, knowledge commons provides researchers with options on how to deploy digital technologies to meet research needs such as accessing digital content, finding funding, writing grant proposals, finding collaborators, project management, content and data management, determining the best methods and platforms/tools for a project, and exploring options for hosting, data sharing, and curation. Research impact assistance to researchers enables them describe, understand and monitor the impact of their research: metrics such as journal impact factor, h-index and CiteScore; deploying databases to compile citations for grant or promotion and tenure applications, managing visibility of research, managing digital identity, selection of publication venues. Knowledge commons also provide videos and tutorials of lectures and training sessions. They also create opportunities for people to collaborate with peers across the universe in a formal/semi –formal setting as well as online help on various issues of interest.

The level of online resources and strategies in Free State, in terms of embracing the knowledge commons has been adequately influenced by the rapid developments in information technology. Despite the relative high degree of technology applications in the libraries in the Free State libraries, the adoption of technologies has been seen to be generally slow (Matobako & Nwagwu 2018). The significance of this research for the efficiency of library services and the implications for roles and involvement of stakeholders of the library need to be carefully studied. The human resources requirement, technologies, change management, the influence on scholarship and practice, among others require to be studied and understood, and appropriate measures implemented to ensure that there is an alignment between library skills and library users' needs.

Inferences from the literature show that in many communities, knowledge commons is deliberately implemented. In this case, the libraries undertake a systems analysis of the situation, identify needs and resources that are required to transform the libraries to commons status, and then implement a knowledge commons. In other communities, knowledge commons is an accidental event. The libraries in Free State, particularly those that participated in the Mzansi Libraries On-line Country Grant, fell into the second category. Far from suggesting binary characteristics in the emergence of knowledge commons, there exists an observed liberal-progressive tradition that anticipate and perceive only positive social changes from technological development otherwise known as technophilia (Kincsei 2007), and it contributes in our understanding of the emergence. Usually, libraries acquire Information and Communication Technologies (ICTs) for sundry activities and train their staff on how to use the technologies. Many library clients have ICT skills and capacity; they visit the libraries with their information technology resources and sometimes are aided by library service providers who have training on ICT to assess the Web and use other electronic resources in the library.

1.1.3 Public Libraries in South Africa and the Commons

Since the demise of apartheid, and the birth of democracy in South Africa in 1994, public and other libraries have been undergoing rapid transformations to meet their mandate of building and sustaining literate, knowledgeable and informed communities (Asselin & Doiron 2013). There is a strong and a growing consciousness in maintaining the multicultural status of the country, and at the same time cultivating a strong and united people, will require adequately informed people that have access to knowledge about how human societies have evolved and survived through the ages and how modern societies convert cultural and linguistic diversities into advantages (Asselin & Doiron 2013). The rapid absorption of digital technologies in library and information services has been one of the key drivers of this transformation (Asselin & Doiron 2013). On a larger scale, obtaining, publishing, processing and disseminating research information has become easily achievable due to the power of ICTs and other ICT-enabled services. The impetus to address democratization of information and knowledge has received strong support while efforts to bridging knowledge and digital divides have been facilitated by several national policies that support the significance of information exchange and knowledge acquisition.

The observed ongoing transformation in the library in South Africa is not a unique one; there is evidence of similar events in the whole world. In the 21st century for instance, leadership globally have arrived at a consensus about the need to harness global initiatives in order to facilitate social empowerment, and fast track economic progress, and promote inclusive development. Many global intergovernmental initiatives have been introduced at the beginning of the 21st century including the United Nations Millennium Development Goals (UN-MDGs), Internet Governance Forum (IGF) and World Summit on the Information Society (WSIS). These initiatives have implications for addressing challenges of knowledge and digital divides.

These global changes have also affected the way in which public libraries operate and deliver their services as well as how they communicate and facilitate access to information as well as how they characterise and represent knowledge domain. There is increasing focus and interest on library design, language and architecture as well as how the communities perceive and influence what the services of the library should be. IFLA (2011) have revealed that there seems to be a general consensus that for libraries and their services to remain relevant in the digital era, it will then be necessary to re-evaluate and rethink how they look physically. The library workforce is exiting from regular jobs format to an occupation that requires critical re-thinking, problem-solving, communication skills, teamwork, and should possess the ability to process and manage a variety of digital resources and media in order to expand their variety and quality of service delivery (IFLA 2011). A major tool of the changes in the public libraries in South Africa has been the implementation of information technology applications. The rapid absorption of digital technologies in library and information services signifies one of the facilitators of this transformation (Asselin & Doiron 2013). These technologies are increasingly transforming the libraries into better learning spaces where there is engagement, knowledge sharing and information dissemination.

The public libraries have been compelled to absorb user and user demands in such a manner that ensures that library users can work together and share information, and knowledge in ways previously unavailable (Lihn 2008:630). These transitions conform to the global consciousness, in which knowledge has long become a commodity that can be easily shared, traded and exchanged, created and communicated, leveraged and transformed (Kahin & Foray 2006). Knowledge

commons offer a way not only to respond to the challenges posed by the new shared territory of globally distributed information, but also of contributing in building of an institution that is represent for the nascent democracy.

Traditionally, library users used the public library to check books, read and do research. However, technological advancements since the 1990s and the exploration of knowledge as commons have changed the expectations of library users learning paradigm. Due to the low cost of creating and distributing information electronically, knowledge commons makes cultural and scientific heritage more freely available and open for more and better contribution in the public libraries. They make information that would have only been available and accessible only libraries locally widely accessible, and they lead in the new ways of categorizing and managing information.

In South Africa, libraries are increasingly designating special physical spaces as dedicated and organised workspaces within their buildings (Allen, Mark & Bickhard 2011; Lynn 2011; Roberts 2007). The Library Incubator (2013) and Turner, Welch and Reynolds (2013) have described this development as the latest in the academic and other libraries. The Library Incubator (2013) further described the spaces as makerspaces, a collaborative learning environment where people come together to share and learn new skills. Rather than any special information materials, the makerspaces are generally believed to symbolise community mind-set of partnerships, collaboration, and creation (Madison, Strandburg & Frischmann 2016). Libraries are also building online information environment in the library and a graphical user interface, and a single search engine was created to enable library users have access to digital information. Library users could access library catalogues, books, internet, and journals, among others.

How does this emerging knowledge commons explain the situation with the libraries and the experiences of the librarians and users in the public libraries in South Africa? How does the new library and its workforce cope with the variability and complexity of knowledge resources consisting multiple categories of information goods, and services and regimes? Evidently, library and information service providers in these libraries are already experiencing rapid changes in the way library services are offered. Particularly the demands of the library users have changed tremendously in line with the peculiar ways in which information technologies facilitate

information service delivery. For instance, many library visitors are beginning to demand and much of the times utilise self-services which are facilitated by information technologies. There is also increasing resort to electronic resources, and there is great demand for electronic services that are either not available in the library or are not implemented.

There is evidence that knowledge commons is emerging in South Africa (Daniels, Darch & Jager 2010). Different institutions that implement the commons do so using different names: learning commons, research commons, among others; however, the core service ideals remain essentially the same source. The University of Cape Town established a commons in 2001, Witwatersrand, Johannesburg, and Kwa Zulu Natal among others have created spaces in their libraries to serve the commons purposes. In the same vein, the public libraries across South Africa have also embraced the emerging practice; many of the libraries are creating makerspaces to promote learning and collaboration among library users (Slatter & Howard 2013).

The emergence of knowledge commons in South Africa fits the mission and vision of public libraries. Public libraries are sources of information and documents to communities and their resources are made accessible to the entire community. Public libraries enable ordinary people, at little or no direct cost to the user, to gain access to information materials from which they may gain knowledge, information, cultural experience, lifelong learning, awareness and entertainment (Shillinglaw & Thomas 1988). The South African Public Library and Information Services Bill (2012) elaborates that information services in public libraries should facilitate, promote and develop the information literacy, and communication and technology skills of their library users.

South Africa has been reinforcing its libraries in the recent years. Ten public libraries in Thabo Mofutsanyana District were among the recipients of the Country Grant Project in South Africa known as Mzansi Libraries On-line Project previously funded by the Bill & Melinda Gates Foundation. In South Africa, originally, the programme was approved as a pilot project for two years from 2014 until 2015, with the National Library of South Africa (NLSA), Libraries and Information Association of South Africa (LIASA) and the Department of Arts and Culture (DAC) (National Library of South Africa 2014) as host. This project has enhanced and strengthened the lives of the community members. The information technology applications were the key drivers

of the project that saw the implementation of various computers, e-readers, games and tablets among others, aimed at enhancing library services and strengthening the learning experiences in the community.

According to Beagle (2006:3), “the new paradigm for service delivery in the public libraries, and this emergence is linked to the rapid digital applications”. Many libraries are consciously transforming to knowledge commons while the intrusive and pervasive nature of information technology impose knowledge common practices on others. When consciously implemented, knowledge commons involve the design and deployment of suites of manual and electronic information services and resources that enable and drive learning and innovation; attract, motivate and facilitate research; allow for happy collaborative accidents to occur; and provide an environment for dynamic, interdisciplinary research that advances learning (Nwagwu 2017). At other times, library managers observe the changing library needs and services, and the role of information technologies are playing in this regard and therefore adjust their activities in order to meet users’ needs. Knowledge commons is an innovation that is fast changing the landscape, meaning and role of the library as well as transforming the practice of librarianship and information services.

Public libraries are compelled to absorb user and user demands in such a manner that ensures that library users share and collaborate information and knowledge in ways which were unavailable previously. Knowledge commons are emerging in South Africa. In the same vein, public libraries in South Africa are embracing the emerging practice by creating makerspaces, promoting interaction, learning and collaboration among their users. The study focused on the emergence of knowledge commons in nine Thabo Mofutsanyana public libraries to design a framework for understanding and implanting the delivery of digital services in the community.

The presence of information technology applications in Thabo Mofutsanyana District public libraries, like in other libraries, points to, and supports the emergence of knowledge commons. With methods of delivering services that differ from the traditional approaches, the knowledge commons demand of these libraries relates to the role that these public libraries and their librarians were designed to play in transforming library into a learning space, engagement in community

development, knowledge sharing and information dissemination. The Thabo Mofutsanyana District public libraries are compelled to absorb user and use demands by adjusting their regular services delivery methodologies to ensure that library users collaborate, and share knowledge in ways that were previously unavailable, and that these services align with modern library standards (Lihn 2008). These transitions conform to the global events in which knowledge in all its forms; value networks justice human capital, methodology, collection, management, technology and innovation are the central and critical sources of competitive advantages.

In their study that focussed on the knowledge commons in the University of Cape Town, Daniels et al (2010) found that the commons are serving the purpose for which it was established. However, they observed that, "... rather than signalling a shift in direction of information service delivery, the emergence of knowledge commons heralds a re-dedication to the partnership required to provide information to the communities" (Daniels et al 2010:9). How does the institutional arrangement of the new library relate to the biophysical resources, the community of users, actors and the rules-in-use or library norms in a manner that results to interactions whose outcomes satisfy library user's needs? Significantly, information technology applications are playing key roles in the libraries in the District with the implementation of various computers, e-readers, games and tablets among others, aimed at enhancing library services and strengthening the learning experiences in the community (National Library of South Africa 2016). Often, social structures and technology co-evolve in an emergent and non-deterministic way process that affects the efficiency of any existing technology (Adler & Borys 1993; Bijker, Hughes & Pinch 1987). The implementation of information technologies in these libraries must be associated with disruptions that arise due to differences in the original training and environment of the libraries.

Interactions in the study area showing that libraries and information service providers in these libraries are already struggling to cope with rapid changes in library users' information behaviour. Particularly the demands of the library users have changed tremendously in line with the peculiar ways in which information technologies facilitate information service delivery. For instance, there is also an increasing resort to electronic resources, and there is great demand for electronic services that are either not available in the library or are not implemented. Many library visitors are

beginning to demand for, and much of the times utilise self-services, which are facilitated by information technologies.

On several occasions, users are asking for or using tutorials that are available online, and participating in online lectures and conferences, while at the same time using offline information resources, which the library has accumulated over the years. Increasingly, the shared resources used by the library users include those in the public domain such as the resources on the shelves, networks to which the libraries are connected and myriads of other resources to which the library has no control over. Library users are using any resources they can link with their studies whether copyrighted to the library or not. The rate at which library users use the library spaces for discussion among themselves and with library service providers has also risen tremendously; there is also a high level of freedom to access and use library resources. This new status of the library differs significantly from the original status of the traditional library; library space and library service providers require some retuning to match the new challenges.

In the Department of Arts and Culture (2015:3), Ralebipi-Simela the National Librarian of the National Library of South Africa has asserted that there is a growing “acknowledgement and acceptance of libraries as knowledge and cultural institutions”. She further highlighted that within this context, public libraries in South Africa have a significant role to play as gateways in their communities by providing access to information and lifelong learning. She further indicates that the introduction and inclusive of information and communication technologies has enhanced the creation of the opportunity for networked, connected and dynamic society. It is therefore important that the national web of public libraries as institutions when promoting democracy through their emergent of physical and virtual community commons provide free access to information within their communities.

Institutions where commons are emerging operate within regulatory and legislative structures. Tabarrok (2009, par. 4) argues that “not only can a commons be well-governed but the rules which are given the commons must be clearly spelt out”. In this instance, Ostrom cited in Tabarrok (2009) indicates the importance of understanding how the rules of common resource government evolve

with the emergence of commons and how better to support the resources by making legislation that does not conflict with the existing rules.

1.2 Conceptual setting

Three categories of concepts/theories: (i) the commons (ii) knowledge commons (iii) and Institutional Analysis and Development (IAD) framework, guided this study.

(i) The commons

The commons is “the cultural and natural resources accessible to all members of a society, including natural materials such as water, air, and a habitable earth” (Basu, Jongerden & Ruivenkamp 2017:24). These resources are held in common, not owned privately. Commons can also be understood as “... natural resources that groups of people (communities, user groups) manage for individual and collective benefit. Characteristically, this involves a variety of informal norms and values (social practice) employed for a governance mechanism” (Basu, Jongerden & Ruivenkamp 2017:24).

(ii) Knowledge commons

Knowledge commons refers to the institutionalized community governance of the sharing and, in some cases, creation of information, science, knowledge, data, and other types of intellectual and cultural resources (Dedeurwaerdere et al 2014). Knowledge commons refers to an approach to governing the management and/or production of a knowledge. It is a form of community management or governance and applies to resources and involves a group or community of people. The commons do not mean the resources, the community, a place, or a thing; it is rather the institutional arrangement of these elements

(iii) Institutional Analysis Development theoretical framework

Elinor Ostrom developed the IAD framework in 1985; Ostrom and other researchers (Cox, Ostrom and Walker 2010, Kiser and Ostrom 1982, Ostrom 1986, 1990, 1995, 2009) have continuously refined the framework. According to Ostrom (2009:12):

The framework was originally designed for the analysis of the dynamics of institutions and their formation. This is particularly relevant given how peer production enabled by open networks and open practices is challenging existing practices and institutions and creating new and dynamic commons pool resources that are often “informal” before becoming institutionalized or formalized (Ostrom 2009:12).

Institutions are defined as “rules, norms and behaviours that two or more people use in interacting and making decisions that produce outcomes and consequences” (Ostrom 2009:12). IAD framework has been aptly referred to as the knowledge commons Research Framework (Frischmann, Madison & Strandburg 2014). The framework provides a checklist of variables that will guide studying an institution: actors, norms, action situation, community attributes, institutional settings, research strategies, incentive structures, and policies (Ostrom 1999; 2005; Ostrom & Cox 2010). The IAD framework has been applied to study “how people collaborate and organize themselves across organizational” (Poteete, Janssen & Ostrom 2010:67) and “other boundaries to manage common resources such as forests and fisheries, which often cross or flow through national boundaries” (Poteete, Janssen & Ostrom 2010:67). The framework has also been used to study knowledge as a commons, and this cuts across institutional and national boundaries (Hess & Ostrom 2006).

The IAD framework aids in the collection of information for assessing efforts at institutional reformation and changes. The framework enables cross-institutional comparisons and evaluations (Ostrom 2005; Ostrom, Schroeder & Wynne 1993). In the absence of systematic, comparative institutional assessments, understanding transitions and reforms may be naive and not based on performance (Olowu & Wunsch 2004). IAD framework plays significant roles in identifying the “...major types of structural variables that are present to some extent in all institutional arrangements, but whose values differ from one type of institutional arrangement to another” (Ostrom 2009:9).

(iv) Emergence

Emergence is a slowly emerging concept useful in studying social systems, complex behaviours and science (Holland 1995; von Neuman 1966). In this study, the concept of emergence enabled the researcher to understand how institutions form and change. At the community level, Hess and Ostrom (2007) have identified the library, school, playground, markets, among others, as

commons. The credo of the commons is that members of a community should have unrestricted access to freely shared resources. Emergence fitted the lenses selected for this study, namely, the IAD framework which methodically supported the comparison and contrast, highlighted the underlying similarities and differences, quantitatively and qualitatively the pattern of emergence of knowledge commons in the libraries. A comprehensive conceptual and theoretical clarification is provided in Chapter Three.

1.3 Contextual setting of the study

This section provides a contextual setting of Thabo Mofutsanyana District Municipality and the public libraries. “Thabo Mofutsanyana District Municipality is a Category C municipality located in the eastern Free State province, and borders Lesotho and KwaZulu-Natal” (Municipalities of South Africa: 2012-2018, par.1). The District is named after a stalwart of the Communist party by name Edwin Thabo Mofutsanyana. Thabo Mofutsanyana District is part of the four Districts in the Free State Province in South Africa (Final Integrated Development Plan 2012-2016:5). According to the Constitution of the Republic of South Africa, a category C municipality is a “municipality that has municipal executive and legislative authority in an area that includes more than one municipality” (Republic of South Africa 1996:88). The District was established in South Africa, Municipal Structures Act 117 of 1998:14. There are 34 public libraries within the District. These public libraries were traditionally established to circulate materials and assist members of their communities to use their facilities. The advent of information technologies has tremendously influenced the libraries. The advent of Mzansi Libraries On-line Country Grant has increased the capacity of any librarian that has subject knowledge and information-technological expertise (National Library of South Africa 2016). Evidently, there must be some conflicts in the operations of these libraries as they were not originally established communal spaces that had very strong digital technologies accoutrements that provide a one-stop shop for diverse community members. A detailed exposition of contextual setting of Thabo Mofutsanyana District Municipality and the public libraries is provided in Chapter Two.

1.4 Statement of the research problem

A critical feature of the information society is the ever-growing, variety and number, and complexity of information technologies and their derivatives, and the need and pressure to adapt to changes that technology trump up such as frustrations, shock and moral panic for individuals and society (Beagle 2011; Daniels et al 2010; Hart & Kienveldt 2011; Janse van Vuren & Latsky 2009). New technologies sometimes compel transformation of older technologies, and together they actively disrupt conventional values and ways of life. This often leads to a sense of indisposition and helplessness, in addition to it challenging the abilities of individuals and society to adapt (Kercival 2011; Ostrom & Walker 2003). While these developments are positive, but they point toward increased difficulty for the information and information technology user to access and obtain the information needed in the required format, timeframe, quantity and level of detail.

Evidently, technology is not just monster that is self-propelled and unleashed into the human society and people have no choices but to adjust and adhere to its demands, but rather technology can also be understood as a social construct that is shaped by the society (Ostrom 2007; 2009; 2010). The Mzansi Libraries On-line Country Grant in South Africa have reinforced ICT applications in the libraries, but they also by this token have contributed in initiating radical changes in the way the libraries work (National Library of South Africa 2016). How does the library institution that has matured in information delivery and information services techniques in an analogue environment adapt to manage and serve users in a fluidly and digital environment?

The capacity of the libraries in the Free State to absorb the new practices occasioned by knowledge commons, the need to understand the extent of the commons in the libraries are necessary for decision making and planning to ensure that library services are not radically dislodged. How much does the emergence of the knowledge commons dispossess the libraries and librarians of control over library services, and render their capacities unaligned? Furthermore, information technology capacity, and consciousness of the current members of the communities served by the libraries are also critical to understanding the knowledge commons emergence in the District (Krubu & Osawaru 2011).

Is the emerging knowledge commons in Free State resulting to positive outcomes in respect of information needs of the communities served? Evidently, knowledge commons will present some

benefits, and pose some risks to the libraries and the users. For example, what is the implication of access to copyrighted and non-copyrighted resources in a public library? What is the effect of unmonitored and unrestricted access to information resources in digital locations that are outside the control of both libraries and library administrators on both the libraries, librarians and librarianship? There are bigger and more complex issues such as the governance and economic issues, which require to be carefully understood. Thinking through these issues suggests a critical interrelationship between the knowledge commons and characteristics of resources and community of users of a shared resource pool (Frischmann et al 2014; Hess & Ostrom 2007).

There was a need to understand whether library service providers in the Free State opinions of their library service are in line with the 21st century experiences, and whether they consider their skills appropriate enough in this regard. This study has implications for understanding virtual communities, human factors, ICT infrastructures, library spaces, maintenance, network effects, sustainability, marketing strategies, knowledge and information sharing and satisfaction of library users. How does knowledge commons translate to adequate service provision by library service providers in the District? Finally, what is the library users' assessment of the performance of library service providers during the advent of knowledge as commons? Except the work of Daniels et al (2010) which focussed on one university – the University of Cape Town, and whose objective was to understand how the space was being used, there was a limited evidence on research carried out to examine the emergence of knowledge commons and how this development relates to institutional development of the library in any of the South African Districts.

Knowledge commons is a game changer in the library, causing major reconfigurations in the design of the library; promoting self-service, and access to a wider array of electronic resources, and inviting reactions from various actors to respond to these changes. Knowledge commons highlights the significance of collaboration and provision of services to a multitude and to the different types of users. With increasing low cost of information technology devices, accessing knowledge has become very easy, and a variety the technologies have impregnated the society with new layers of information and content at the users' disposal.

Knowledge commons have been used to capture the complexity and variability of knowledge and information as resources, consisting of multiple types of information goods, services and regimes. Knowledge commons refers to “information, data, and content that is collectively owned and managed by a community of users, particularly over the Internet”. It is a knowledge space beyond the traditional library space and practice, it sustains, and transforms the knowledge acquisition experience from the library contexts, provide an integrated work environment for academics, aided by information technologies that support learning, sharing and collaboration in a largely self-service oriented manner. All scenarios that include or concern human knowledge, information, internet/WWW, and all other human activities associated with the learning, search and spread of ideas and wisdom through interaction, self-consultation and cogitation and investigations in an environment that promotes, supports and enhances birth and rebirth of knowledge and ideas constitute the principal motif of knowledge commons. In very advanced libraries elsewhere, there is an increasing use of advanced machines such as robots, to collect books and other materials from their locations to users of administrators in addition to serving dispersed populations who need access to certain information and information services that might either be available only in the libraries.

The public libraries have for a long-time emblematised knowledge and learning about community works of art, technical achievements; they have been gradually assuming the roles of behavioural and cultural change phenomena in the country. Personal and interpersonal factors, including stimulation, identity and security that influence the comfort of people using public library spaces need to be examined. Also, noise, time and ability to use technology within the space have also become very important factors to understand. Historically, the libraries were set up to function as individual workstations where individuals focus on their work in a self- oriented and self-motivated manner. But the libraries have assumed social work type of settings, encompassing integrated support rather than single - support delivery, and allowing facilities that allow for talking rather a place where “no talking” rules abound.

The emerging commons in the Free State required attention to learning spaces, digital spaces, team spaces, social spaces and personal spaces to facilitate both group and self-service engagements. This calls for the examination of the status of the libraries to assess their capacity to absorb the

new practices; there is also a need to understand the attributes of the commons in the libraries in order to know how much work would be required to implement the knowledge commons without radically dislodging existing services. How much does the emergence of the knowledge commons in the Free State dispossess the libraries and librarians of control over library services, and render their capacities unaligned? Furthermore, information technology capacity, and consciousness of the current members of the communities served by the libraries were also critical to understanding how the emergence was meeting the needs of the library users.

In the Free State, it is very crucial to examine whether the new model of library service is resulting to positive outcomes in respect of information needs of the community served. Both in orchestrated and present formats, knowledge commons posed some risks to the libraries and the users in the communities. For example, what is the implication of access to no copyrighted and copyrighted resources in a library? What is the effect of unmonitored and unrestricted access to information resources that are in places beyond the control of both libraries and library administrators on both the libraries, librarians and librarianship? There are bigger and more complex issues such as the governance of the libraries, economic issues and change management, which require to be carefully understood to ensure that the libraries serve the purpose for which they are established. Teasing these issues together indicate a critical interrelationship between the new library and the Frischmann et al (2014) IAD which examine the physical characteristics of resources and community of users of a shared resource pool. It also relates to how new technologies are adopted by people, calling into mind the widely studied innovation adoption theory of (Rogers 1995).

These new features of the library were not aspects of the traditional libraries, and librarians were also not trained to manage the library this way. How do we manage the libraries in view of this development in order to ensure adequate service delivery? Despite the relative high degree of technology applications in the libraries in South Africa, adoption of technologies is generally very slow in developing countries. Often associated with digital divide, there are several references in the literature that support that African countries lag behind in technology adoption (Srinuan & Bohlin 2011). Particularly, there is an observation about low adoption of Meta technologies, that is, those technologies that emanate from what people generally identify as technologies. Otherwise, how does one explain the slow adoption and penetration of many micro technologies

that have arisen due to the emergence of open access publishing? A major concern must be raised about the future of the public libraries in the emergence of the commons which focuses on the deployment, and implementation of modern information technologies to serve the community with common-pool-resources.

The emergence and acceptance of the commons will require attention to spaces. This calls for the libraries to assess their capacity to absorb the new practices; there is also need to understand the attributes of the commons resources in the libraries in order to know how much work would be required to implement knowledge commons without radically dislodging existing services, and disposing the libraries and their librarians with unaligned capacities. Furthermore, information technology capacity, and consciousness of the current members of the communities served by the libraries are also critical to understanding how the emergence is meeting the needs of the library users. There is no empirical research documenting the knowledge commons in the Free State, and how they contribute in meeting the information needs of the Thabo Mofutsanyana District community members. This study was required to examine whether the common pool of resources has led to improved access and satisfaction of information needs of community members.

Within the complex of these issues about knowledge commons, one may dare ask: are there clearly defined rules in place to regulate the use of the infrastructures to guarantee harmonious and productive self-organisation, and are these rules well matched to the local needs and conditions of the people? Can individuals affected by these rules participate in adjusting the rules and are the rights of the community members to make their own rules recognised by the libraries and their authorities? With respect to monitoring behaviour, is there a graduated system of sanctions? Do the members of the community have access to low-cost conflict-resolution mechanisms? How does the knowledge commons translate to adequate service provision by library service providers? Finally, what is the library users' assessment of the library services providers during the advent of knowledge as a commons?

1.5 Purpose of the study

The purpose of this study is to examine the emergence of knowledge commons in nine selected Thabo Mofutsanyana District public libraries in South Africa in order to understand the implantation of delivery of digital services to the library user's community.

1.5.1 Objectives of the study

To achieve the purpose of the study, the following specific objectives were formulated:

1. To investigate the biophysical conditions of the knowledge commons in the Thabo Mofutsanyana District public libraries,
2. To analyse the action situations that support and promote openness in the operations of public libraries in the Thabo Mofutsanyana District,
3. To investigate the characteristics and roles of the actors in the libraries in the Thabo Mofutsanyana District in terms of their cognitive capacities, information, preferences and strategies,
4. To examine the roles of libraries and librarians in influencing openness in the public libraries of Thabo Mofutsanyana District,
5. To examine the nature and extent of the interference of commons into traditional library practices - norms, rules, and laws in the Thabo Mofutsanyana District, and,
6. To investigate the characteristics and quality of the interactions that obtain among actors in the commons, and the outcomes that result from these interactions.

1.5.2 Hypotheses

As argued by Creswell (1994:34) "hypothesis is a formal statement that presents the expected relationship between an independent and dependent variable." In this study, the following hypotheses were evaluated:

1. There is no significant relationship between the material and physical conditions of the libraries and the pattern of interactions among the library users in the Thabo Mofutsanyana District.
2. There is no significant relationship between library norms, educational status of librarians and the open access resources use requirement of the library users in the Thabo Mofutsanyana District.
3. There is no significant relationship between attributes of the community digital literacy of the library users and library service outcomes in the Thabo Mofutsanyana District.
4. There is no significant relationship between incentives for participating in the commons and the actual participation in the library services in the Thabo Mofutsanyana District.
5. There is no significant difference between the willingness to donate resources and invitation to donate resources on the pattern of information resource need and use in the libraries in the Thabo Mofutsanyana District.
6. There is no significant difference between the impact of physical and non-physical artefacts on the perceived motivation for participating in the commons.
7. There is no significant relationship between length of exposure to the library and access to knowledge published in the electronic spaces and diversity of information resources in the commons.

1.5.3 Research questions

Maree (2007) described research questions as what intrigues the researcher to focus on what would be studied. The key research questions addressed in this study include:

- (i) What is the specific evidence of emergence of knowledge commons in the libraries in the Thabo Mofutsanyana District?
- (ii) How do the library users' everyday experiences and encounters in and outside the library support and inform the emergence of knowledge commons practices in the libraries in the Free State in South Africa?
- (iii) How do capacity acquisition and performance improvements embarked upon by the libraries and their staff relate to the emergence of knowledge commons?

- (iv) How do the socio-ecological and other circumstances of the actors of the libraries in the Free State contribute in the emergence of, and acceptance of knowledge commons in the communities?
- (v) What is the role of the community of users in the Thabo Mofutsanyana District in influencing public library resource use in the libraries?
- (vi) How does the host community of public libraries influence information use behaviours and library service providers of public library users?
- (vii) How does the library itself as an institution influence the behaviour of library actors and service consumers?

Table 1.1 presents the summary of the relationship between research objectives and questions that guided this study and indicated the data collection instruments and source of data used.

Table 1.1: Summary of the objectives, research questions, and the data collection instruments

Research objectives	Research questions	Population	Data collection instrument and source of data
To investigate the biophysical conditions of the knowledge commons in the Thabo Mofutsanyana District public libraries.	What is the specific evidence of emergence of knowledge commons in the libraries in the Thabo Mofutsanyana District?	Library users Library Officials Community leaders	Empirical literature A questionnaire Interviews
To analyse the action situations that support and promote openness in the operations of public libraries in the Thabo Mofutsanyana District.	How do the library users' everyday experiences and encounters in and outside the library support and inform the emergence of knowledge commons practices in the libraries in the Free State in South Africa?	Library users Library Officials Community leaders	Empirical literature Questionnaires Interviews
To investigate the characteristics and roles of the actors in the libraries in the Thabo Mofutsanyana District in terms of their cognitive capacities, information, preferences and strategies.	How do capacity acquisition and performance improvements embarked upon by the libraries and their staff relate to the emergence of knowledge commons?	Library users Library Officials Community leaders	Empirical literature Questionnaires Interviews
To examine the roles of libraries and librarians in influencing openness in the	How do the socio-ecological and other circumstances of the actors of the libraries in the Free State contribute in	Library users Library Officials Community leaders	Empirical literature Questionnaires Interviews

public libraries of Thabo Mofutsanyana District.	the emergence of, and acceptance of knowledge commons in the communities?		
To examine the nature and extent of the interference of commons into traditional library practices - norms, rules, and laws in the Thabo Mofutsanyana District.	What is the role of the community of users in the Thabo Mofutsanyana District in influencing public library resource use in the libraries?	Library users Library Officials Community leaders	Empirical literature Questionnaires Interviews
To investigate the characteristics and quality of the interactions that obtain among actors in the commons, and the outcomes that result from these interactions.	How does the library itself as an institution influence the behaviour of library actors and service consumers?	Library users Library Officials Community leaders	Empirical literature Questionnaires Interviews

1.6 Significance of the study

In the knowledge economy, Evans (2017) indicated that *Content is King*, while according to Knowledgewalls (2019) *Knowledge is Power*. These dictions are key identifiers and markers in the knowledge dispensation. Acquiring knowledge has therefore become very imperative for personal and community development. Taking into context the importance of knowledge, this thesis discusses and explores the development and understanding of an emerging practice that can enable access to knowledge by community people. This study seeks to accelerate the connection of public library users to ‘global library’ of knowledge thereby providing an understanding of information resources to foster citizenry participation, democratic values, accountability, good governance and stimulate creativity and innovation through open governance and open access to information.

This study will guide policymakers, educational leaders and library executives and managers in their practice and policy and decision making as well as change management panning. As futurists, policymakers use both trends and emerging issues in their work as they try to understand and anticipate change in society. Libraries are not used to talking about trends, but they are not new to the concept of emerging issues – this study introduces a new way of viewing the subject of change in the library.

For human to flourish, there is need for high quality relationships with one another. This explains why the open movements are often advocating for sharing culture. A typical example is the African Ubuntu culture, where people immerse themselves into one another selflessly in their capacities as producers, distributors, companions and partners. An example also exists in modern technology. For instance, the Android technology is an open-source project by Google, and it is a living proof of the benefits, and effectiveness of resource sharing. Very interestingly, human knowledge can be given a tangible form if humans decide to reveal and make public what were before now hidden in their minds. The essence of making open those unknown ideas in the human mind is to enable others benefit and profit from them. For this to occur, the ideas have to be shared; otherwise, it could be concealed from others, and sealed up eternally.

1.7 Review of empirical literature

Bless, Higson-Smith and Sithole (2013) describe a literature review as a process of finding and assessing “literature that relates to the topic to sharpen and deepen the theoretical framework of the research.” The literature reviewed in this study focussed on the commons in order to unveil how new technologies could instigate a return or rejuvenation and application of an old concept and types of commons in order to situate the specific kind of commons this study focuses on. The literature review dwelt in detail on the issue of knowledge commons, showing clearly how the characteristics of knowledge, and its fit with existing and emerging information technologies, highlight the significance of its attribute as commons. In order to examine the risks, the tragedy of the commons was examined and a relative elaborate overview of existing knowledge commons implemented in different places was given. Finally, the framework for the study namely IAD and illustrate how institutional dynamics intermix with the commons principles to provide explanation for the emergence of the new library service model was provided. The literature also examined the innovation adoption theory as it gives insight on how new technologies diffuse in the society. Finally, the literature examines the WWW as a global pool of resources that should be made available to people at no cost. A detailed literature review is provided in Chapter Four.

1.8 Motivation for the study

Over the past decades, the Thabo Mofutsanyana District public libraries have been undergoing significant changes in which the need to acquire, utilize, and share information and knowledge in the communities has been considered increasingly crucial. Evidently, these libraries certainly cannot be repository for only printed materials and books; they require other means that will maintain easy access of information and knowledge to their communities. Therefore, the advent of Mzansi Libraries On-line Country Grant advanced information technology enabled these libraries to accomplish this enormous mission. As it was indicated before, the advancement of information technologies and other spaces in these libraries was merely an accidental occurrence that coincides with global best practices of Mzansi Libraries On-line Project Country Grant. The emergence and implementation of information technologies services and communal spaces in these libraries were associated with disruptions and conflicts as they were not originally established and shaped as knowledge commons that provide diverse community members.

The research was motivated by the absence of empirical study focusing on knowledge commons and institutional development in the public libraries. This study encompassed rigorous comparative research that builds towards the application of IAD in the understanding of the commons. Systematic comparative research is particularly important for the study of knowledge commons, which is still in its infancy. As Frischmann put it, “structured inquiry will provide a basis for developing theories to explain the emergence, form, and stability of the observed variety of knowledge commons and, eventually, for designing models to explicate and inform institutional design” (Frischmann et al 2014: 2).

1.9 Scope and delimitation of the study

Scope of a research basically entails how the researcher figuring out exactly what the study will cover and its focus. The scope entails the topic, geographical and time. The parameter under which the study operates is referred to as the scope of the study (Simon & Goes 2013). The research must fit within certain parameters. A study, does not matter how well it is scheduled and conducted, has

its own internal/ formal or external limitations (Simon & Goes 2013). A researcher cannot examine every aspect of the subject of interest and there must be a clear delineation of what would be the focus of the research. Usually, a clear delineation of scope should include geographical coverage, title, time, and others.

This study was carried out in the Thabo Mofutsanyana District Municipality. The libraries were Bohlokong, Moemaneng, Leratswana, Fateng tse Ntsho, Zamani, Petsana, LS Sefatsa, Mashaeng and Meqheleng. The criterion for focusing on these libraries is that these libraries were those involved in the implementation of the Mzansi Libraries On-line Country Grant services. Mzansi Libraries On-line project followed a roll-out national grant project that was implemented to promote the use of ICT equipment such as computers and tablets with Internet access and online game gadgets in the libraries in South Africa in 2016 (National Libraries of South Africa 2016). Evidently therefore, the commons is naturally expected to be more vigorously implemented in these libraries than the other libraries.

Emergence is a complex concept, and how to deploy it has always been an issue of serious contention (Lewes 1875). In fact, it was the challenge of measurement particularly, that silenced the concept shortly after it was brought to light by Lewes in 1875 (Holland 1998). However, many studies that have drawn from emergence have used the concept to highlight new developments that swoop on humanity and that defy fundamentally established principles and practices. In the case of the present study, the changes in the library and information services as a result of the rapid deployment of the knowledge commons runs contradict basic library use rules and norms, and yet the knowledge commons have been accepted by both the library user, librarians and the community. The concept of emergence supplied basic motivation and impetus required to insert the commons as a necessary intruder into traditional information space; but data was collected using survey tools and analysed using standard statistical techniques.

1.10 Research methodology

According to Babbie (1989), research methodology is focused on the specific tasks of the research process such as research design, data collection or sampling, among others. Howell (2013) and

Katsicas (2009) consider methodology as the general strategy for research that outlines the way in which the research will be to be undertaken and, identifies among other things, the methods to be used carrying out the research. These methods, define the means of data collection or, and sometimes, how specific results are to be obtained. In this regard, attention is directed at the kinds of processes and procedures that will be followed address the stated objectives.

The research design and methodology of this study were informed by the research paradigms and philosophical assumptions. Generally, a research undertaking touches on four major philosophical assumptions, namely, ontology, axiology, methodology/approach, epistemology, and rhetoric. The present study was guided by quantitative and qualitative approaches, a mixed methods approach (Bryman 2012; Creswell 2014; Gobo 2008; Kothari 2004; Leedy & Ormrod 2010; Neuman 2013; Schwandt 2007; Silverman 2013). These approaches are also known as strategies or traditions, with little differences (Bryman 2012; Neuman 2013). A detailed research methodology is discussed in Chapter Five.

1.11 Originality of the study

A distinctive feature of a doctoral thesis lies in its contribution to knowledge, and it is on this basis that the originality of a study can be assessed. To assess the contribution of a study to existing knowledge, one must undertake an examination of the research focus, the objectives addressed, the methodology applied and the evidence that emanates from the study. As vague as the concept of originality is, a study can be assessed for originality using a variety of the issues (Phillips & Pugh 2005). Blaxter, Hughes and Tight (2006) have suggested that the originality of a study is usually practically small. This small contribution is however enough to assess the contribution which a study makes in an area.

This study is on an emerging study area. Although the commons is old in the literature, traceable to environment of the struggles of ownership of humanity's commonly shared resources during the mid-17th century, its application in the field of information is a recent affair. There are many existing studies that have addressed the question of information technology use in the public libraries in South Africa; however, empirical studies that examine how information technology

has promoted knowledge commons in the public libraries do not exist. De Vries' (2016) study highlighted the transformation of a commons space which was largely unused and unsafe into a publicly regulated, privately maintained free-to-the-public park.

Furthermore, the study of Matatiele (2020) focussed on the planning processes of the conversion of traditional academic libraries to research commons. Her study resulted in the identification of factors that are critical for such a process. These factors include formation of a library research consortium, ongoing space assessment, establishment of one-stop multifunctional spaces among others. Empirical studies in the area of commons is very few in South Africa, while other libraries in various parts of the world have already transformed into commons.

Very crucially, this study adopted the IAD framework that is immersed in sociology of institutions to understand and explain the emergence of the knowledge commons in the libraries. Sociological viewpoints about how open science communities are formed are very novel. Connected to this, studies examining the role of the various actors in promoting knowledge commons in the library, and how their roles influence evolution of new learning practices and environments, have not been identified.

In his most recent book, "*Emergence: From Chaos to Order*", Holland (1998) described emergence as an essential property of complex systems. According to Holland (1988), when viewed from the perspective of systems sciences, the conceptualisation of emergence is a breakaway from the traditional theories through its focus at the transitional effects of the persistent patterns and system changes instead of end points where a system might have reached an equilibrium. The deployment of the relatively un-studied concept of emergence makes novel contribution to the study of the new forms of modern library.

1.12 Operational definition of terms

The study includes key terms that are not extensively known and recognised outside the researchers' discipline; therefore, it is important to offer the reader a list of definition of these key terms (Harvard Extension School 2020). The aim of this section is to provide a brief précis of key

terms used throughout this study. Definition of terms is an alphabetical list of terms or acronyms that a researcher considers important and provides in his or her research. The terms are particularly those that are ambiguous, those used in a special way or those from outside the researcher's discipline. They usually include theoretical constructs and formulas. They could be operational definitions which may differ from informal definitions, schools of thought and discipline-oriented acronyms or concepts that feed directly from existing authorities. In this study, a combination of conceptual and operational definition of terms is adopted.

1.12.1 Public Library

A public library is described as a community centre that has potential to reach all the parts of the community (Laporte & Ayers 2015).

1.12.2 Knowledge Commons

Commons refers to a form of community management or governance of natural resources, particularly those that are accessed free of charge by users (Ostrom 1990). Commons do not denote "the resources, place, thing or the community. Rather commons is the institutional arrangement on how these resources are managed for maximal benefit of the community (Oteman, Wiering & Helderman 2014).

1.12.3 Emergence

For the purpose of this study, the researcher defined emergence as a development, occurrence, an evolution, a manifestation of a type of change whose exploitation defies existing rules, norms and practices but is all the same accepted as beneficial and useful to society.

1.13 Ethical consideration

In relating ethical considerations to research conducted with humans, most definitions either implicitly or explicitly accentuate the importance of moral principles, values, obligations, and the protection of the people from any danger and harm throughout the research process (Morrow & Richards 1996; Sieber 1993).

The University of South Africa (UNISA) Research Ethics Policy practice and promotes four internationally recognized moral principles in research, namely, respect for person, non-maleficence, beneficence, and justice (University of South Africa 2016). Hence, the researcher requested permission from the Acting Director of Free State Library Services and District Manager of Thabo Mofutsanyana District libraries to conduct and collect data for this study in the nine participating libraries. The researcher knew both what ethical obligations were and what resources were available to them during data collection. This means that respondents were not compelled to participate in this study; participation was voluntary, and participants were given the option to remain anonymous. Furthermore, the purpose for conducting the study was outlined, in order to give the respondents an understanding of the reasons for including them in the study. At that point, if there were any hazards or risks involved during the data collection process, the respondents were to be informed of any dangers that might possibly arise (Creswell 2014).

The researcher understood that any false report for the purpose of benefiting herself or other third parties was considered unethical; hence voluntary participation of the respondents was important. The authenticity of the information collected from the respondents was concerned when writing up this thesis. Protection of the respondents was ensured in terms of confidentiality and privacy during the process of data collection, data analysis, publishing of the outcome of the research and sharing of findings, or any part of, of the study. The researcher ensured that respondents were not revealed to anyone including the library management and it was only meant for the purpose of the research.

1.14 Organization of the study

The study was organized into nine chapters. Chapter One provides necessary background of the emergence of knowledge commons in the public libraries, including the problem statement and research questions. This chapter also clearly define the key concepts of the study. Chapter Two discusses the contextual background to the study highlighting the historical background of the public libraries in South Africa and related concepts, while Chapter Three deals with conceptual and theoretical clarification. The review of empirical literature is presented in Chapter Four. Chapter Five deals with the research methodology, while Chapter Six entails presentation of the quantitative data while Chapter Seven presents' data analysis and presentation. Chapter Eight provides interpretation and discussions, while Chapter Nine covers the summary, conclusions, and recommendations arising from the study, as well as highlighting suggested further research.

1.15 Synthesis of the chapter

Chapter One has introduced the essential research problem of the study and then laid down the foundation of the chapters. The chapter focuses on the advent of new technologies which resulted in the emergence of knowledge commons that posed a challenge for new development of library physical spaces, physical technology infrastructures, open access, provision of multimedia and information resources and new service delivery. Further, this chapter discussed the conceptual setting, statement of the problem, purpose of the study, significance of the study, review of empirical literature and motivation for the study. Also, this chapter presented the scope and delimitation of the study and clarifies the concepts and theories which would be detailed in Chapter Three. The chapter finally discussed the originality of the study, highlighted the research methodology, followed by definitions of key terms and ethical considerations. The next chapter presents the contextual setting of this study.

CHAPTER TWO

CONTEXTUAL SETTING OF KNOWLEDGE COMMONS IN THE PUBLIC LIBRARIES IN THABO MOFUTSANYANA DISTRICT MUNICIPALITY

2.1 Introduction

This present chapter describes one of the basic aspects of any research namely the contextual background of the study. In the social science research, research context refers to the social factors that inform the study within a chosen milieu (Bhattacharjee 2012). Research context consists of dynamics that relate to the place, the people, population, roles, norms and practices and activities that directly or indirectly relates to the focus of the study (Bhattacharjee 2012). Study context include how the problem being addressed situates within the geographical area and practices. It also locates the study in respect of the logical situation such as evolutionary and developmental issues that speak to the problem being studied. This chapter is subdivided into four sections. The first part focused on the historical aspect of the study area. Following this, there is a discussion of Legislation and Institutional Framework, thirdly, Mzansi Libraries On-line projects and their embrace of the Mzansi Libraries On-line Country Grant advent and how this relates to the emergence of knowledge commons in the nine Thabo Mofutsanyana District public libraries that qualify to be included in the study. Finally, the chapter links the commons in South Africa with societal realities latched on the Ubuntu philosophy aimed at creating a society where inequality and racism are eradicated.

2.2 Historical background of public libraries in South Africa

History reveals that libraries existed in the ancient and literate civilization. However, Ralebipi-Simela (2015) mentioned the fact that according to the historical accounts, there were libraries in South Africa before the 18th centuries. This is attested by Lor (1996) who indicates that the establishment of libraries in South Africa dates back to the 18th century when Joachim Nicholas von Dessin, a distinguished collector arrived in the Cape in 1727 with a possession of manuscripts and book collection over 3,800 volumes. In his study, the donation was for the public use, and it was left to the consistory of the Groote Kerk, the Dutch Reformed Church of Cape Town (Lor

1996). Money was also left for the church to add on to the existing collection after his death in 1761. In 1795, the Cape of Good Hope was taken by the British and handed over to Britain in 1814 (Lor 1996). Following this, in 1818, the British governor Lord Charles Somerset launched the first South African Library with the money accumulated from wine tax levy (Lor 1996; Satgoor 2015; Shillinglaw & Thomas 1988). Satgoor (2015: 98) asserted that proclamation of 1818 stated that this public library:

“...shall be open to the public, and lay the foundation of a system, which shall place the means of knowledge within the reach of the Youth of this remote corner of the Globe and bring within their reach what the most eloquent of ancient writers has considered to be one of the finest blessings of life, Home Education” (Satgoor 2015: 98).

However, due to lack of funds this first library was transformed into a private subscription library which later developed the basis of public libraries (Shillinglaw & Thomas 1988). This initiative led to the establishments of other dominant type of private subscription libraries own by private subscribers which ended in 1928 (Shillinglaw & Thomas 1988:270). In 1928, Carnegie Corporation of New York (CCNY) commissioned two librarians to investigate the state of library services in South Africa, of which according to Mhlongo (2018:40), “the needs of Black majority were realised”. The visit of CCNY was fundamental to the fact that it initiated, recommended and supported the concept of access to free public library services to all. In his report, Ferguson one of the librarians that were sent to investigate South African library services, explained that one of the challenges that hinder South Africa is racial issues:

“...the South African is willing... for the native to cook his food, care for his children, keep his household in order, serve him in a personal way, carry his books to and from the library, but he would feel that an end of his régime were at hand if this same servant were permitted to open these books and to read therein.... Nevertheless, so far as the native is able to use books, they ought to be made available to him; though no sane person would advocate the circulation of the same books to all... There can be little question that he has the sympathy of an active body of citizens who are working at all times for his better and more reasonable development along lines best suited to his racial limitations” (Lor 1996: 237-8).

Although after the 1928 Bloemfontein conference, several library service points were operational and available to Non-Europeans in South Africa, Mostert (1999) mentioned the fact that services for the Black population suffered due to “lack of financial support when they were transferred

from provincial councils to the Department of Native Affairs in 1954” (Mostert 1999:9). Mostert (1999) further explained that there was an encouraging initiative in 1974 when a public library in Johannesburg was accessible to all the ethnicities in South Africa. However, languages use for communication in the library collection did not meet the needs of that community. It is under those circumstances that Thomas Childers, “a pioneer of community information provision in the United States, used the term information poverty to describe the lack of basic survival information experienced by large number of people” (Stilwell 1991:18).

Mhlongo (2018) states that apartheid policies in the pre-1994 public libraries in South Africa were differently and unequally composed and resourced according to race. This impression was attested to by Satgoor (2015) that 1994 was the turning point of South Africa as an effort to redress the inequalities executed by apartheid regime for forty-six years. Evidently, since post-apartheid, South Africa experienced chronological achievements, even though, it is still experiencing national and international issues of inequalities, unemployment and lack of basic primary services to all of the population (Department of Arts and Culture 2015). In her article, “Leadership Excellence in African Librarianship – the Carnegie Library Leadership Development Experience, Satgoor (2015) mentioned that despite the challenges facing LIS sector, European Union, British Council, Andrew Mellon Foundation, CCNY and Bill & Melinda Gates Foundation contributed hugely to the development of the LIS. Approximately \$200m were spent in the form of grants to develop “existing library buildings, design of new buildings, purchase of resources in all formats, training and development of librarians with a special emphasis on leadership, technology in academic libraries, meeting the research needs of emerging African researchers and scholarships for acquiring professional and post-graduate qualifications” (Satgoor 2015:18).

It is therefore evident that the LIS sector, through the initiatives and determination of internal and external entities’, resolved some of the challenges derived from the apartheid regime. Due to the after effects of the apartheid, many communities still lack access to information services (Department of Arts and Culture 2015). According to the Republic of South African Constitution, Schedule 5A stipulates that public libraries form part of the provincial competency of Provincial Library Services (Republic of South Africa 1996).

In 2007, the Department of Sport, Arts, Culture and Recreation undertook an effort to support Provincial Library Services through a conditional grant which enables South Africans to access knowledge and information resources that will enhance their socio-economic situations (Department of Arts and Culture 2016). However, the study of Mhlongo (2018:42), stated that according to Department of Sport, Arts, Culture and Recreation of 2013 “review of provincial spending on public libraries, “most provinces do not budget for libraries but instead use the conditional grants to supplement their budgets” (Mhlongo 2018:42).

The following factors are achieved in the South African public libraries, through the National Library of South Africa, as an effort to offer professional services to the Department of Sport, Arts, Culture and Recreation (Department of Arts and Culture 2016):

- i. Activities that promote libraries
- ii. A culture of reading, writing and publishing is encouraged
- iii. Training is provided in library disaster management, conservation and preservation
- iv. Training is provided in Resource Description Access (RDA)
- v. Legal Deposit Co-ordination
- vi. Development of the Library Transformation Charter and Library Policy Framework
- vii. Access to library and information services is provided through ICT connectivity

Besides the community and public libraries conditional grant, the National Library of South Africa was given a R32 million as a grant from the Bill and Melinda Foundation to pilot the Global Libraries Projects for a period of two years, and the project was named Mzansi Libraries On-line. According to the National Libraries of South Africa (2016), the pilot project included training library staff in redesigning library interiors, expanding ICT in public libraries which included training the library staff in ICT and also supporting community development with new library services. The success of the two years pilot project resulted to the Mzansi Libraries On-line Country Grant which affected 10 Thabo Mofutsanyana District public libraries in the Free State province.

This project provided some impetus for the current study that examined the emergence of Knowledge Commons in nine selected Thabo Mofutsanyana District public libraries in South Africa.

2.3 Legislative and institutional frameworks

The South African Public Library and Information Services Bill (2012) provides that information services in the public libraries should embrace the promotion and facilitation of the development of information literacy, and information and communication technology skills of their library users. The South African Public Library and Information Services Bill (2012) also regulates public libraries' norms and standards. Public libraries in South Africa face a lot of challenges physical, logical and cognitive accessibility of the libraries, distance, cost, usability and other factors (Salman, Mostert & Mugwisi 2018).

The National Council of Library and Information Services (NCLIS) which is a statutory body of Library and Information and Services (LIS) was established in 2004, according to Ralebipi-Simela (2007) this was an important historical milestone in the South African Librarianship. The council was a national body with the mandate to advise the Ministers of Education and Arts and Culture on issues related to library and information services. In addition, transformation and redress in the LIS sector is coordinated by NCLIS (Department of Arts and Culture 2009). LIS was experiencing underestimation as a sector, underfunding, collection that does not meet the educational needs of the community they serve, disparities caused by the apartheid policies which disrupt free access to library services among others. To demonstrate the importance of the council, both the Department of Arts and Culture and NCLIS mobilised a team which consulted users of services, scholars and other stakeholders to establish LIS Transformation Charter in 2009 and was revised in 2014 to address the challenges faced by LIS (Mhlongo 2018). The LIS Transformation Charter investigated the reasons behind the challenges; and, also had the empirical evidence in the provinces that there are still many innovative programmes and commitment among LIS practitioners (Department of Arts and Culture 2014). According to the Department of Arts and Culture (2014: 80), the *Charter* envisages:

“monitoring and evaluation as a process carried out throughout the intervention lifecycle, including prior to the development of an intervention (diagnostic evaluation), to confirm the design (design evaluation), to assess progress and how the implementation can be improved (implementation evaluation), to assess impact (impact evaluation) and to see the relationship between costs and benefits (economic evaluation)” (Department of Arts and Culture 2014: 80).

Through the recommendations outlined by the LIS Transformation Charter, it envisions the opportunities that will lead to the transformation of the LIS sector which will be accessible to all South African citizens (Department of Arts and Culture 2014). Undeniably, South African Library and Information Services (LIS) are operating within documented Legislative and Institutional Frameworks. Ralebipi-Simela (2015:3) stated Legislation and Governance that govern the LIS sector as follows:

- i. The Copyright Act (Act no. 98 of 1978)
- ii. The Constitution of the Republic of South Africa (Act no. 108 of 1996)
- iii. The Legal Deposit Act (Act no. 54 of 1997)
- iv. The National Library of South Africa Act (Act no.2 of 1998).
- v. State Information Technology Agency Act (Act no. 88 of 1998)
- vi. The South African Library for the Blind Act (Act no. 91 of 1998)
- vii. The Public Finance Management Act (Act no. 1 of 1999 as amended by Act 29 of 1999)
- viii. The National Council for Library and Information Services Act (Act no. 6 of 2001)

Equally important, she highlighted documents and policies that have impact in the LIS sector (Ralebipi-Simela 2015: 3):

- i. The Education Laws Amendment Act 31 of 2007.
- ii. The Department of Basic Education gazette on regulations regarding Minimum Uniform Norms and Standards for Public School Infrastructure in which school library/ media centre was listed as core education area, including specifications for its minimum size.
- iii. The Protection of Personal Information Act (Act no. 4 of 2013)
- iv. The National Archives and Records Services Act (Act no. 43 of 1996)
- v. The White Paper for Post-School Education and Training (2013)

- vi. The United Nations Convention on the Rights of Persons with Disabilities and Optional Protocol
- vii. The Marrakesh Treaty - to facilitate access to published works for persons who are visually impaired or disabled in respect to print.

Libraries in South Africa were established to promote literacy in the communities through the strategy of making reading and information service easy to access, and to promote the culture of reading and learning. Public libraries in Thabo Mofutsanyana District are equipped with internet facilities, and many of them have access to digital support services, however, it is not known whether they are in line with the trending of the emergence of knowledge commons or not. Hence, these libraries are regarded as civic focal points and hubs for the resource in the community through computer based free access services with emphasis on skills transfer and acquisition, development and growth. These libraries have in their circulation about 3 320 items every month, with the patron statistics of 23 919 registered members according to the Free State Provincial Library Services statistics.

The Constitution of the Republic of South Africa, Schedule 5A clearly indicates that except than the national libraries, other libraries are within the functional area of provinces (Republic of South Africa 1996: 160). However, the provinces are compelled to have agreements with municipalities to generate funds to run the libraries. Free State Library and Archive Services had a Memorandum of Understanding or service legal agreement that regulates the public libraries functional areas in this regard.

2.4 Thabo Mofutsanyana District municipality: historical context

Free State is known as a rural province of mountains, with goldfields and vast farmland. It is in the centre of South Africa, and encircled by other provinces which are Mpumalanga, Eastern Cape, Gauteng, Western Cape, Kwazulu-Natal, North West and Northern Cape, as well as the Kingdom of Lesotho (Municipalities of South Africa 2012 – 2018). The province is the third largest one in South Africa, with 129 825 km² (50 126 square miles) (Statistics South Africa 2012). It is subdivided into eighteen local municipalities and one metropolitan municipality namely

Mangaung Metropolitan Municipality (Municipalities of South Africa 2012 – 2018). Free State province comprises of four District municipalities and one metropolitan municipality which are Fezile Dabi, Lejweleputswa, Xhariep, Thabo Mofutsanyana and Mangaung Metropolitan Municipality (Municipalities of South Africa 2012 – 2018). Figure 2.1 shows the Free State province map illustrating four Districts including Mangaung Metropolitan Municipality (Municipalities of South Africa 2012 – 2018).



Figure 2.1: Map of Free State illustrating four Districts and one metropolitan municipality (Image from Municipalities of South Africa 2012 – 2018)

Thabo Mofutsanyana is an emerging District municipality that is named after Edwin Thabo Mofutsanyana, a leading member of the Communist Party. It consists six local municipalities, namely, Dihlabeng, Mantsopa, Nketoana, Maluti-a-Phofung, Phumelela and Setsoto that come together in a District council (Final Integrated Development Plan of Thabo Mofutsanyana District Municipality 2012-2016; Municipalities of South Africa 2012 – 2018; Thabo Mofutsanyana District Municipality 2016).

Thabo Mofutsanyana District Municipality is a category C municipality defined by the Constitution of the Republic of South Africa (Republic of South Africa 1996:88), as a “municipality that has municipal executive and legislative authority in an area that includes more than one municipality” (Worklaw 2019). Figure 2.2 illustrates the Thabo Mofutsanyana District with six municipalities (Municipalities of South Africa 2012 – 2018).



Figure 2.2: Map of Thabo Mofutsanyana District municipality showing six municipalities (Image from Municipalities of South Africa 2012 – 2018)

The District was established by the Municipal Structures 1998, Act of 117 in the Eastern Free State province, and it bordered on the Kingdom of Lesotho, Mpumalanga and KwaZulu-Natal. According to Statistics South Africa (2012), the District population was estimated 769 761 and it is regarded as one of the Districts that is having the highest non-urban population estimated 59.8% in the (Statistics South Africa 2012).

2.5 Thabo Mofutsanyana public libraries

There are 34 public libraries within the District. These public libraries were traditionally established to circulate materials and assist members of their communities to use their facilities. The advent of information technologies has tremendously influenced the libraries. The advent of Mzansi Libraries On-line Country Grant has increased the capacity of any librarian that has subject knowledge and information-technological expertise (National Library of South Africa 2016). Evidently, there must be some conflicts in the operations of these libraries as they were not originally established as communal spaces that had very strong digital technologies accoutrements that provide a one-stop shop for diverse community members.

The Annual Reports of Thabo Mofutsanyana District public libraries often document the activities and social responsibilities related to the advent of Mzansi Libraries On-line Country Grant services (National Library of South Africa 2016; ProLib 2018). They also record the achievements of these public libraries in reducing the deficits in the efforts to meet the knowledge and information needs of their library users. These records show that the use of Thabo Mofutsanyana District public libraries is increasing day by day (ProLib 2018). Librarians' experiences show that multiple types of knowledge are increasing becoming the character of information use of the library users. Users are increasingly making demands that encompass code, bandwidth, databases, libraries, and archives among others; they want to have access to data, visualize and manage data.

The Local Government Transition Act 151 of 1993 listed public libraries as a function of metropolitan municipalities during the transition from minority rule to democracy in 1993 (Rawat 2000). However, it did not specify a role for non-metropolitan local councils (Rawat 2000). In these areas, municipalities that were providing library services simply continued to do so as in the case of the Free State Provincial Library Services. The Free State Provincial Library Services has operational 183 libraries (ProLib 2018).

It is therefore encouraged by UNESCO/IFLA (1994) that all the spheres of government must directly or indirectly support the development of public libraries. Acknowledging the fact that governments must support the growth and development of public libraries, in the Free State

particularly, the focus is on improving the physical technology infrastructures of all public libraries so that they can meet the information and technological needs of the communities. These public libraries also provide e-lending services known as Overdrive and they are all connected to internet (ProLib 2018). Thabo Mofutsanyana District Municipality comprises of 34 public and duo-purpose libraries (ProLib 2018).

Public libraries in Thabo Mofutsanyana function as a holistic agency of their society (Reith 1984). Reith (1984:5) further view the libraries in relationship to their role, and three factors that has effect to the library as an organization: (i) “society and its influence”; (ii) “the role of libraries in meeting societal needs”; and (iii) “the dissemination of information and knowledge”. The study of Shillinglaw and Thomas (1988:259) eloquently describes public library as a local hub of “information and knowledge which is accessible to the public”. These libraries are supposed to incorporate a multiple of access points along with capacitated and skilled librarians and resources that will assist library users to create their own knowledge within the physical commons (libraries) (Beagle, Bailey & Tieney 2006). Beagle et al (2006:12), further describes the physical commons:

“as a new type of physical facility or section of library specifically designed to organize workspace and service delivery around an integrated digital environment and the technology that supports it” (Beagle et al 2006:12).

The public library is an organization that has a collection of information resources with specific purpose of obtaining, preserving and making available recorded information and knowledge to meet the information needs of their communities. The efficiency and effectiveness of these public library as an information tool of reading, researching and learning is determined by the success of providing users with physical commons conducive and information and knowledge that will meet their information needs.

In his study that focuses on the roles of libraries as commons, Beagle et al (2006) indicated that these libraries intended to shape and integrate physical facilities which appears to provide a paradigm of spaces which is influenced by the emergence of information technology. Having identified the physical commons which is influenced by the computer-generated identity and their annual reports. Evidently, public libraries of Thabo Mofutsanyana District Shillinglaw and

Thomas (1988) enable ordinary people at little or no direct cost to the library user to gain access to the information materials from which they may obtain knowledge, cultural experience, information, awareness, lifelong learning and entertainment.

The UNESCO/IFLA (1994) Public Library Manifesto provides that public libraries must be guided by a set of guidelines at the core of their services:

- i. Creating and strengthening reading habits in children from an early age,
- ii. Supporting both individual and self-conducted education as well as formal education at all levels,
- iii. Providing opportunities for personal creative development,
- iv. Stimulating the imagination and creativity of children and young people,
- v. Promoting awareness of cultural heritage, appreciation of the arts, scientific achievements and innovations,
- vi. Providing access to cultural expressions of all performing arts.
- vii. Fostering inter-cultural dialogue and favouring cultural diversity,
- viii. Supporting the oral tradition,
- ix. Ensuring access for citizens to all sorts of community information
- x. Providing adequate information services to local enterprises, associations and interest groups,
- xi. Facilitating the development of information and computer literacy skills, and,
- xii. Supporting and participating in literacy activities and programmes for all age groups and initiating such activities if necessary’,

Table 2.1 shows the total number of public and dual purposes libraries in Thabo Mofutsanyana District with their location and estimated population according to Census of 2011 (Statistics South Africa 2012). The District is having other types of libraries; however, the study is only focusing on the nine public libraries in the Thabo Mofutsanyana District.

Table 2.1: List of 34 public and dual-purpose libraries in the Thabo Mofutsanyana District

Public Libraries in Thabo Mofutsanyana District	Location of the Libraries	Estimated Population
Bohlokong Public Library	Bethlehem	35 003
Moemaneng Public Library	Marquard	1 033
Leratswana Public Library	Arlington	3 743
FatengtseNtsho Public Library	Paul Roux	5 715
Memel Public Library	Memel	6 523
Petsana Public Library	Reitz	3 362
LS Sefatsa Public Library	Senekal	22 076
Mashaeng Public Library	Fouriesburg	12 310
Maqheleng Public Library	Ficksburg	35 848
Intabazwe Public Library	Harrismith	4 661
Reitz Public Library	Reitz	3 362
Vrede Public Library	Vrede	17 688
Warden Public Library	Warden	10 977
Ezenzeleni Public Library	Warden	10 977
Kestell Public Library	Kestell	8 269
Marquard Public Library	Marquard	1 033
Senekal Public Library	Senekal	22 076
Bethlehem Public Library	Bethlehem	16 236
Bakenpark Public Library	Bethlehem	16 236
Rosendal Public Library	Rosendal	4 132
Clarens Public Library	Clarens	6 379
Lindley Public Library	Lindley	12 000
Ntha Public library	Lindley	12 000
Petrus Steyn Public Library	Petrus Steyn	12 893
Mamafubedu Public Library	Petrus Steyn	12 893
Tshame Public Library	Harrismith	2 868
Harrismith Public Library	Harrismith	27 869
Diyatalawa Dual Purpose	Harrismith	27 869
Morena Likhang Moloi Dual Purpose	Harrismith	27 869
RJR Masiea Children's Library	Phuthaditjhaba	54 661
RJR Masiea Public Library	Phuthaditjhaba	54 661
Ficksburg Public Library	Ficksburg	5 400
Clocolan Public Library	Clocolan	17 602
Hlohlolwane Public Library	Clocolan	17 602

(Source based on Statistics South Africa 2012)

Koontz and Gubbin (2010) have described the public libraries as providers of resources and services and that they offer a variety of literature to meet the needs of their communities. Hence, public libraries in Thabo Mofutsanyana District are aiming to serve all the citizens and communities in the district.

It is required of these libraries to comply with the National Norms and Standards for Public Library and Information Services which according to the South African Public Library and Information Services Bill (2012:3) are stated as:

- i. Public library and information services principles
- ii. National minimum norms and standards
- iii. Public library and information services to be open to public

Successful norms, standards and guidelines to be followed influence the library as an information intensive workplace:

- i. Services must encourage a culture of reading to create a nation of readers;
- ii. Services must be provided based on equal access for everyone;
- iii. Special measures must be taken to ensure equitable access to services, including measures to facilitate, promote and ensure access by people with disabilities and other categories of persons disadvantaged by unfair discrimination;
- iv. Services must be provided in a manner that is user friendly, accessible to the public and that comply with the basic values and principles governing public administration contemplated in section 195(1) of the Constitution of the Republic of South Africa 1996;
- v. Services must be provided in a manner that facilitates, promotes and develops the information literacy and electronic communication and technology skills of library users, particularly people with disabilities and young children;
- vi. Services must promote awareness of South African identity, South African emblems, cultural heritage, appreciation of the arts, scientific achievements, innovation, inter-cultural dialogue, cultural diversity and community history; and
- vii. Services must promote and advance South African publishing and writing.

Among these, Thabo Mofutsanyana District public libraries appear presently to be focusing on the physical conditions of integrated digital spaces and open access for the purpose of arranging information and knowledge to achieve shared and equality of access to meet the needs of their library users (Beagle et al 2006; Oteman et al 2014). The image and activities of information

services arising with emerging institutional changes have transformed the service delivery (Beagle et al 2006). In his study that focuses on the roles of libraries, Beagle et al (2006) indicated that libraries intended to shape and integrate physical facilities which have open access and services that will assist library users to navigate their spaces and be both technology-dependent and knowledge-intensive. Even though these libraries are innovatively intending to design workspaces and install physical network infrastructures that provide open access and wide range of resources, efforts have to be made to transform these concepts into the practical actualities in accordance with opinions of (Beagle et al 2006).

2.6 Mzansi Libraries On-line Country Grant

The collaboration between the National Library of South Africa, national Department of Arts and Culture and Provincial Library Services to tackle the LIS challenges of access to ICT services, Bill & Melinda Gates Foundation through Global Libraries Projects funded the South African public libraries pilot project. The project was named Mzansi Libraries On-line (Ralebipi-Simela 2015: 9). Ralebipi-Simela (2015: 9) has stated that the project was “intended to strengthen and enhance the community/public libraries through the provision of ICT equipment”. According to The National Library of South Africa Annual Report (2016/17:30):

Mzansi Libraries On-line is a project of the National Library of South Africa, aimed empowering South African communities by bridging the digital divide and providing free access to information and technology (National Library of South Africa Annual Report 2016/17: 30).

The programme was approved as a two years’ pilot project from 2014 until 2015, and it was hosted by the National Libraries of South Africa Library Services Association, Library & Information Association of South Africa and Department of Arts and Culture (National Library of South Africa Annual Report 2016/17). According to *Global Libraries Strategy Overview*, the goal of Bill & Melinda Gates Foundation that funded the Mzansi (South Africa) programme is:

... to improve the lives of 1 billion “information-poor” people by 2030 while positioning the world’s 320,000 public libraries as critical community assets and providers of information through relevant technologies (Bill & Melinda Gates Foundation 1999 – 2018 n.p.).

Twenty-seven pilot public libraries from nine South African provinces received a donation of computers, e-readers, games and tablets from the on-line pilot project to advance the impact and roles of the existing library services. They also received support for building and ICTs infrastructures (Matobako 2016). It was indicated by the Director of the Mzansi Libraries On-line that the project was aimed to empower all South African communities by aligning and supporting Africa Union Agenda of 2030 and National Development Plan through providing communities with open access, and on-line libraries with conducive and safe spaces (National Library of South Africa 2016). The success of Mzansi Libraries On-Line pilot project resulted into the rollout of the Mzansi Libraries On-line Country Grant which was launched in 2016 (National Library of South Africa 2016).

According to the Department of Arts and Culture (2015), funding from Conditional Grant is a constitutional mandate as stipulated in Schedule 5A of the Republic of South African Constitution, 1996: 138, that functional areas of Exclusive Provincial Legislative competence is to promote access to information within South African community and public libraries. All two spheres of South African government which are provincial and national are assigned to develop and or establish skills and library infrastructures within nine provinces that will be in the position to serve and achieve the information needs of their users (Department of Arts and Culture 2015). According to Department of Arts and Culture (2015), the public and community libraries in South Africa have improved their services through a number of initiatives:

- i. ICT infrastructure and free Internet access
- ii. Enhanced staff capacity and training
- iii. Building new libraries and library upgrades on the existing infrastructure (buildings)
- iv. Mobile library units
- v. Toy libraries
- vi. Mini libraries for the people with visual disabilities
- vii. Purchasing school text books and other library collections
- viii. Gaming equipment installed in libraries
- ix. Library automated systems
- x. Reading programmes and literacy campaigns

Mzansi Libraries On-line Country Grant targeted 667 public libraries within the country as part of the plan to enhance and strengthen technology into the diverse communities of South Africa (National Library of South Africa 2016). These public libraries received computers, tablets, games, training and development from Mzansi Libraries On-line Country Grant to improve the library services to meet the technological need of their communities, and to redesign the library space and existing services, develop librarians and provide free open access to their communities. Mzansi Libraries On-line Country Grant complements the Conditional Grant of the Community Library Services which was initiated by the Department of Arts and Culture in 2007 and aimed at, but not limited to: building more libraries, redesigning library, delivering mobile libraries buildings, procuring, equipping, container libraries, introducing dual-purposes libraries, expanding and strengthening ICT connectivity, and developing and implementing new provincial ICT systems (Department of Arts and Culture 2015).

The initiatives indicate that public libraries must know more about the information and technology needs of their communities. The Free State Provincial Library Service is mainly focusing on improving the physical technology infrastructures with the assistance of Mzansi Libraries-On-line Country Grant in their public libraries to achieve the needs of their diverse communities (Department of Arts and Culture 2015). Table 2.2 illustrates the distribution of ICTs equipment for ten selected public libraries of Thabo Mofutsanyana District procured and donated as part of the recipients on Mzansi Libraries On-line Country Grant (National Libraries of South Africa 2016).

Out of these 34 libraries in Thabo Mofutsanyana District, 10 public libraries were recipients of the Mzansi Libraries On-line Country Grant in 2016 (ProLib 2018). The libraries were Bohlokong, Moemaneng, Leratswana, FatengtseNtsho, Memel, Petsana, LS Sefatsa, Mashaeng, Meqheleng and Intabazwe. The Mzansi Libraries On-line project was funded by Bill & Melinda Gates Global Libraries Foundation through the facilitation of the National Library of South Africa (NLSA), Library and Information Association (LIASA) and the Department of Arts and Culture (DAC) in 2014 (National Library of South Africa 2014). The Global Libraries Foundation has benefited more than 30 countries in assisting to transform and upgrade their library services at international

level. Table 2.2 illustrates some of the ICTs benefits from the Mzansi Libraries On-line Counter Grant.

Table 2.2: Distribution of computers and tablets with internet access in the public libraries of Thabo Mofutsanyana District

Variables	Computers		Projectors	Online Games	Tablets
	Laptops	Desktops			
Bohlokong	1	12	1	Available	8
Moemaneng	1	4	1	None	1
Leratswana	1	24	1	Available	16
FatengtseNtsho	1	8	1	Available	5
Memel	1	22	1	Available	20
Petsana	1	7	1	Available	6
LS Sefatsa	1	6	1	Available	7
Mashaeng	1	12	1	Available	2
Meqheleng	1	4	1	None	None
Total	9	99	9		65

Regardless of the knowledge of benefits and services of the Mzansi Libraries On-line project, the former Deputy Minister Rejoice Mabudafhasi for Department of Arts and Culture (Department of Arts and Culture 2015 par.10) emphasized that:

“... this technology that we are delivering here today will indeed open the doors of learning and promote the culture of reading and sharing among Africans. The provision of computers with free internet access will indeed promote friendship, through subscriptions to social networks and will bridge the digital divide among Africans. The technology will enhance opportunities for learning and cultural exchange programmes. I have no doubt that membership in libraries will increase due to these resources” (Department of Arts and Culture 2015, par.10).

The introduction of information and communication technologies has influenced the activities of ten public libraries of Thabo Mofutsanyana District selected for this study, resulting in the availability and provision of wider range of services. The United Nations Educational, Scientific and Cultural Organization (UNESCO) has recognised and emphasised the necessity for libraries to integrate ICTs in their library services (UNESCO/IFLA 2000). UNESCO has also stated that the public libraries should view ICTs as a great opportunity that could bring a positive change in their roles and responsibilities as service delivery improvement (UNESCO/IFLA 2000). Obviously, there must be some conflicts in the operations of these public libraries as they were not

originally established communal spaces that had very strong digital technologies accoutrements aimed at providing a one-stop shop for diverse community members (Cornwall Council 2018).

Mzansi Libraries On-line Country Grant invested in the nine selected public libraries in Thabo Mofutsanyana District to ensure open access to information. Also, the provision of Mzansi Libraries On-line Country Grant services has contributed to bridge the digital gap in the Thabo Mofutsanyana District. There is consensus that there is an increasing demand by library users for free computers with Internet and other web-based services (Department of Arts and Culture 2015; National Libraries of South Africa 2016). The increasing demand of the new library services by library users has influenced the transformation of traditional library services to the emergence of knowledge commons within the public libraries of Thabo Mofutsanyana District.

2.7 Societal explanations to the emergence of the commons in South Africa

The social contradictions restrict access to natural and freely given resources and therefore constrain the growth and development of members of the community that are unable to afford the services of products. In another case, emphatically, it was the Second World War that introduced the problem of racial discrimination and human violation, especially in the South African communities. It was therefore during this period when South African government announced and introduced the ideology of apartheid regime in their country (South African History Online 2016). The South African society was wondering why government introduced this ideology which influenced the idea where one race is superior to another, meanwhile, the Ubuntu philosophy is collectivist and inclusive in approach, furthermore, it calls for human respect and dignity. Moreover, it expresses the value of cooperation and collaboration within the communities.

Because of the institutionalized practises of racism and discrimination in South Africa then, the matter was often reported to the United Nations gatherings who at the end initiated and orchestrated sanctioning and isolationism of the country into the international affairs (South African History Online 2016). In brief, Thompson (2000) further indicates that this regime officially lasted between the years of 1948 until 1994 when South Africa was declared a free democratic country where humanitarian and communitarianism were considered.

(a) The Ubuntu Linkage

The African philosophy of Ubuntu stands for a universal bond and it connects humanity, and fosters and strengthens the responsibility to share scholarly knowledge. The concept of Ubuntu is centred on the basis of the practice in Southern African where sharing and linkage among all humankind is like a religion (Borchi 2018). Scientists, science and society are interconnected, and the sharing of scholarly knowledge must be ensured to contribute to development and growth of research in the society in the interest human good. The interconnectedness invites attention to the point that the research undertaking can only be considered complete when the end product is in the hands of people. Hence it is important for it to be distributed widely. Open access to knowledge contributes to reversing the unidirectional flow of information from the global North to the global South. Open access has made it possible for knowledge produced in the global South to be available via ICT platforms to the global North, thus improving the visibility of knowledge from the South. In a very subtle way, open access will enhance protection and preservation of the local knowledge through being captured and digitized, and the made available and accessible to the global audience (Tise & Raju 2013).

It is generally acknowledged that commons relates to open society and open science, as defined by Karl Popper and later promoted by Georges Soros. The case of Russia already shows how open access movement could be supported by other traditions such as the socialist traditions. Here, in South Africa, the basis of the commons appears to be stronger and much deeper in the culture, practice and philosophy of African humanism, because the tenets of the commons aligns with the Ubuntu - the innate principle of sharing and a deep sense of interconnectedness that has generosity at its score.

Using the criteria of Ubuntu, the former head of Zambian government, Dr Kenneth Kaunda described the ideology as a social and humanistic philosophy that emphasize the humanism from the African perspective which influence the acceptable deeds and ideas in the continent (Mugubante & Nyanguru 2013). Furthermore, the study of Bolden (2014: 1) averred that the concept of Ubuntu was firmly presented in the post-apartheid South Africa as a framework to assist and guide the Truth and Reconciliation Commission that "...the injustices of the apartheid era from the perspective of both perpetrators and victims" Bolden (2014:1). Added to the

acknowledgement and respect of the ideology of Ubuntu, the Commission was trying to correct the disruptions caused by the apartheid region within the communities. In addressing the issues of human rights, post-colonial and post-apartheid leaders in South Africa such as Nelson Mandela, Desmond Tutu and Thabo Mbeki to mention the few, used 'Ubuntu as a concept guiding the idea of "Africa Renaissance" that urged to re-engage with African values of humanitarian' (Bolden 2014: 1).

Unquestionably, literature emphasized the fact that a philosophy that provides value to life and also influenced the emergence of 'personal and communal visions and missions,' in basic principles, is the good synthesis of Ubuntu (Broodryk 2006). Some scholars have described Ubuntu 'as a value that can makes the society respectfully share resources, and subsequently can eradicate corruption, poverty and many socio-economic challenges including environmental deprivation' (Mbhele 2015). According to Ngidi and Dorasamy (2014), the concept of Batho Pele translated in English as People First was introduced in order to promote responsibility, accountability and customer-friendliness within the public sectors. Absolutely, this idea was considered as one of the Ubuntu principles to improve open service delivery in a conducive environment.

This has been noted at a country level that the principles of Batho Pele entail customers to be consulted in a friendly manner, again, receive acceptable service standards which are transparent and accessible with courtesy and good treatment, followed by the rights to access information which is their constitutional rights, as stipulated in Promotion of Access to Information Act 2 of 2000 (Ngidi & Dorasamy 2014). It is therefore indicated that the principles of Batho Pele represent Ubuntu communalism and sharing of resources. This concept is used synonymously with the emergence of knowledge commons in public libraries as a public sector where community has the right to access information, knowledge and technology.

In the public libraries sphere, Ubuntu and communalism work interchangeably. According to Letseka (2000:183), the ideology of Ubuntu "illuminates the communal embeddedness and connectedness of a person to other persons and highlights the importance attached to people and to human relationships" (Letseka 2000:183). This implies that an individual belongs to the whole

and, in addition, community can develop and strengthen through the Ubuntu philosophy. At the burial ceremony of Nelson Mandela, the President of the United States Barack Obama in the course of giving his speech referred to an African word that, according to him, encapsulates the life and time of Mandela. He said:

“There is a word in South Africa –Ubuntu- a word that captures Mandela's greatest gift: his recognition that we are all bound together in ways that are invisible to the eye; that there is a oneness to humanity; that we achieve ourselves by sharing ourselves with others, and caring for those around us” (Obama 2013:19).

The word Ubuntu means “humanity to others”. The more popular meaning is “I am what I am because of who we all are” (Ricard 2012:3). Ubuntu depicts that “your pain is my pain, my wealth is your wealth, your salvation is my salvation” (Ricard 2012:3). Through our humanity, we are all intertwined. Ubuntu depicts humans as interdependent. “We are who and what we are because of who we all are” (Obama 2013:19). The African culture is very diverse but it is basically a community based one, and has been celebrated as promoter of mutuality and connectedness for many centuries. Ubuntu connects to the popular saying that no man is an island. Man performs best when he collaborates with others. Jooste (2015:16) said, “believe that a person is a person through other persons” Jooste (2015:16). David Cameron, the Prime Minister of Britain between 2010 and 2016 captured the spirit of the Ubuntu when he said:

It's time we admitted that there's more to life than money, and it's time we focused not just on GDP, but on GWB - general well-being, ... Well-being can't be measured by money or traded in markets. It's about the beauty of our surroundings, the quality of our culture and, above all, the strength of our relationships... Improving our society's sense of well-being is, I believe, the central political challenge of our times (Cameron 2011, par. 4,5).

The essence of Ubuntu is clearly exemplified in the popular story of Amy Biehl. Amy was a talented lady, and she graduated from Stanford University in the USA. She had an extensive work experience in different continents of the world. She was the winner of the 1993 Fulbright scholarship which she dedicated to the establishment of a multiracial and multicultural democracy in South Africa. She was also an active member of the ANC. Amy was killed in an act of political mob violence in Gugulethu, a town outside of Cape Town in South Africa on the 25th of August 1993 (Showme 2008/9). Four young men were arrested and tried, and sentenced to 18 years imprisonment. However, in honour of Amy's values for peace and reconciliation, and in the spirit

of Ubuntu, the parents of Amy supported a grant of amnesty to the four convicted killers (Showme 2008/9). As at today, two of those four young men namely NtobekoPeni and Easy Nofemela are staff of the Amy Biehl Foundation set up to address the challenges of violence in South Africa.

The spirit of Ubuntu does not condone violence or outright disregard of the law. Rather it is one that responds to violence as social reality, and instead of returning violence for violence or hatred, Ubuntu stretches out the hand for forgiveness, love and sharing. In the same manner, open access seeks to stretch out hands in the information sphere to share instead of keeping what could be mutually useful to humanity.

“The authors share a belief that we can no longer afford to tackle these intractable problems in isolation from one another. All efforts are needed. All examples add something to our understanding. The making of this book had already stimulated unusual collaboration in research and our hope is that it will further the process of bringing about better communication across disciplines and between theoreticians and practitioners” (Hess & Ostrom 2007:6).

2.8 Synthesis of the chapter

This chapter has introduced the context of the study, including the historical context of public libraries and Thabo Mofutsanyana District municipality. The chapter commenced by discussing Thabo Mofutsanyana public libraries. This chapter proceeded by outlining Mzansi libraries On-Line Country Grant with the focus on nine Thabo Mofutsanyana District public libraries and finally, the societal explanations to the emergence of the commons in South Africa and the concept of Ubuntu. On this foundation, the next chapter looks at the conceptual and theoretical clarification of the study.

CHAPTER THREE

CONCEPTUAL AND THEORETICAL CLARIFICATION

3.1 Introduction

In Chapter Two, the historical background of public libraries and legislative and institutional frameworks that govern the libraries were presented. This chapter also described the historical context of the Thabo Mofutsanyana District Municipality as well as the public libraries that are located in the municipality. Also, some attention was paid to the role of the Mzansi Libraries Online Country Grant Project in view of its influence in the expansion of ICTs and ICT training in the libraries in the area of study. Finally, the Chapter connected vital societal explanations to the emergence of the commons in South Africa.

In this Chapter, the study presents the major concepts/theories and frameworks that guided the research, a crucial aspect of literature. Furthermore, the literature review was conducted to guide the researcher in respect of theories and concepts relevant to the study, and their applications, methods used in doing related researches, and the research groups that are germane to the other studies in respect of the current one (Marshall & Rossman 2015; Phillips & Pugh 2005; Randolph 2009). The development and use of theories enable the analyst to specify which elements of a framework are particularly relevant to particular questions and to make general working assumptions about the shape and strength of these elements. Theories make assumptions that are necessary for an analyst to diagnose a specific phenomenon, explain its processes, and predict outcomes (Ostrom 2011).

Since this study was latched on concepts and frameworks that are relatively recent in the field of library and information science, the researcher chose to undertake a relatively detailed review. Evidently, knowledge commons is still in its infancy stages (Hess & Ostrom 2007), and, in fact, traceable to the 1990s. Its expansion is generally accepted to coincident on the expansion of information technologies (Bollier 2002). The concept of emergence is even more nascent, having not been found used to study or describe transformations taking place in the library although it has

featured in communications (Chouka &Theophanidis 2016), IT and information science (Jaclin & Theophanidis 2016). First, a brief presentation of the concept of the commons was made, and then expounded. Thereafter, the IAD framework which guided the study was presented. Then emergence was conceptualised, giving attention to its emergence and the framework for modelling emergence. An attempt was made to link the knowledge commons with emergence, comparing the characteristics and features Hess and Ostrom (2007), while finally, the review was synthesized. A choice on the bent of the concepts that guided the study was presented and justified.

3.2 The meaning of commons

The word commons is derived from *common*, a popular English word; it therefore becomes very necessary to define common, and then derive the meaning of commons from there. Lexico (2020, par.1) defines common, first, as an adjective, meaning “occurring, found, or done often; prevalent” Lexico (2020, par.1), and, “shared by, coming from, or done by two or more people, groups, or things” Lexico (2020, par.1). As a noun, (CrossWord 2017, par.1) in Google, rather starts by supplying an example “... a piece of open land for public use” (CrossWord 2017, par.1).

Hess and Ostrom’s (2007:4-5) definition of commons tallies with Google’s namely, those resources that are shared by the global community, a group of communities or a community. According to them, commons encompasses “the free gifts of nature such as air, oceans and wildlife as well as shared social creations such as libraries, public spaces, scientific research and creative works (Hess & Ostrom’s 2007:4-5). The commons is regarded as shared wealth without which people cannot thrive or survive. Figure 3.3 shows the social relations that tie the community and resources to the commons.

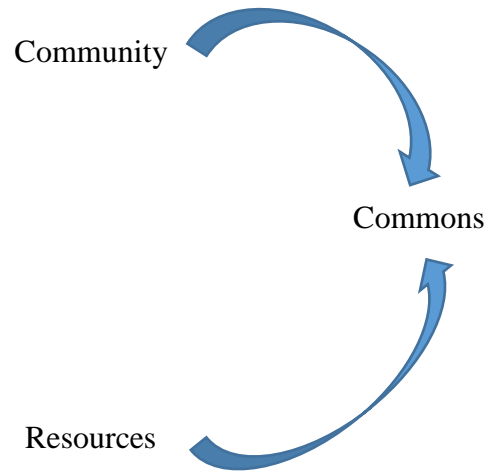


Figure 3.3: Locating the commons

(Source based on Broumas 2017: 1509)

Commons has further been described by Hess and Ostrom (2007:4-5) as shared resources:

“...which are co-owned and/or co-governed by its users and/or stakeholder communities, according to its rules and norms. It’s a combination of a ‘thing’, an activity, and commoning as the maintenance and co-production of that resource, and a mode of governance” (Hess & Ostrom 2007, p.4-5).

Commons is further defined as:

“...resources can be small and serve a tiny group (the family refrigerator), it can be community-level (sidewalks, playgrounds, libraries, and so on), or it can extend to international and global levels (deep seas, the atmosphere, the Internet, and scientific knowledge). The commons can be well bounded (a community park or library); trans-boundary (the Internet); or without clear boundaries (knowledge, the ozone layer)” (Tepper 2018: 4).

From Hess and Ostrom’s definition, commons could be viewed from global and community levels. At the global level, Rowe (2001) has enumerated the gifts of nature that could be considered as commons, and “... they include the atmosphere and oceans, languages and cultures, the stores of human knowledge and wisdom, the informal support systems of community, the peace and quiet that we crave” (Rowe 2001:7), and “the genetic building blocks of life” (Rowe 2001:7). At the community level, the library, school, playground, markets, etc. have been identified as shared commons (Hess & Ostrom 2007). Commons has also now been largely viewed as a philosophy in

which it refers to “basic institutional arrangement that involves a group of people and forms part of management or governance of community resources” (Frischmann et al 2014: 2), without necessarily signifying however, it does not signify the resources.

3.2.1 Foundations of the commons

The foundation of the commons can be illustrated with the work of Aristotle, the Greek philosopher and other sources. Aristotle said over 2 300 years ago that “Man is a social animal. He who lives without a society is either a beast or a God” (Odin 1996: 421). Humans exist as a result of combined efforts of humans. No man is an island, we need each other. According to Ola (2019:2),

“The wise book teaches that two are better than one, because they have a good reward for their labour, that how good and pleasant it is for brethren to dwell together in unity and that Iron sharpens Iron. It is in sharing, giving, caring and helping that life finds its true expression, meaning and fulfilment” (Ola 2019:2).

It is aptly captured by Frankl (2006:99) in his book *Man’s Search for Meaning* that, “Ultimately, man should not ask what the meaning of his life is, but rather he must recognise that it is he who is asked” (Frankl 2006:99). According to him, life is not about “me” it is not about “you” it is about “us”. Aristotle advocates that humans should not live just for themselves but that they should live for the common good. Speaking of the common good is recognising that there are numerous other goals in life that are also very proper pursue beyond their own private benefits.

“Responsible people look for opportunities to contribute to worthy causes and to improve society however possible, even when the benefits of this progress will go primarily to others.... Everyone has an obligation to promote the common good by making whatever contributions are necessary to improve the lives of all” (Massaro 2011:8)

This obligation may not be enforceable by the law but it is a social responsibility that all well-meaning individuals must strive to attain. This obligation must be focused on working and planning for the community as a whole and not just for a limited class or few.

3.2.2 Commons versus private and public/state forms of managing resources

In today's life, all attention is focused on the global economy, hence, the society recognise the difference between the public goods and private goods (Quilligan 2012). Furthermore, Quilligan (2012) indicates that to understand the growing agreement that is better among others, laws and institutions and policies are needed. Nonetheless, the study affirmed that nobody is assured of them; hence, an accurate epistemology has to be embraced globally during the evaluation and approval of new solutions for global economic and socio-ecological coordination. Therefore, the government will have to construct a democratically restricted economic system that people will clearly understand (Quilligan 2012). Sharing of resources has to be based. It is therefore important to understand that the shared resources that society manage by negotiating their own rules through practices, norms, social and customary traditions, create a challenge because they are often blurred, and they have to recognize the difference between the commons/common goods and public goods (Hess & Ostrom 2007; Quilligan 2012).

Nipun (2019, par. 2) broadly describes that goods or services that can be expended concurrently by the society without excluding one and for which consumption is non-rival are pure public goods, whereas, services or goods that "consumption is rival and from which customers can be excluded, are private goods". The difference between these two world's basic forms of collective property is essential. Evidently, public goods are different from private goods. Conversely, Kotchen's study also affirmed that the definition of these two terms is not the same yet pivotal. Public goods are defined in contrast to private goods, in which by definition, they are both rival and some non-rival but excludable. His study made an example of a well-known proverbial which says there is 'no free lunch', and his study further provided an example which states that "a sandwich is a private goods because one person's consumption clearly diminishes its value for someone else, and sandwiches are typically excludable to all individuals not willing to pay" (Kotchen 2012: 1). The Pennsylvania State University (2018) have described non-rivalrous as the consumption/use of the goods or services by one person does not reduce the availability or utility of the goods or services to another person (these goods are often, but not limited to intangibles). Kotchen's example of non-rivalrous indicates that "one person's enjoyment of a good does not diminish the ability of other people to enjoy the same good" (Kotchen 2012: 1).

According to Ostrom and Ostrom (1977), cited in Hess and Ostrom (2007), commons are considered as common goods which benefits the community as whole, in contrast to private goods that benefits individuals. In addition, they defined common goods as a concept which consist of two dimensions, in this case, rivalry and exclusivity. Their study further revealed that rivalry is a situation in which consumers have the same access within the same class of common goods, however, one consumer reduces the units of consumption for all other users. Whereas in exclusivity, the consumer is excluded from consuming goods. There is a need to understand that libraries are considered as common goods which is owned by the entire community instead of individuals and in this case, it becomes vulnerable which may lead to direct threats of been overuse (Hess & Ostrom 2007). Table 3.1 illustrates the differences between common pool of resources, toll or club goods, and public and private goods (Hess & Ostrom 2007: 9).

Table 3.1: Types of goods

Exclusion	Rivalry		
	Low		High
	Difficult	Public goods Useful knowledge Air	Common-pool resources Libraries Forests
	Easy	Toll or club goods Journal subscriptions Day-care centres	Private goods Personal computers Doughnuts

(Source based on V. Ostrom & E. Ostrom 1977)

It was in this context that the study was designed to examine the emergence of knowledge commons in nine selected Thabo Mofutsanyana District public libraries in order to understand the implant delivery of digital services to the entire community.

3.2.3 Legal regimes that govern the commons

There are many ways of categorising the legal regimes that govern the commons. But the categorisation of commons as a resource or resource system or open access resources, and,

commons as a property-rights regime is most appropriate in this review (Ciriacy-Wantrup & Bishop 1975).

I. Commons as a resource or resource systems

Hess and Ostrom (2007) revealed that shared resources and resource systems that constitute common-pool resources exist. Certain commons resources are common pool-resources; they could be natural or manmade; a typical example of manmade common resource is the public library, stream or school which could be owned by a community, corporation or other. Other typical examples include the pool of human knowledge, public library, market, and the stream, among others. Others include shared natural resources such as wildlife, forests, fisheries and water (Dedeurwaerdere et al 2014). Hence, Elcome (1998:4) describes natural resources as "... all the natural commodities and features of the earth's physical environment that are exploited by the human population". He further indicates that they provide human needs and satisfy their wants, because they support a particular life-style or standard of living, however, they are not necessary for people's survival.

For a material or characteristic to become a resource, it means people find it desirable or useful, therefore, access to such resources is often restricted to members of the community, students, staff and researchers. They are also known as open access resources. These goods are types of economic goods, but they are generally independent of particular property rights. Digital commons is a typical open resources that tend to be generally free and deals with a collectively created and owned knowledge and information within a community of people (Morell 2010). However, it is subject to property right because the same community of people can interfere and rule the interaction processes of their shared resources to third parties. Ciriacy-Wantrup and Bishop (1975) have posited that nobody has legal right to exclude others in open access regimes. However, outcome of overuse or over exploitation may occur, thus the tragedy of commons may ensue.

II. Commons as a property-rights regime

Common property regimes provide members with a clear defined legal right that regulates the access to common pool resources and eliminate non-members from accessing and using those resources (Ciriacy-Wantrup & Bishop 1975; Rose 1991). The term property rights have been

questioned in almost all uses in the sense that it mobilises the rights of weaker socio-economic groups to access certain natural resources. In her study, Ostrom (1999) posited that property rights are enforceable authority for the purpose of undertaking specific actions in some specific domains. For instance, from a political perspective, urban commons testifies that a diverse group of people or political parties are competing to control or claim the use of commons such as property, land, public spaces, etc, in their community. It is attested in the publication of 'Ancient Law' by Henry Summer Maine in 1861 who debated the origin of the concept of property in ancient times (Hess & Ostrom 2003). According to Hess and Ostrom (2003: 115) Henry Summer Maine asserts that, "... joint ownership by families and groups of kin (in other words, common property) was more likely the initial property regime in most parts of the world than the notion of property owned by a single individual private property". This argument has been ongoing for many years, and it is not yet fully resolved whether common property comes first, or whether it was individuals that introduced the difference in opinions between historians and social scientists (Hess & Ostrom 2003).

The principle of common property regime regulates the utilization, protection and maintenance of common-pool resources (Hara, Turner, Haller & Matose 2009). In essence, common property regimes govern the commons by providing members access to common pool resources and eliminate non-members from accessing and using those resources (Ciriacy-Wantrup & Bishop 1975; Rose 1991). The term 'property' describes goods, exceptionally reinforces the impression that goods share these attributes surely tend everywhere to share the same property regime. According to Feeny, Berkes, McCay and Acheson (1990); Ostrom (1999), common pool-resources are utilized as open access resources which are used by anyone who can gain access. Before discussing common property regimes, common property can be defined as a natural resource unit that is only sustainable when managed by the common property rights (Hess & Ostrom 2003). Social scientists have also debated about the significance of permitting access to multiple individuals or organizations to cooperatively use a single resource system.

Furthermore, the debate was later initiated by the articles of H. Scott Gordon (1954) and Anthony Scott (1955) who outlined the fact that when many fishermen harvest a high demand fish without any limit on the amount which any fisher could take, the quantity of fish harvested would exceed

the maximum suitable yield and the maximum economic yield (Hess & Ostrom 2003). Hence, it was assumed that individuals, government or single organization would have a long-term commitment towards the protection of the resources. In addition, it was noted that the common pool-resources are vulnerable of been overuse, polluted, and have the potential to cause destruction unless limits are developed, enclosed and enforced. In many instances, it is apparent that the arrangement to transfer the property rights from the user groups to others to access the incentives, it converts owner protectors to neglect resources they intended to protect (Hess & Ostrom 2003).

Despite these factors, economists had a different opinion; they view common-property institutions having a longer history as compared to private-property institutions, and also consider private-property to be a crucial element due to the incentives related property relationships in the development of economic because of the incentives related (Hess & Ostrom 2003).

3.3 Knowledge as commons resources

In this thesis, knowledge refers to all types of information, ideas and understanding one gains through experience or through studies, whether they are indigenous, scholarly, scientific, or non-academic or non-formal. Information and knowledge are socially managed as common-pool resources because they have the properties of non-excludability and non-subtractability (Broumas 2017). Knowledge also includes creative works such as the visual and creative arts as well as music. Knowledge has dual functions in nature namely as a commodity and as a constitutive force of the society (Reichman & Franklin 1999). It is both a basic human need and an economic good, and this suggests that the nature of this resource is very complex. When one acquires or discovers knowledge, such knowledge can be considered to be both a social process and, or a personal acquisition (Polanyi 1958). Furthermore, human knowledge is cumulative.

Interestingly, the literature reviewed indicated that there is a limited research carried out to examine the emergence of knowledge commons in the South African public libraries' context (Nwagwu & Matobako 2021). However, before discussing the concept of knowledge commons, it is good to observe that the study of Bauwens, Kostakis, Troncoso and Utratel (2017) have indicated that there are many types of knowledge commons and that very little is known about them.

According to their study, Sung and Hepworth (2013) have raised vital questions about the knowledge commons: (i) how do such commons work? (ii) where do they come from, (iii) what contributes to their durability and effectiveness, and (iv) what undermines them? Their study further elaborated that many scholars in various disciplines studied types of commons paradigms to answer the above questions and begun case studies, however, their studies focused only on specific cases and never examined the broader institutional question and acknowledge the need for systemic analysis (Bauwens et al 2017). It is therefore important to understand that these scholars measured a limited number of descriptive. A definition of knowledge commons has been provided earlier in the study. There are many ways of perceiving of knowledge commons:

- (i) Knowledge commons as a space/environment,
- (ii) Knowledge commons as resource systems, and
- (iii) Knowledge commons as a model and philosophy.

(i) Knowledge commons as a space/environment

One of the ways of perceiving knowledge commons is that it is a new type of library facility, a space in the library. It is a technology rich space in the library where library users can access information and associated materials in diverse formats, engage in individual and collaborative work Nwagwu and Matobako (2021), and for synthesizing and sharing of their knowledge (Loertscher, Koechlin & Zwan 2008). The space commonly includes a large number of computer workstations that provide access to productivity software as well as the internet and electronic library resources (White, Beatty & Warren 2005).

(ii) Knowledge commons as collective ownership of information resources

Knowledge commons also refers to content, data, idea and information that collectively owned and managed by a community of users, and the medium is the internet. It is a knowledge space that goes beyond the traditional library space concept and practice aimed at sustaining and transforming the knowledge acquisition experience from the library contexts, and providing an integrated work environment for academics through information technologies that support learning, sharing and collaboration in a largely self-service oriented manner (Nwagwu & Matobako 2021).

(iii) Knowledge commons as a philosophy

Finally, knowledge commons refers to an approach or philosophy for governing the management and/or production of human knowledge (Nwagwu & Matobako 2021). Knowledge commons provides a way not only of responding to the challenges posed by various enclosures that restrict access to knowledge, but also of building fundamental democratic knowledge institutions and societies (Nwagwu & Matobako 2021).

(iv) Sharing: A social responsibility

Sharing knowledge can be the difference between living and dying to people at certain critical points in time. For one to accessing an article that freely downloadable, or accessing some open educational resources to assist in a class assignment could be the difference between succeeding and failing in the examination. Also, access to public sector information has been proved to have the tendencies for promoting good governance, responsibility and accountability. Knowledge sharing is akin to development. Man has the unique privilege that other living beings lack namely knowledge creation, storage and dissemination. Knowledge sharing should be viewed as a social responsibility – more so that knowledge is power. The Holy Bible stresses the importance of knowledge by telling us that people are destroyed for lack of knowledge (Bradley 2018, par.1).

Knowledge is the key to the requisite know-how human beings need, and access to that knowledge is very essential to knowledge acquisition, human capacity and performance. Swartz (2008, par.5) captured this social responsibility concisely in the Guerrilla open access manifesto when he said, “Those with access to these resources students, librarians, scientists - you have been given a privilege. You get to feed at this banquet of knowledge while the rest of the world is locked out. But you need not - indeed, morally, you cannot keep this privilege for yourselves. You have a duty to share it with the world” (Swartz 2008, par.5). This is probably what was behind the minds of those that gathered at the Bethesda in the USA meeting when they said:

“Our organizations sponsor and nurture scientific research to promote the creation and dissemination of new ideas and knowledge for the public benefit. This mission is only half completed if the work is not made as widely available and as useful to society as possible...We adopt these policies in the expectation that the publishers of scientific works share our desire to

maximize public benefit from scientific knowledge and will view these new policies as they are intended an opportunity to work together for the benefit of the scientific community and the public” (Brown et al 2003, par.1).

The Budapest open access initiative meeting also provided some insightful knowledge when it provided one of the objectives of open access movement to be the provision of a platform that would enable the sharing of the knowledge of the rich with the poor on one hand and the poor with the rich on the other (Budapest Open Access Initiative 2012, par.3). The interesting part of achieving this social obligation for sharing knowledge is the justification it provides for the idea/expression dichotomy, and it achieves this by reinforcing that ideas are supposed to be expressed for sharing.

“We human beings have a great need for one another...Our great task is to rethink our understandings of community so that we can move from the closed protectionism of current forms to an openness and embrace of the planetary community...This cooperation is spawned from a fundamental recognition that nothing can exist without the other, that it is only in relationship that one can be fully one’s self. The instinct of community is everywhere in life. It has now been repeatedly demonstrated that making publications OA by self-archiving them in an OA dramatically enhances their research impact” (Wheatley & Kellner-Rogers 1998, par.1).

3.4 Public libraries as knowledge commons resource systems

The bulk of the research on commons has been focussed on natural resource commons, with attention addressed to man-made resources having been on the increase since 1995. However, irrespective of the focus, Hess and Ostrom (2007) have posited that “... the essential questions for any commons analysis are equity, efficiency, and sustainability” (Hess & Ostrom 2007:6).

“Equity refers to issues of just or equal appropriation from, and contribution to, the maintenance of a resource. Efficiency deals with optimal production, management, and use of the resource. Sustainability looks at outcomes over the long term. Many studies hone in on issues of property-rights regimes and the various challenges of common property. Indeed, the important distinctions between the terms “common property” and “common-pool resource” grew out of this scholarship” (Hess & Ostrom 2007:6).

Much of the efforts and projects on knowledge commons focus on scholarly research and academic libraries. Although some of the academic activities obtaining in academic libraries do not obtain public library, but it should be pointed out that the idea that information is a resource that should

be shared predates the literate societies. Hence knowledge commons is not an affair of academic libraries only. In their review Kranich and Schement (2008) have recounted how from the prehistoric times, people relied on using stories, songs and folklores to share commonly held knowledge. As a matter of fact, it was the advent of writing that introduced various forms of fixing of ideas in texts and the major motif was to give the ideas some form of portability across space and time. All commercial transactions and religious beliefs, history, literature, and poetry were recorded and kept in great libraries, for example the library in Alexandria, Egypt. According to Kranich and Schement (2008: 8):

“Not until the mid-fifteenth century invention of the printing press, and the subsequent emergence of capitalism in Europe did texts become things—the first commodities to be bought and sold by means of an information market. From the time of the Enlightenment, English speakers began to think of information as though it were a thing, and acted accordingly—by passing laws to enclose information to prevent theft and by constructing systems to deposit or retrieve information” (Kranich & Schement 2008:8)

Shillinglaw and Thomas (1988), in their study explain public library as a local resource of information and documents which are made accessible to the whole members of a community. International Federation of Library Associations (2010) has described public libraries as the providers of resources and services, and that they offer a variety of literature to meet the needs of the citizens and inhabitants of the community. The effectiveness and efficiency of the public library as a facility that promotes reading, learning and researching can be assessed by success in giving users required information that meet their needs. Public libraries have begun to assimilate the roles of the internet and Web 2.0 applications; library users have new powers and abilities that facilitate independent access to information (Watstein & Mitchell 2006).

Libraries are inclusive and offer universal services, and they encourage public participation and deliberation. Kranich (2003) elaborated further that libraries in the digital age throughout the world serve the communities as information commons in the public sphere to promote well-being, global understanding, advancement of learning, information literacy, digital inclusion, and public participation in the democratic process (Kranich 2001). In many libraries around the world, a dynamic and innovative concept was birthed in the 1990s, information commons, which provided libraries with opportunities for library development (Shuhuai, Sheng, Lin & Cao 2009).

Information commons is an information developing service model which refers in this study to the sharing of information by a community of consumers or produces. The phrase information commons, applies to phrases like knowledge commons, digital commons, electronic commons and internet commons. For the sake of this study, information commons is used interchangeable with knowledge commons. Information commons focuses on content that evolves with the target and changing objects, and the integration of access to resources and services offered to its users (Matatiele 2020). While, knowledge commons promote equity of access to information, bridging gaps in opportunities to participate in the digital age, ensuring that no one is left behind.

Literature shows that South African public libraries are the local hub of information, making all kinds of knowledge and information readily available to their community. The diversity of services offered by these public libraries are provided on the basis of equality of access for all, regardless of socio-demographic and socio-economic status (Kranich 2001). Studies indicate that public libraries exist to be utilised by their communities, however, the manner in which they are used or expected, have change drastically due to the new technology explosion and technological needs of their users. Evidently, Mzansi Libraries Online Country Grant in South Africa championed by Bill & Melinda Gates through Global Libraries Programmes reinforced the ICT applications of ten selected Thabo Mofutsanyana public libraries. The role of public libraries who were the recipients of ICTs has been revolutionised by the rapid advances in information technologies (Kranich 2001).

3.5 Tragedy of the knowledge commons

Knowledge commons cannot be viewed as a saintly solution to human knowledge challenges. The inference can be drawn from Hardin's *Tragedy of the commons*. Hardin (1968) imagined a common pasture that is open to several herdsmen. Hardin's insight was that herdsmen do not share resources they hold in common except with some of gains from the pasture for their animals with as little cost as possible. As described by Hardin, there was an evolution in the nature of the shared resources, and that this evolution brought has new demands and needs (Hardin 1968). Just as there were too many animals for the village commons, so too, there were new categories of demands and needs that threaten to overwhelm the traditional public library and undermine its effectiveness (Twine 2009). This vision of networked access to digital information has come to pass, and now

library users needed more than open-access. They require skilled support professionals to teach them the skills to access and use digital forms of information in an environment designed to support information gathering and production technologies (Twine 2009).

The traditional libraries and their operations appear to be in conflict with what could be considered the best interest of the society. Librarians have however long recognized that access to the digital commons has the remarkable potential to counteract factors that divide the rich and the poor (Twine 2009). As Morell (2010) described digital commons, it is an information and knowledge resources that is collectively created and owned or shared between or among a community and that tend to be non-excludable, that is, to be available to third parties. Thus, they are oriented to favour use and reuse, rather than to be exchanged as a commodity. Additionally, the community of people that build them can also participate in the governing of their interactions processes and shared resources.

On the other hand, a library visitor may expand his or her research content, or focus through interactions with other library users or officials created in the commons. With increasing low cost of IT devices, access the information is easy. While access to the commons is free, the financial cost of access to the commons is an obstacle to people to use this unique resource (Twine 2009).

There are many factors that interfere with access to property owned by the commons. Hotte and Stanley (2000) have shown how trade converts common goods to private goods. Copeland and Taylor (2003) show further that when the prices of common goods are low, open access can persist, but that open access suffers tremendous setback when the prices of commons property soar above the capacity of the commons to buy. In this regard, the capacity of the state, the level of technology development and growth in resources play significant roles.

3.6 Modelling knowledge commons - the Institutional Analysis and Development Framework

In this section, the IAD framework developed by Ostrom is presented. The framework is presented, first in its original form and purpose for modelling commons, and then its deployment in the study of knowledge commons. The IAD framework is a tool that can be used for diagnosis for

investigating any subjects that people repeatedly interact based rules and norms that discipline their choices of behaviours. The framework has been developed by commons scholars to facilitate the comparative analysis of institutions (Nowlin 2011). It is regarded as the only major policy theory that deals with the institutions. Broadly defined, institutions are “the prescriptions that humans use to organize all forms of repetitive and structured interactions.” (Ostrom 2005:3). They are the formal and informal rules that are understood and used by a community and establish the ‘working do's and don'ts’ for community members (Hess & Ostrom 2007). The framework is broadly located within new institutionalism, where the importance of culture and symbolism is given much greater emphasis in institutional analysis than that found in ‘old institutional’ analyses of organisations and behaviours, which focus only on political and economic factors (Ostrom 2010).

The IAD framework provides a methodological lens that is dynamic. On one level, it can be understood as a checklist of “those independent variables that a researcher should keep in plain sight to explain individual and group behaviour” (Gibson 2005: 229). However, the framework also structures the checklist into a “causal schema while allowing great flexibility in the determination of exactly what factors should be included” (Gibson 2005: 229). Consequently, while the IAD framework was initially developed out of the need to structure investigations into natural resource commons, the framework is flexible enough for application across a wide variety of situations, from banking reform in the United States to forest management by First Nations peoples in Canada (Polski 2003; Smith 2001). It has increasingly been adapted and used for the study of a variety of knowledge commons. Examples include studies of bio-knowledge systems, such as genetic resources Schmietow (2012), the development of the international open-source software commons Schweik and English (2012) and digital research repositories Ghosh and Kumar (2007), the evolution of racialised demographic data in population censuses (Fosu 2001).

In the process of applying the IAD framework to knowledge commons, scholars have recognised the need to adapt the framework since the intangible dimensions of knowledge commons seem to play a more central role than in conventional natural resource commons. The first formulation of the framework in the context of knowledge commons was developed by a multidisciplinary meeting of scholars during the ‘Workshop on Scholarly Communication as a commons’ in 2004

and formalised by (Hess & Ostrom 2007). Empirical and theoretical applications of this formulation were largely limited to digital commons. The second formulation was developed by a collaboration of three legal scholars, and sought to broaden the scope from digital commons to include multiple forms of intellectual pooling under the rubric of the 'cultural commons' (Madison et al 2010). This was subsequently refined on the basis of 11 case studies from multiple disciplinary perspectives (Frischmann et al 2014). Intellectual and cultural commons are mainly focused on human activity. In other words, this is related to concepts that are related to social structures which are prone to dynamic change. The concepts are linked to intellectual commons in terms of knowledge and intake of information, distribution, production, communication, taking into consideration that commons may comprise both tangible and intangible commonification resources. Therefore, cultural commons also do matter because they connect with creativity and culture which plays a significant role in the environment, social, and economic development around the life of a community and their expectations. Hence, from the cultural point of view, culture commons are composed from social life and human creativity, through the interconnectedness between the different social groups within the communities.

Hess and Ostrom (2007) provide the first formulation of the IAD framework in the context of the knowledge commons. This formulation retains the basic structure of the framework, but modifies its individual elements. The framework is structured around three broad clusters of variables that are taken to be the basic underlying factors affecting institutional design and the patterns of interaction within a community or organisation.

As indicated in Figure 3.1, the left-hand side describes the underlying situation: the resource characteristics, the make-up of the community and the rules that they use. The action arena describes how specific participants cooperate or do not cooperate with each other given the underlying situation. The combination of the action arena and the underlying situation results in various patterns of interaction with specific outcomes, which can then be assessed using evaluative criteria.

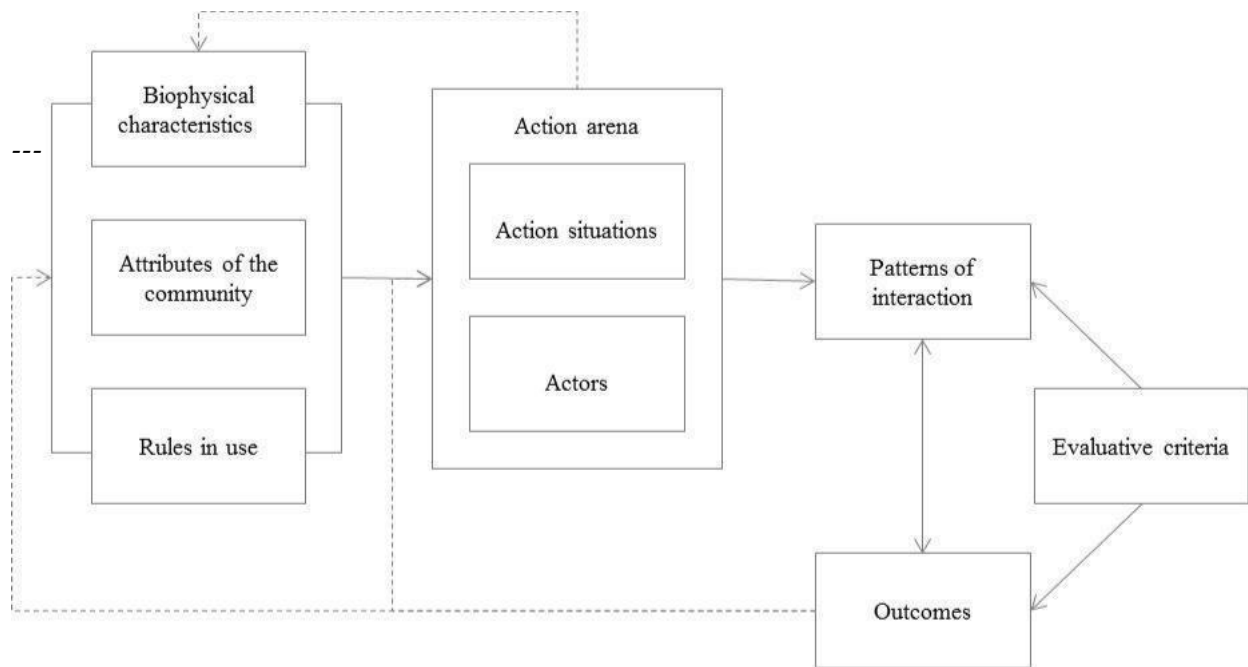


Figure 3.1: The original Institutional Analysis and Development Framework (Source based on Hess & Ostrom 2007: 44)

As Hess and Ostrom (2007) illustrated it on Figure 3.1, the biophysical characteristics of a knowledge commons are composed of three distinctive elements: (1) artefacts, which are the discrete, observable, nameable representation of ideas, such as articles, books and web pages; (2) facilities that store artefacts and make them available, such as libraries and the physical network infrastructure; and (3) ideas, which are the intangible content contained in artefacts.

The community is in turn composed of individuals who can take on different functions, as users, providers or policymakers. Depending on the nature of the commons, different community members may play some or all of these roles. Thus, for instance, members of open software collectives typically play all three roles; in contrast, only some users of open access journals may act as contributors, and the administration of these journals is typically limited to a small number of people. The values of these members, and the extent to which they are shared, substantially affects the ways in which they interact with each other and the resulting outcomes. As an example, Hess and Ostrom (2007) explain that universities which pursue close ties of corporate sponsorship may be the site of conflicting values, in which some members value commercial interests and others value public interests.

The rules-in-use, or institutions, are normative instructions about what participants are allowed to do in a particular action situation, and are backed by a minimal sanctioning ability for non-compliance. These rules may be written down or simply widely known among the community. In contrast, rules-in-form are those that are merely written down, but are not known or enforced. Rules-in-use are in turn composed of three types of rules: (1) operational rules for making day-to-day decisions; (2) collective choice rules, where individuals interact to decide the operational rules; and (3) constitutional rules, which define who may participate in making collective choices. For Hess and Ostrom (2007), the most significant set of rules-in-use in the context of knowledge commons is intellectual property rights (IPR), which define right of access to the commons, and contribute to the commons, extract, borrow or remove items and content from the commons, participate in managing the commons and in excluding others from accessing the commons, and selling or leasing content from the commons.

The action arena focuses on the incentives facing diverse participants, and the ways in which this can affect their choices to cooperate or not cooperate with one another. Thus, for instance, Hess and Ostrom (2007) note that although universities are increasingly introducing institutional incentives for scholars to contribute to university repositories, the low level of participation in open archiving suggests that there are problems with these incentives: they may be unknown, untrusted, or too complex, or they may be insufficiently strong to outweigh countervailing habits.

The patterns of interaction emanating from an action arena in turn reflect the underlying situation as a whole and the incentives structuring the action arena. There are many different ways in which individuals may interact. For instance, they may conflict with each other or cooperate; they may commit to sustained interaction with each other or opt out of doing so; their interactions may be intentional or unfocused.

The outcome of these interactions may then be judged using a number of different evaluative criteria. Hess and Ostrom (2007) identify a number of frequently used criteria: (1) increasing the amount and quality of scientific knowledge; (2) maintaining the sustainability and preservation of the commons; (3) building standards that lead to high levels of participation in the commons; (4) ensuring the economic efficiency of the commons; (5) applying fair standards in the sense that all

individuals benefit equally from their contributions; (6) working towards equality in the commons by redistributing resources to poorer individuals (Nwagwu & Matobako 2021). However, as discussed in the conceptual framework, the empirical literature on commons suggests that sustainable commons typically require high levels of participation in the commons, which in part requires that participants judge the rules of the commons to be fair. Moreover, for commons to persist over the long term they would typically need to be cost-effective. As such, there are arguably three central criteria in their analyses: (1) commons that are sustainable, (2) commons that increase the amount of high-quality scholarship, and (3) commons that are equal. For Hess and Ostrom (2007), it seems that much of the ability of a commons to meet these three criteria comes down to the extent to which commons is able to navigate and counter IP rights successfully, in the sense that they threaten the commons with enclosure and thereby pose the problems of instability in the commons, degradation of its epistemic goods, and inequality in access to the commons.

The formulation of the IAD framework by Frischmann et al (2014) and Madison et al (2010) departs from Hess and Ostrom' (2007) underlying schema in four regards. First, they treat the underlying situation of a knowledge commons as a socially-constructed one; consequently, the patterns of interaction emanating from a knowledge common can go on to shape the underlying situation and action arena. Thus, while the IAD framework typically approaches the underlying situation of natural resource commons as exogenous or externally fixed, this formulation in the context of knowledge commons treats the underlying situation as endogenous. However, as Hess and Ostrom (2007) note, "For longer-term analyses, feedback from the outcomes of interactions tends to change these 'temporarily' exogenous variables". And, when one is analysing a rapidly evolving system with changes occurring at multiple levels relatively rapidly, these feedback loops are very important" p.68. Since members of knowledge commons can contribute to its intellectual resources relatively more quickly than members of a natural resource commons are capable of changing an ecological system, this formulation makes this caveat explicit and central to the analysis.

Second, they collapse the distinction between patterns of interaction and outcomes, arguing that certain interaction patterns emanating from the action arena are themselves outcomes. How people

interact with the rules, resources, and each other is an outcome that is linked with and influential to the form and content of the knowledge, or informational output from the commons (Madison et al 2010: 682). As an illustration of this point, they explain that in an open-source software project, the open-source development is collaborative; the programme itself, and the open-source software license and other governance mechanisms are mutual.

Third, they include elements that examine the objectives and the history of the commons. In doing so, they aim to expand what they call a ‘functionalist’ approach to institutional analysis to include a more metaphorical or narrative approach. Although they do not explicitly define the term, by ‘functionalism’ they seem to mean an approach that examines complex systems in terms of the function of their constituent parts, including its rules, actors, and patterns of interaction. They contrast this with an approach that examines complex systems in expressive terms, by “...looking to the construction and evolution of meaning in the system as reflected in symbol and narrative” (Madison et al 2010:673).

Fourth, they deliberately leave the evaluative criteria underspecified. In the context of natural resource commons, sustainability is a widely-accepted goal since these commons are faced with increasingly degraded and unstable ecosystems. In contrast, they argue, the evaluative criteria for knowledge commons are likely to be much more contested. As Cole (2007) points out, this is likely in part because knowledge commons are not threatened with over-use, but are instead at risk of being under-used as a consequence of fragmented and complex IP rights. Related to this, the enormous growth in the production of epistemic goods – and bads – poses new risks, such as the problem of pollution or spam. More deeply, however, Frischmann et al (2014) argue that knowledge commons emerge in response to a number of different problems, so that the evaluative criteria for judging the outcomes of a knowledge commons are a function, at least in part, of the problem that the commons was constructed to address.

Although the authors do not provide an updated schema that illustrates these revisions, Figure 3.2 indicates what the revised framework would plausibly look like:

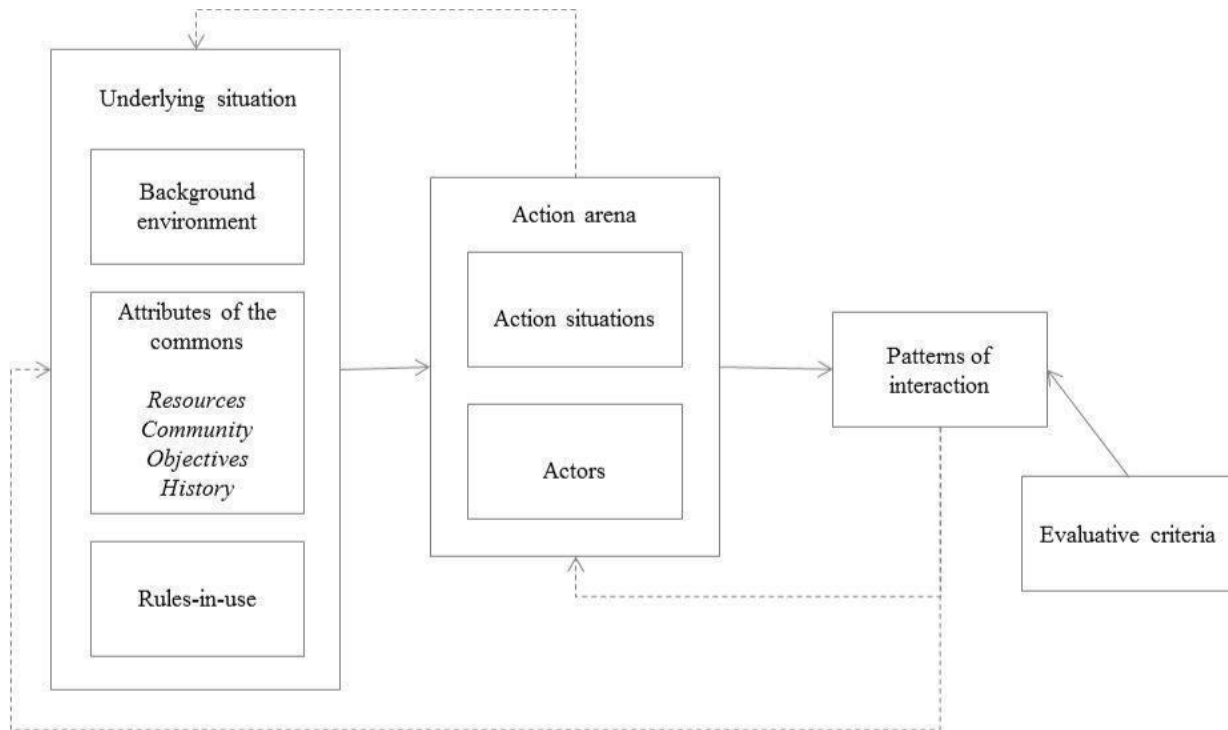


Figure 3.2: The Institutional Analysis and Development framework as applied to knowledge commons
(Source based on Frischmann et al 2014; Madison et al 2010)

This formulation of the framework shows how moving from natural resource commons to knowledge commons involves a change in methodological approach. Studies of natural resource commons typically focus on one element of the IAD framework, depending on the subject of interest. Hess and Ostrom (2007: 44–45) use this approach in examining knowledge commons:

“Entering the analysis with the physical/technical and institutional characteristics is most appropriate when one is trying to understand the nature of the resource being shared ... The action arena, often at the heart of the analysis, is particularly useful in analysing specific problems or dilemmas in processes of institutional change. Within knowledge commons, it is an appropriate place to start when trying to think through the challenges of creating a new form of commons such as a new digital repository within an organization. Beginning with the outcomes makes sense with questions such as why and how information is being enclosed. Why do authors not voluntarily contribute to a repository?” (Hess & Ostrom 2007:44–45).

However, one of the consequences of viewing a knowledge common as largely constructed is that the causal story ceases to be linear: the underlying situation, the action arena and the patterns of interaction may all influence each other. This means that the boundaries between each part of the

framework are more porous and fluid than is the case when applying the framework to natural resource commons. Viewed in this way, it may be more useful to analyse knowledge commons as a whole, by looking at the relationship between all three areas in the framework. Thus, as Frischmann et al (2014: 20) point out, the enquiry is likely to be an iterative one, in which learning “more about goals and objectives is likely to result in the identification of additional shared resources, understanding the makeup of the community will lead to new questions about general governance, and so forth”.

Since Frischmann et al (2014) and Madison et al (2010) are concerned with developing a structure for the comparative study of knowledge commons; they use the framework to generate buckets of potentially useful questions that can guide case studies of knowledge commons. These buckets of questions are intended to be useful in two ways: as a guide in planning interviews with actors in the commons, and as a framework for organising and analysing the information gained from interviews and document reviews. As with Hess and Ostrom (2007), these questions are largely structured in terms of the relevance or irrelevance of IPR. As I argued in the previous chapter, this framing arises from a strong focus on northern knowledge commons and the ways in which complex and expensive IPR can act as a form of over-fencing in the knowledge commons.

3.6.1 Adapting the IAD framework for knowledge commons in an unequal world

When adapting this framework to the context of southern knowledge commons, a different form of over-fencing may be more relevant: that arising from systemic inequality which is institutionalised in the form of skewed standards of scholastic excellence. In addition, inequality can exist both outside and inside the commons. It is therefore useful to consider how the IAD framework can be adapted to generate questions that address external and internal inequalities.

Table 3 sets out a detailed specification of the IAD framework as it might apply to knowledge commons that arise in the context of inequality. The first column sets out each element of the IAD framework as specified by Frischmann et al (2014). The second column outlines the questions that could guide a case study of the knowledge commons in the context of IP rights. This combines issues raised in the first formulation of the framework Hess and Ostrom (2007) with its second

formulation Madison et al (2010) and subsequent refinement (Frischmann et al 2014). The third column indicates how the buckets of questions could be usefully adapted to studying knowledge commons that arise in the context of inequality. It is important to note that this framing is tentative, and just one way of thinking about southern knowledge commons. Indeed, as Frischmann et al (2014) stress, the framework is a fundamentally provisional one, and is subject to being refined and reworked on the basis of empirical studies.

This formulation of the framework in the context of inequality introduces several changes. In the first place, it nuances the questions to deal with inequality outside and inside of the commons. In the case of external inequality, for example, while earlier formulations ask how the boundaries of the commons is shaped by IPR, this formulation asks how the boundaries of the commons is shaped by skewed standards of excellence with regard to language, style, intellectual tradition and intended audience. In the case of internal inequality, for instance, while earlier formulations ask how access to the commons is determined by IPR, this formulation asks how access is shaped by vectors of inequality, such as race, class, gender and nationality.

More deeply, however, this formulation introduces three major conceptual changes. First, this formulation considers scholastic standards of excellence as a key institutional feature of the commons. In doing so, it broadens the conceptualisation of governance to include epistemic institutions. Since the main distinguishing feature between knowledge commons and natural resource commons is the central role that epistemic goods play in knowledge commons, the inclusion of epistemic institutions is arguably critical to examining knowledge commons. Second, this formulation brings into focus the interplay between inequality outside the commons and inequality within the commons, by considering how internal inequalities shape the capacity of the community to craft standards of excellence that differ from the skewed standards underlying the systemic inequality between southern and northern scholarship.

Third, this formulation introduces three evaluative criteria for judging the flourishing of commons that emerge in response to inequality: (1) the extent of collaboration within the commons; (2) the extent to which research is connected and cumulative; and (3) the extent to which the commons is able to renew itself over generations. These criteria are based on the view that systemic inequality

theoretically constitutes a form of over-fencing. In the conceptual framework, the researcher developed the argument that the skewed standards of excellence underlying systemic inequality discourage collaboration between members of a subordinate group. This leads to fragmented and non-cumulative scholarship. In so far as members of the subordinate group cannot participate in modifying these standards, they are liable to grow disenchanted and eventually opt out of the commons, so that the commons become unstable and fragile. As such, systemic inequality can impede the growth of high-quality scholarship among members of a subordinate group, and endanger the sustainability of their commons.

Consequently, this formulation identifies an analytical relationship between the three evaluative criteria that Hess and Ostrom (2007) use to judge whether a commons is flourishing – sustainability, quality and equality – where sustainability and quality are in part a function of equality. This suggests that not only are the evaluative criteria for judging a knowledge common dependent on the problem that the commons was constructed to address, but that a detailed specification of the evaluative criteria requires careful empirical and theoretical buttressing. As a consequence, this formulation of the framework deliberately leaves the costs and risks of the outcomes emanating from the commons underspecified. The aim here is to use the empirical study to cast light on the potential costs and risk of a knowledge commons that emerges in response to inequality.

While this formulation in the context of inequality is clearly different from formulations in the context of IPR, all these formulations share several key characteristics that are a function of the underlying framework. First, the framework focuses on the way in which the collective action of individuals can influence the underlying situation of the commons. In order to understand processes of institutional change in knowledge commons, it is therefore useful to examine the relationship between all three areas of the IAD framework, where this is likely to be an iterative process. Secondly, and related to this, the framework emphasises that a community can create intellectual goods and institutions that shape their underlying situation, even as this situation contours the commons as a whole. This confluence of ideas and material political and economic factors is therefore central to the shape and function of a knowledge commons.

Thirdly, the framework draws attention to contestations over meaning and institutions as a way of excavating the normative foundations of the commons. Thus, for instance, Madison et al (2010) explain that conflicts in the narrative of an organisation illustrate debates over purpose and thereby illuminate the normative foundations of the commons that are reflected in the values and beliefs of participants in the organisation, and in the formal and informal rules of the organisation that shape participants' practice. The formulation of the framework in terms of inequality in particular emphasised the way in which such contestations may reflect the dynamics of inequality within the commons.

In sum, the IAD framework provides a consistent language for structuring a case study of a knowledge commons. It allows one to specify carefully-delineated and theoretically-connected research questions, which are situated within a causal schema and nested within a broader institutional setting. This is useful for getting an analytic handle on knowledge commons that operate at many levels of complexity, and provides a framework for conducting comparative research on commons. In this section, the researcher adapted the framework for comparative research on knowledge commons that arise in response to the problem of inequality, which are most visibly located in the global South. This formulation provides the following guidelines for investigating a southern knowledge commons: (1) that the enquiry examine the confluence of ideas and material factors in shaping the commons, particularly its epistemic institutions; (2) that it analyse the interplay between inequality outside and inside the commons; (3) that the outcomes for evaluating the commons should be identified in terms of the problems that inequality theoretically generates – fragmented and non-cumulative knowledge systems that are unstable and fragile; (4) that it focus on the commons as a whole, by investigating the relationship between all three areas in the framework in an iterative manner. What follows is an examination of the concept of emergence, and later linked with the knowledge commons.

3.7 The concept of emergence

In this subsection, the researcher consciously re-presented a flurry of definitions ranging from the popular to those from scholars across time and discipline to highlight the conceptual meaning of emergence.

3.7.1 Building up the concepts from everyday use

In everyday language, emergence means “‘bringing to light,” “appearance”, or “showing up” where there was absence, unclarity, darkness or nothing previously”. Jaclin and Theofanidis (2016) presented an etymological synthesis of emergence:

“To emerge:

To move out of or away from something and become visible;

(Of an insect or other invertebrate) to break out from an egg or a cocoon;

To become apparent or prominent;

(Of facts) to become known;

To recover from or survive a difficult situation.” (Jaclin &Theofanidis 2016:283)

Emergence has also been used in its everyday sense to describe, for instance, the changes that are taking place in the society due to the application of ICT, or leadership and others. It has also been used as a synonym for use, embrace, acceptance, as in ‘onset’ as in Emergent Information Technologies and Enabling Policies for Counter-Terrorism (Yen & Popp 2006:1); Emergence of the Information Technology Discipline, etc (Gowan & Reichgelt 2010). It is also in the same sense that the 2017 edition of the African Network for Economics of Learning, Innovation and Competence Building Systems (Africalics), a regional arm of Globelics, had the ‘Emergence of Innovation for sustainable African Development’ (Nwagwu 2017). Kranich and Schement (2008: 8) have used the word ‘emergence’ in its everyday sense to describe the birth and development of the internet:

“The emergence of the Internet and the World Wide Web stimulated a growing awareness among scholars of the value of information, and intensified the study of information as a common property or shared resource” (Kranich & Schement 2008:24).

In addition, emergence has been used to refer to events that repeat periodically, for instance, the emergence of new moon or events that may occur once in the lifetime or some epidemics. It is also used to describe development and appearance of new technologies, for instance, the WWW, e-readers; in biology, to describe the development and growth of teeth in a baby, or in agriculture, for sprouting of seeds from the soil, among others. It is used to describe events that occur in conservation biology Beier (1993), wildlife management McCarthy and Destefano (2011),

predator-prey dynamics Lewis and Murray (1993) to epidemiology (Kenkre, Giuggioli, Abramson & Camel 2007). Emerging issues could be likened to a:

“...possible new technology, a potential public policy issue, or a new concept or idea that, while perhaps fringe thinking today, could mature and develop into a critical mainstream issue in the future or become a major trend in its own right (Lum 2016:7).

Examples of emerging issues:

“... include autonomous corporations that have software and robots instead of human management or staff, the emergence of digital bodyguards for children to combat cyber bullying, and the dismantling/transformation of traditional education institutions as the Millennial generation takes leadership positions” (Lum 2016:7).

In trends researchers look for important changes and collect data at certain points; in emergence situations may be described as they appear in different or the same scenario.

“Emerging issues analysis has no such clear facts and Figures. Instead, it tries to see things that are barely visible. Its sources are crazy people, marginal people, off-beat publications and websites, in the recesses of the mind of some scientist or engineer. The concern of some artist or poet, or unpublished novelist. Emerging issues analysis, in contrast, focuses on things just as they are emerging – as close to their very first notice as possible; certainly, before they become a well - established "trend," and never as a commonplace “problem”” (Nigg et al 2012:22).

The word, *emergence*, could be used to address new things that are important, or that may become important in the future. In fact, often, emerging issues are used to describe events that are not yet mature; they are still unfolding, or in the lab somewhere. At a high level of abstraction, usually researchers identify emergence as ‘weak signals’, and the issues that are mature are regarded as ‘data points’. Sometimes, there may be very few data points, but they may be so compelling that researchers decide to start tracking their development (Nigg et al 2012:22):

“Emergence is concerned with issues that might have not been noticed by most people, but some researchers might have made observations about the events. Hence, what seemed science fiction in the 1980s may move up to prominence and approach the mainstream” (Nigg et al 2012:22).

3.7.2 Trend versus Emergence

Often, trends and emergence are used together as though they are about a single thing. Practically however, they are two key and distinct building blocks of foresight work. Strictly speaking, a trend is a historical change over time. A trend describes history. Trends speak about changes that are being measured, which means there is normally quantitative data points on which basis we extrapolate into the future based a trend line in a graph. Trend is one of the keys ‘building blocks’ which are used by futurists when they are forecasting alternative futures.

3.7.3 Emergence as a scientific concept

In the Editorial of Issue 3 Vol. 55 of *Social Science Information* in 2016, Jaclin and Theofanidis (2016) presented the first attempt at formally introducing emergence into the information science field, despite many references to emergence latching on information, information systems and IT, and other (Jaclin & Theofanidis 2016). Kerne et al (2008: 462) described emergence from systems perspective as:

“... qualities that come newly into existence typically as a result of novel combinations of elements even if the elementary elements are not novel” (Kerne et al 2008: 462).

Among other things, emergence has been used by different theorists and emergentists to explicate evolutionary process as emergent phenomenon (Corning 2002). Lewes (1875: 369) used emergence specifically to differentiate a kind of causation that is not the simple result of an addition:

“The emergent is unlike its component in so far as these are incommensurable, and it cannot be reduced either to their sum or their difference. But, on the other hand, it is like its components, or, more strictly speaking, it is these” (Lewis 1875: 369).

Ellis (2008) has described emergent reality in which he postulated how physical effects can occur due to the forces of non-physical quantities such as information and goals. As a phenomenon concerned with complex systems, the first key to handling is the examination of hierarchical physical structuring and functioning of the various components. This will involve the combination

of bottom-up and top-down actions in the hierarchy of the structure. Another major key in the emergence of complex systems is the role of hierarchically structured information in setting goals via feedback control systems. The development of complexity in complex systems involve evolutionary processes acting over very long time periods and developmental processes that act over much shorter times. The rules or laws generate the complexity, and the ever-changing flux of patterns that follows leads to perpetual novelty and emergence. Emergence, in the sense used here, only occurs when the activities of the parts do not simply sum up to give the behaviour of the whole. That is, emergent phenomena only occur when the whole is indeed more than a sum of its parts. Emergent phenomena also occur in domains for which we presently have few agreed upon rules: ethical systems, the evolution of nations, and the spread of ideas come to mind.

Emergence is a common feature of complex adaptive systems - ant colonies, networks of neurons, the immune system, the Internet, and the global economy, to name a few - where the behaviour of the whole is much more complex than the behaviour of its parts. There may also be other valid scientific uses for the term 'emergence', but the rule-governed domain is rich enough to keep us fully engaged. Many deep questions about the human condition and society depend upon understanding the emergent properties of complex adaptive systems: How do living systems emerge from the laws of physics and chemistry? In the field of library and information studies, how does the concept of the commons emanate and thrive in an infrastructure like the library which already has rules that guide its operations? Although this study is not about how emergence occurs in information field, we will take a further but appropriate examination of this question in the course of the study.

3.7.4 Why emergence as a scientific concept?

The questions: Why is emergence embraced in spite of its opaqueness, need to be addressed in order to fruitfully apply it to social science research? (Alexander et al 2012). Emergence is about change. We live in a world that is characterised by constant change. Changes such as climate change, political change, social change, and others are replete in global social and economic life. Scrutinized in labs, streets, skies, depths or even screens, change intrigues, scares, fascinates, saves and kills. People are changing, societies are changing, and so do technologies and continents,

forests, oceans and species. Whatever man knows as reality and its (dis)content also changes, and so do research and researchers change both in their belief and approaches to problem solving. Change and its conceptions rely only on preconceived or post-confirmed logics, and most studies about change occur either about before or after the change. The processes of generation that occurs in between entities, amid human and non-human forms, among institutions, machines or practices that are not only transformed by their relational entanglements but are actually emerging from them are rarely studied. Change is a crucial notion and site of investigation that is hardly problematized, particularly in the social sciences.

Jaclin and Theofanidis (2016) aver that the concept of emergence offers us alternative ways to understand the origins of change and the conditions of possibility for change to occur, and what change means and how we can conceive of the generative abilities of change. Does ‘change’ – or its semantic companions, ‘novelty’, ‘innovation’, ‘shift’, ‘transformation’ extend beyond the usual conceptual framework of ‘causality’, and if so, in what ways? The concept of emergence enables us to understand how institutions form and change, and it is of great importance to many areas of ecology (Holland 1995). In his most recent book, *Emergence: From Chaos to Order*, John Holland (1998) has probed further into the theory of emergence, as an essential property of complex adaptive systems, discussing both examples of emergence, and proposing a methodology for modelling emergence. Holland has posited that emergence, despite its ubiquity and importance, is an enigmatic, recondite topic, more wondered at than analysed.

Though the broad nature of the conspecific processes underlying institutional change are well documented, quantifying how institutions emerge from the movements and social interactions remain largely unexplored in the case of knowledge commons in the Free State in South Africa. Perhaps the greatest complicating factor is determining how events taking place at relatively small, temporal, and spatial scales, give rise to the phenomena of extended and overly patterns. How does the initiation of ICT acquisition skill for library staff, and the possession of similar skill by library users, for instance connect to the overarching changes that are observed in the libraries?

Philosophy offers us a higher order justification for examining emergence. A major motivation for emergence theory is the quest for the discovery of genuinely novel properties in nature. How

appropriate are our understanding of whole from their component parts? From the field of information science and technology, to what extent do efforts to understand technology use, for instance, represent the whole of the issues that are involved in human choices, adoption and use of technologies? Evidently however, viewing emergence as irreducible to lower-level phenomena does presuppose that reality can be divided into a number of distinct levels or orders. If phenomena can be considered as whole, and so studied, it should be called to mind also that, in terms of their relations to the universe, phenomena are complementary and constitute elements of the global whole (Dupré 1993; Harre & Madden 1975).

Every emergent property is therefore a component of a super property – this view is often considered Aristotelian (Clayton & Davies 2008). It follows that one of the major issues for emergence theory will involve the question: when exactly should one speak of the emergence of a new issue within the natural order (Clayton & Davies 2008). Related to the idea of downward causation or whole-part influence, O'Connor (1994) has shown that downward causation is the most distinctive feature of strong emergence, and it is also its greatest challenge. Hence, despite Clayton and Davies's (2008) opinions to the contrary, an emergent structure or object can be analyzed in terms of micro-physical causes, and this has been the scientific practice.

The earliest conceptual references come from the field of philosophy where it has been suggested that emergence supplies an alternative way of refuting explanatory reductionism - that is, the dominant practice of explaining all phenomena in the natural world in terms of the objects and laws of physics (Clayton & Davies 2008). Reductionism however goes beyond physics to encompass all efforts aimed at explaining a whole based on the understanding of component parts. Reductionism can be generically illustrated by the question: Can one understand the characteristics of an ant colony by studying a member ant in the colony? Definitely the response will be no, but one can examine collaboration and cooperation of the ants to build the colony, and secure it to serve their needs for shelter.

Despite persistent questioning of the appropriateness of reductionist approaches in science, reductionism remains a credo in modern science, and scholars in much of knowledge fields will continue to endeavor to explain phenomena in terms of their constituent parts – so called unity of

science. However, the emergentist argument has great potentials for deepening our understanding about how best science can be done and how scientific outputs which result from teasing of results obtained components taken from a whole should be interpreted. By implication, emergentist philosophy has a great potential for strengthening our approaches and the quest itself to understand the society in which we live. While reductionism will persist, an emergentist philosophy will inevitably have some effects on how scientists undertake science and very importantly how they view and apply their results.

3.7.5 Emergence - systems theory and complexity

The concept of emergence is borrowed from science and systems theories, and it offers an alternative to grasping not only the origins of change and the conditions of possibility for change to occur, but also what change takes and how its generative abilities can be conceived. Here, one could be prompted to ask whether ‘change’ – or its semantic companions, ‘novelty’, ‘innovation’, ‘shift’, ‘transformation’ – could be extended beyond the usual conceptual framework of ‘causality’. If so, in what ways? In this particular era when issues around climate, social and political, even other changes are occurring, one could be eager to situate this crucial notion and investigation site in the social sciences. Change can be scrutinized in laboratory, on the streets, in the skies, in the depths and even on screens, change is intriguing, scaring, fascinating and killing. People are changing, societies are changing, and technologies too, just continents do, the forests, oceans and the species, are all changing. What is reality and its content or discontent change, and so do research and researchers. Change may be followed, accepted or refused, but it cannot be ignored. When conceptions of such changes are based on preconceived logics, or post-confirmed logics and events, it is an indicator that change is either about to come, or has already past.

While attention has been paid to the distinction of strong and weak emergence, the focus of most recent studies has been on weak emergence. In 2000, Ian Beeson examined *Emergence and Accomplishment in Organizational Change* (Beeson & Davis 2000). According to him, systems theories place emphasis on the maintenance of order and they therefore have generally given an inadequate account of change. Viewing emergence as a complexity theory, they suggested that this theory provides an explanation of nonlinear systems which makes

change fundamental and strikes a better balance between order and disorder. They outlined a theory of change management which they united a generalized notion of emergence in complex systems with a notion of accomplishment in human action. Their analysis on the case progressed with the introduction of a new fingerprint identification system into police forces in England and Wales.

Viewing organizational change from the perspective of emergence has resulted from the inability of the system approach, an integrative model which harmonized the jungle of ideas that had characterized management thought Inegbenebor (2005), cited in Osifo and Omoregbe 2011:52, but it does not fully take into note the organizational environment which is comprised of a set of relationships between agents or stakeholders and other factors that may be beyond the control of the organization Mason (2007), cited in Osifo and Omoregbe 2011:52 . Authors have suggested that to better understand organizational and management change the opportunities that are presented by emergence would have to be explored. Globalization and competition within the environment are increasing and also intensifying the markets of competition (Cao & McHugh 2005), and also hindered by the instability and corruption of government policies found in many African countries. Thus, there are relationships between agents or stakeholders and other factors that are beyond the control of the organization and yet the organization has to strive to survive and thrive. Hence the systems theory is increasingly questioned (Amagoh 2008; Byeon 2005; Ferlie 2007; Pettigrew, Woodman & Cameron 2001; White 2000).

Researchers tend to describe systems as a self-organizing or continuously evolving into something new, when viewing change from the complexity paradigm (Byeon 2005; Ferlie 2007; White 2000). Styhre (2002) suggested that to better understand the fluid and disruptive process of organizational change that has to be an integration of systems theories and complexity. Emergence arises from the resort to complexity of systems as an alternative to better understanding of systems. Complexity is concerned with the measure of diversity or heterogeneity in environmental and internal factors in an organization such as customers, departments, socio-politics, suppliers and technology (Mason 2007).

Complexity theory is concerned with how parts at a micro-level in a complex system affect the behavior and overall outcome at the macro-level McElroy (2000); McKenzie and James (2004), or weak emergence. Complex systems therefore concerned birth emergent order which arise from what could otherwise be considered as very disorderly systems (Sherif 2006). Evidently, increase in complexity of a system diminishes the ability to understand and use information to plan and predict (Osifo & Omoregbe 2011).

The mechanical ontological models are rejected by the complexity of the theory paradigm which assume linear causality between effects and events (Styhre 2002). According to Kim and Rhee (2014), due to the interactions among the different parts that form the complex system it's pattern can be characterized as behavioral and structural. The complex system goes through various phases that have outcomes that effect how the system operates. It tends to be deterministic in nature. Its internal and external environments and it forms a new relationship through a phase of instability (McElroy 2000). Systems that operate or exist near a state of instability will tend to exhibit creativity and then produce new behaviors that touches the whole system (Price 2004; Styhre 2002).

3.8 History and origin of the concept of emergence

There is a relative consensus among scholars that the term *emergence* was first introduced by George Henry Lewis in 1875 (Holland 1998). However, there are epithets of the concept which can be traced far back to the time of Aristotle. It was Aristotle who posited the principle that growth within organisms was responsible for the all the qualities or forms that later emerge in the later stages of the organism. Without any doubts, modern biological sciences, including medicine and agriculture are based on this fact. For example, the care a fetus receives in the womb shows up in its later stages of life, and down to birth and maturity (Holland 1998). Known as the principle of entelechy, the adult form of the human or animal emerges out of its youthful form but there are formal and final causes internal and external to the organism, and they are all connected. Another precursor to the Lewis opinion about emergence can be traced to emanation developed by Plotinus in the 3rd century. Emanation models allow for a gradual process of becoming; it allows for the emanation of new species as well (Holland 1998).

Scholars have also referred to the works of Hegel as a major source of the emergence theory (Inglis & Thorpe 2012). According to the Hegelian system, at some point ideas would give rise to the natural world, and the two are re-integrable. Hegelian perspective gave rise to the philosophies of processes, and temporalization of ontology (Clayton & Davies 2008). A variety of ‘philosophies of processes emerged after Hegel and others shared Hegel’s commitment to the ‘temporalization of ontology’ that construes reality as fundamental in process. For instance, Henri Bergson, William James, and Alfred North Whitehead (Nayak and Chia 2011) all have recreated the emergence of more complex objects, structures, institutions, forms of experience, and cultural ideas - the world emerges from the subject and the subject emerges from the world.

Fast-forward to the birth of sociology, and of course the birth of social sciences generally, in the 19th century which is very closely tied to the Hegelian and other scholarship. The so-called father of sociology August Comte provided a ladder of the evolution (Stewart & Zaaiman 2014). Comte and his followers such as Emile Durkheim postulated that higher-order human ideas arose out of simpler antecedents, and this has helped to establish what could be regarded as an emergentist understanding of human society (Stewart & Zaaiman 2014). Thereafter, when researchers carry out studies of the human society, they do not necessarily need to begin with the realm of ideas or Platonic forms but they begin with the elementary processes of the physical and social worlds.

3.9 Emergence in Library and Information Science

There is something strikingly inviting about the new interest in the study and applications of the concept of emergence since the 1990s when the concept re-emerged. The idea of re-emergence arises due to the long period of time during which the concept has been in limbo after its earliest postulation by Lewis in 1875 (Holland 1998). This re-emergence must be connected to the rise in the role and significance of information in modern society, and the rapid development in information technologies and their applications. However, right from its history, “information”, and “technology” and their Monika have co-occurred. Researchers have said that the work of Hegel is a major source of the emergence theory, and Hegel pointed out that ideas were responsible for the natural world, and that the two are re-integrable (Stewart & Zaaiman 2014).

3.10 Modelling emergence

There are two streams of nested evidence about how to model emergence. The first emanates from the viewpoint that emergence is a process that cannot be described by a fixed model, because it consists of invariant distinctions. As a result, emergence must be described by a meta-model, that is, a model that represents the transition from one model to another one. Heylighen (1991) summarized the concern of this school when he stated:

“How can something fundamentally new be expressed in a known framework? Such fundamentally novel phenomena which cannot be reduced to a mere combination of known things are traditionally called “emergent”” (Heylighen 1991: 1).

In “Complexity and Information: Measuring Emergence, Self-organization, and Homeostasis at Multiple Scales”, Gershenson and Fernandez (2012:1) adopted information theory approach to model emergence. Their interest was on the information produced by a system, and not necessarily how self-organizing systems such as knowledge commons unfold and grow, imposing disruptive mechanisms on existing systems. Although their viewpoint about emergence as information at a higher scale that is not present at a lower scale is valid in our study, this study focuses on how institutions that arise from emergence adjust to changes to enable the institution continue to perform its functions in the society.

The second stream represents those that posit that emergence can be modelled as nonlinear process, using existing multivariate statistical models. Szparaga and Kocira (2018) have posited that mathematical processes of biological growth or population models could be used to model agriculture and forestry. They suggested that analytical solutions could be achieved using generalized logistic equation, also known as generalized logistic functions. They went ahead to use the model to determine whether generalized logistic functions may be used to predict the emergence of winter rapeseed after its seed treatment with plant extracts from *Taraxacum officinale* roots under controlled environment conditions. The same process was used by Burkhardt and Tomé to model forest trees and stands and by Koya and Goshu (2013) to examine biological growth. Hu and Lo (2007:2) applied logistic regression “... to model urban growth in the Atlanta Metropolitan Area of Georgia in a GIS environment and to discover the relationship between urban

growth and the driving forces” while Gan, Stibbe and Njue modelled emergence rate of spring wheat using the same approach. Aside of biology and agriculture, Guastello (2007:5), has used nonlinear modelling to examine “... non-linear dynamical systems concepts of attractors, bifurcations, and self-organization culminate into a swallowtail catastrophe model for the leadership emergence process”.

3.11 Synthesis of the chapter

In this chapter, concepts/theories were discussed. An in-depth meaning and foundation of commons were presented. Furthermore, the chapter presented types of goods, and legal regimes that govern the commons. Moreover, types of commons and knowledge as a resource. Followed by a description of knowledge commons as a concept and public libraries as knowledge commons resources system. Another important aspect covered by this chapter was an issue of *Tragedy of the commons*, then modelling knowledge commons using IAD framework, and the adaptation were provided. In conclusion, the chapter discussed the concept and modelling of emergence. The next chapter reviews empirical literature.

CHAPTER FOUR

REVIEW OF EMPIRICAL LITERATURE

4.1 Introduction

In the previous chapter, the thesis expounded the concepts and theories that guided the study, spelling out clear how the theories connected to the objectives of the research. The concepts and theories discussed included commons, the IAD framework and the emergence. The approach adopted in presenting the concepts included specifying the extent of depth, direction and bent as well as justification of the choices for the study.

Bless et al (2013: 49) describe a literature review as a process of finding and assessing literature that relates to the topic in order to sharpen and deepen the theoretical framework of the research. Machi and McEvoy (2009: 4) define a literature review as "...a written document that presents a logically argued case founded on a comprehensive understanding of the current state of knowledge about a topic of study. It establishes a convincing thesis to answer the research question". Literature review gives an overview of what has been done, who the key researchers are, what the prevailing theories and hypothesis are, what questions are still to be asked, and what methods and methodologies are appropriate and useful or not useful to the study (McMillan & Schumacher 2001). The purposes for the review of empirical literature include: (i) To guarantee the reviewers that the researcher knows and understand the topic and issues related to it, (ii) to highlight other studies conducted which are related to the topic, (iii) to introduce and conceptualise the variables that will be used to guide the process of the study, (iv) to make the researcher's study relevant to the present knowledge, (v) to help define and limits to the research problem, (vi) to help develop the research hypothesis, and, (vii) to enable the researcher to avoid repetition.

In this chapter, the study reviews the empirical literature on knowledge commons from outside Africa. This chapter also review studies on libraries as commons from the African continent, including the state of knowledge commons in South Africa.

4.2 Empirical studies on knowledge commons from outside Africa

Arguably, literature shows that commons can be traced to the platform which exposed the struggles of possessing commonly shared resources during the 17th centuries. For example, the study of Zimmerman (2003) emphasised that indeed it was during the architects of American democracy around the 1730s when it was declared and maintained that the entire society particularly the non-elite members, must access information. This resulted in the establishment of the Library Company of Philadelphia in 1731 which was the first lending library and it became the predecessor of the free open access public library. This was an initiative of Benjamin Franklin Historical Society and Junto Club members who took upon their hands to assist the non-elites in accessing free information because purchasing of books was then expensive (Benjamin Franklin Historical Society 2014; Library History Buff 2005-2012).

It was during the years of 1990s, when the International Association for the Study of Commons (IASC) was still in its' infancy stage, Hess (2008) began her work to build a commons library which was outside the traditional commons sectors such as fisheries, agriculture, forests, water, wildlife, etc. Her study asserted that other scholars also deviated from these traditional commons and focussed on expansion of non-traditional commons in other sectors. Furthermore, the idea of libraries as commons was also supported by Nancy Kranich a former President of American Library Association in 2000 – 2001 which tremendously changed the nature of American libraries as commons (Kranich 2003, 2007). One would argue that the role of American public libraries as a community hub for reliable community building, learning and information is critical for their future resilience.

Initiatives undertaken by some of the American libraries to address the idea of libraries as commons is extremely important (Blair 2013). For example, Santa Monica Public Library was trying to bring their community to them by circulating handy things they might need at house such as, kitchen utensils, toys, tools even humans. The library allows the community to approach people they see every day. For instance, Blair (2013, par.6) indicated that community had an opportunity to choose 40 human books from library collection, thereafter, they would sit and have one-on-one dialogue for 20 minutes which can be extended to 40 minutes. In Santa Monica Public Library,

‘human books’ or ‘human’ are catalogued like other library collection, sometimes they even leave out the ‘human’ and use catalogue number.

In addition, Santa Monica Public Library held an annual international event - Human Library: What's Your Prejudice? which allows ‘dialogue between people of different backgrounds and beliefs’ conversations about their life experiences (Blair 2013, par.7). Furthermore, Blair (2013) indicated that the library had migrated from just being the repositories for printed and non-printed resources instead they want to reach beyond their limits. It is evident that Hess and Ostrom (2007: 3) were precise when they emphasized the “essence of commons as being not simply an inanimate pooled-collection of artefacts, but rather a shared resource”.

Additionally, an American library near Rochester in New York City, lends out fishing poles and tackle boxes to its community members instead of only books and electronic resources. Blair (2013) reviewed that Honeoye public library is situated near Finger Lakes region and community can fish all throughout the year (Blair 2013, par.2). Community members should be informed and enlighten; however, it was the responsibility of libraries such as Honeoye public library to practise institutionalized sharing of resources among the community members (Madison et al 2010).

The study of Holland (2015, par.1) highlighted the existence of libraries since 2600 BC as “an archive of recorded knowledge”. However, libraries are reinventing themselves from being “an archive of recorded knowledge”, they want to claim their relevance in the digital era and meet the technological needs of their forever demanding communities (Holland 2015, par.1). For instance, in Ashburnham, Massachusetts the Cushing Academy transformed its library space to become a “bookless” library since 2009. It is believed that the digital resources superseded collection of books and a café replaced their information desk. Blair (2013); Holland (2015); Hopkins and Maack (2017) affirmed that rather than libraries being a quiet space for individual studying, it has to evolve and create an environment that is used for collaboration and knowledge construction.

Most of the United States of American school libraries are well-known as repositories of printed materials, however, with the traditional role as storage spaces for books and studying eroded by the emergence of digital delivery of information, are recently in the middle of radical change

(Cicchetti 2015). Burns (2016) argued that the school library perspective was forced to rephrase and accommodate the needs of the 21st century student. However, the study further asserted that many school libraries have not yet change to meet the emerged technology that can accommodate the 21st century student. It is against this backdrop that public libraries are compelled to reinvent themselves as learning commons and create spaces that can accommodate collaboration, interaction, social learning and individual study. It is very difficult to define, learning commons because scholars from the different fields cannot agree on one uniform definition (Bonnand & Donahue 2010). There is a transition that happens when traditional libraries transform into learning commons. This process involves a daunting shift within the library's physical spaces. Learning commons require learning spaces where services such as café areas, technology area, study group and presentation areas. Whereas most libraries are a place where reference and literary materials are kept. Users want both the learning commons and a library to be able to offer their different services in one building. Services such as shared spaces for meetings, content creation, collaborations opportunities, information technology and studying. Transformation of the library into a learning common introduces new components to the existing ones, it is not just about changing or getting rid of what is already in the library (Stark & Sue 2010).

In the United Kingdom, a major concern to reimagine a 20th century library to a 21st century learning commons began in the beginning of 2014 at Oak Hill College (Peacock 2017). A good example in this regard was when Oak Hill College wanted its students to make a difference in the world because they will be independent information seekers, and lifelong learners through the emergence of learning commons (Peacock 2017). Upon these prime factors, the library college was propelled to gradually evolve into a commons. According to Peacock (2017), the library emerged from being a repository of only printed materials to an emerging learning common where the issue of students or staff missing out of other library resources was improved through accession of electronic resources. Evidently, the library became openly a shared resource that has been reconceptualised as commons (Hess 2008). Literature reviewed that the library was forced to structure and organise their decisions about how best they can manage and develop their learning commons (Peacock 2017). For instance, there was an institutional analysis to describe the rule strategies, norms, service providers, decision makers, users, staff establishment and the administration of the college within the commons.

Furthermore, another study by Yao, Liu and Cai (2009) was conducted to study the background and processes of establishing the information commons and future development in Sichuan University in China with the focus on its positive outcomes. Their study revealed that information commons proved its positive impact on improving the usage of physical and virtual space, resources and services of university libraries in the changing information environment (Yao, Liu & Cai 2009). Therefore, the construction and development of information commons in Chinese university libraries not only Sichuan University, were provided as one of the recommendations.

In contrast, McNaughton and Rao (2017) stressed the fact that there is still a gap in empirical studies of real-world commons that need to guide and clarify commons governance work. On that note, Ostrom's IAD framework underlies factors that affect the institutional design, policy reform and patterns of interaction within the real-world commons (Hess & Ostrom 2007). Interestingly, the study to explore new innovative mechanisms in Caribbean disaster management was conducted as a response to the call for more empirical studies on the emergence of knowledge commons outside the library's sector (McNaughton & Rao 2017).

HeraldNet (2018) opines that some of the libraries which plays the role of "street-corner university" in their communities are facing the challenge of being close down due to budget cuts from their local authorities in some of towns and cities of Britain. Yet, literature shows that libraries are a world phenomenon and still have a significant role to play in creating knowledge and providing information (HeraldNet 2018; UNESCO/IFLA 2000). Questionably, some of local authorities in the towns and cities across Britain, believe that some of libraries has transformed from being traditional libraries to institutional bedrock of a knowledge commons 'idea stores' which even though successful, but then, according to their judgement, they are wasting the state fund with their prestige projects. It is evident that lack of vision on the side of local authorities expropriate new technology which is one of driving force behind the existing commonly resources within the libraries which provide new ways of sharing and working collaboratively within the action arena (Hardin 1968; Hess & Ostrom 2007). The study revealed that libraries have opportunities to bring the communities into the global conversation and fulfil the principle of open access for all. Empirical studies indicate that most of the American school libraries transformed their libraries into new facilities known as learning commons, in contrast, the Universities in trying

to meet the needs of their students, and to support their academics and postgraduate research students are establishing Research commons.

4.3 Studies on libraries as commons from Africa

The study revealed that public libraries as a trusted information hub, and empowered by information professional, has the authority to provide the communities free access to ICTs and train them. EIFL (2020) asserted that the internet explosion has transformed how communities seek and share information and knowledge, however, billions of people living in developing and transition countries still do not have access to internet based-services. Therefore, the study revealed that public libraries as a trusted information hub, and empowered by information professional, has the authority to overcome this challenge by providing the communities free access to ICTs and train them.

The various actions that support and promote current commons practices in the libraries, in which information resources are freely available through the internet was investigated by Okore, Anaehobi and Haliru (2015), who conducted a study focusing on the level of awareness of open access electronic resources in Edo State in Nigeria, and their findings revealed that the scientists in the research institutes were aware of the existence of open access electronic resources but they had more access to traditional library materials to perform their research work than accessing electronic books and journals. Their study recommended that the two participated agricultural research institutes management in Edo State should provide access to functional internet facilities among others to inform their scientists about the relevance of using the open access electronic resources. As a result of the impact of access to the electronic resources, it is significant that libraries should strive to inform and allow their users to access electronic resources.

Furthermore, according to Tevaniemi, Poutnen and Lahdemaki (2015) cited in Oliveira (2018:64), the transformation caused by learning commons, requested academic libraries spaces to be adjusted into different “kinds of working and learning styles of students”, and also compelled them to repurpose and rethink those spaces. While according to Oliveira (2018), the definition of information commons is not easy, however, Harland (2011) cited in Oliveira (2018) indicated that

in different institutions, there is no common definition of information commons among librarians. This is because the concept of information commons means different things to researchers and other people.

A similar study by Musa (2015) was conducted to investigate the implementation of information commons in Ahmadu Bello University library, Zaria in Kaduna State of Nigeria, using the data collected from the committee members of 15 who were drawn from various units of the library across various team, such as high-level management staff, ICT division staff and supporting staff of Ahmadu Bello University Zaria, Library. Their study concluded that during the information commons implementation, the university met most of the requirements. However, it was therefore recommended that the users and collaborating units should be involved when the university make the decisions on concepts of vision and mission, including formulation of policies.

In agreement to this study which have tried to support and promote the tradition of being open and investigating strategies to implement information commons in academic libraries. According to the study of Hess and Ostrom (2007: 10), “the introduction of new technologies can play a huge role in the robustness or vulnerability of a commons”, therefore, it was necessary for the university to implement policy formulation to accommodate the characteristics of discipline and avoid what Kling and McKim (2000) cited in Hess and Ostrom (2007: 10) called misguided hypothesis “sooner or later everyone will catch on”. The study of Ostrom (2005) posited the fact that idea of rules must be the key concept in the institutional analysis.

Hoffmann (2017) conducted a case study to examine CODESRIA as a pan-African knowledge common in Dakar Senegal, with the aim to reveal information on the organisation and its intellectual contributions in the post-independence period. Her study was also focusing on the elements that formed CODESRIA as a Pan-African knowledge common in the context of epistemic inequality. According to Hoffmann (2017), the findings revealed significant aspects including the analysis of CODESRIA structural adjustment which influenced the intellectual, material and organisational transformation. Her study further revealed that in the distant future, the structural adjustment would destroy the public universities which were depending on CODESRIA, and the methods to sustain the organisational intellectual strength among others.

With regards to the central argument of Hoffmann's study, it was indicated that inequality can motivate and limit members to engage in the collective action needed to sustain the knowledge commons. Her study contributed to the literature on knowledge commons, empirical literature on African intellectual communities, and reconceptualising of knowledge commons in terms of inequality, and development of IAD framework among others (Hess & Ostrom 2007; Hoffmann 2017).

Next, the development of physical spaces within the learning sectors influenced not only academic library services, but also school library services. Discussion around the relevance of school library media to educational advancement – virtual library learning commons becomes an important aspect in Africa. Tuesday Bwalya an editor of *The Mast Online* who most of time speaks about politics, surprisingly, in his column *Libraries in Zambia need to transform into learning common*, he discussed the issue of transformation of libraries into learning commons (Bwalya 2020). His argument was based on the fact that the philosophy of Zambian libraries was to provide 1960s traditional library services, for instance, providing access to their circulation desk to borrow printed materials, and in-house usage among others. The point of this highly emphasized the significance of libraries regardless of their nature.

It is within this context that Bwalya suggested the establishment of learning commons as a provision of learning space dedicated particularly for study purposes, creation and playing and also physical space that will provide additional pathways to learning and content acquisition in the form of digital technologies (Bwalya 2020). Digital technologies and open paradigms have had a transforming effect on users who require a new space that allows participatory, interaction, and construction of understanding from different information sources in the learning commons (Bwalya 2020). Unfortunately, libraries in the Western World have transformed and provide 21st century library services which are free, while, either is public library or academic library, Zambia do not provide those modern services.

As an example, some of these facilities are dilapidated and still preserve artefacts that are outdated and not relevant to the community needs. By comparison, the value of library transformation is depicted when the President Recep Tayyip Erdoğan during the campaign rally ordered Turkish

public libraries to transform their library services and open 24 hours a day, and create spaces for coffee and tea shop (Bwalya 2020). This initiation was an effort to increase library collection usage and to attract a variety of community members' regardless of their age. As he concluded, he pleaded with the Zambian leadership that there is a need for Zambian libraries to transform into learning commons, because that will improve and contribute to future generation in their country.

Nearly two decades ago, African Leadership Academy (ALA) was launched, and focused on developing young Africans who have the potential to impact change in the African continent (Uni24 2020). As part of the specific emergent knowledge commons events in Africa, the academy had a vision of achieving social impact and growing the continent, by developing a network of more than 6 000 leaders within the continent. For the same reason, MMA Design Studio (2017) a partner for four-year, decided to redesign the Honeydew campus in Johannesburg to accommodate the academy's vision of sharing and collaboration. The results of this initiative re-purposed an old building factory and transformed it into a learning resource centre with a library, a learning space with different teaching and learning equipment and a multi-media centre in 2017 (MMA Design Studio 2017). Therefore, the researcher can conclude that this was an emergence of knowledge commons for ALA students. According to ALA (2020), a question was posed in the Journey Journal to evaluate the opinions of the students who are the end-users of the commons: Why I Love Our New Learning Commons? To answer this question, students from Kenya, Rwanda, South Africa, Nigeria, Morocco, Ethiopia to mention few African countries, highlighted that the new space accommodates their needs and address the issue of inequality because they can collaborate, interact and perform various learning activities without disturbing each other in the commons.

Research reveals that there is a slow progress in African libraries when it comes to an effort to improve and introduce technology to support education programs. Africa is struggling to catch up with her counterpart – Western world when it comes to serve the needs of the population in the information age. Hence Ocholla (2009) in his study posed a significant question: Are African libraries active participants in today's Knowledge and Information society? Ocholla highlights the fact that even if some African libraries are participating in today's knowledge and information

society, he specifically outlined South African libraries in particular, other libraries in most African countries are not yet participating.

In 1986, the University of Botswana envisaged to automate their library collection in 1989. They successfully managed to install integrated library software which became operational only in 1996 (Mudogo 2012). Since then, various development and innovations were introduced and implemented to promote and embrace technology. According to the exploratory study of the University of Botswana, research was conducted to address the attitudes, perceptions, and skills needed by all stakeholders in its quest for graduates use information completely, and that was the emergence of piloting learning common (Mudogo 2012). However, challenges were experienced which relate to the changing of roles that involve the librarians who have limited skills in operating the commons, interacting with the students, collaborative relationships among others.

4.4 Studies and state of knowledge commons in South Africa

The Carnegie Corporation of New York has funded some higher learning institutions in South Africa, including the University of Pretoria on knowledge commons (University of Pretoria 2020). Based on this grant, the University of Pretoria established the Research Libraries Consortium Project was commenced in the year 2006. Interestingly, the Project consisted of three essential elements which aimed at developing researchers in South Africa. One of the three essential elements was to design a space of a Research commons in their library. In recognising the importance of this development, the university was forced to change the institutional arrangements. For instance, according to the University of Pretoria (2020), 80% financial top up was made available for the construction of research commons and other spaces within the library. Not only does emerging research commons redefined research knowledge communities, but it has also tampered with the current setup of the library practices which supersede the existing administration, rules, norms, and laws which may lead to unforeseen outcomes (Hess & Ostrom 2005).

The University of KwaZulu-Natal (2019) has created the Teaching and Learning Commons to serve the special needs of the staff and students in the School of Education and all schools in the

College of Humanities. Furthermore, the University of Kwazulu-Natal (2019, par. 2) learning commons, supported and enhanced “an ecosystem of technology, students, expertise, physical space, equipment, manuals and specific skills development that are freely accessible to all students in order to improve their teaching and learning”.

The value of academic libraries was described by Oakleaf (2010) in her book *The Value of Academic Libraries: A Comprehensive Research Review and Report*. The university libraries play an important role in the development and support of digital learning environment. The University of Johannesburg (2020) in their mission to support interconnected research world, created spaces for Research Commons which were defined at all the campus libraries. The physical spaces within the university libraries were allocated to be used for research purposes; therefore, they were reserved for postgraduate students, researchers and postdoctoral fellows (University of Johannesburg 2020).

In 2011, the Stellenbosch University library honoured the state of art Research Commons by opening its doors to master’s and doctoral students as well as researchers to embrace their research activities and scholastic dialogue (University of Stellenbosch 2019). The general purpose for the establishment of the commons was to create a dedicated space for research exchange and production. Therefore, the Research Commons was located on the lower level of the university, and the commons offer “researchers the flexibility of engaging in debate and exchange in the seminar rooms, relieve stressed minds in the lounge area or engage in rigorous self-study at the designated computer work areas” (University of Stellenbosch 2019, par.1).

Van Wyk and Kadzenga (2017) conducted a study to investigate the issue of reconsidering a digital learning common in a private higher education institution in South Africa. Their investigation measured the impact which led to their first digitally-enabled campus known as ‘connected campus’ which provide for distance learners. Recommendations tailored a new concept of a ‘Digital Learning commons’ to be researched, designed and implemented as a new digital service within that private higher education institution. Van Wyk and Kadzenga (2017) further indicated that emerging digital learning commons paradigm “...sets new trends in higher education in Southern Africa for supporting learner and academics...” (Van Wyk & Kadzenga 2017:32).

Finally, a discussion of public, academic and school libraries readiness to denote a general learning spaces and digital environment into social spaces that allows interaction, policy reform and make electronic resources easily accessible along with tangible and intangible artefacts still need to be studied.

In 2001, the University of Cape Town (UCT) inspired by the innovative facility in the Leavey Library at the University of Southern California in Los Angeles, proposed Knowledge commons for their undergraduate students to access a redesigned physical space and many electronic resources that will assist with their work (University of Cape Town 2019). Proposing the adoption of Knowledge commons, the University of Cape Town (2019), developed a “one-stop-shop” which emerged to be the most popular services on the campus. Viewing knowledge commons as a ‘one-stop-shop’, Ostrom (2005) highlighted that it is a confluence of resources, services and spaces. The foregoing discussion of the Knowledge commons clearly indicates that the advent of Internet explosion of electronically available information, and the expectation from the community to access it instantly grew, and therefore, it made accessibility to computers very critical (White et al 2005).

In 2008, a new, access-controlled facility known as Research Commons was opened only to the postgraduates and academic staff in the main library of the University of Cape Town in South Africa (Daniels et al 2010). The study of Daniels et al (2010) indicated that even though the university was already having a successful knowledge common for undergraduates and academic staff, the Research commons was a superficially similar to the existing knowledge commons. Research commons was a project funded by the CCNY in trying to capacitate the capabilities of South African university libraries. The space has become a sophisticated space equipped with physical technology infrastructure, with dedicated staff that offers a specialised support in research skills and subject domain especial to the students previously from under privileged background (Daniels et al 2010).

Nonetheless, Daniels et al (2010) hypothesized that UCT library users needed not only support in subject domains from the library staff, but also assistance and guidelines in understanding the processes of research. Evidently, in 2005, the university conducted a LibQUAL+ survey in an

attempt to develop appropriate evaluation standards for the Research commons (Daniels et al 2010). The study reviewed that LibQUAL+ was used as an instrument that is revealing library services users want, and to what extent does the library provide those services (Daniels et al 2010). To validate the hypothesis, the responses from the academic staff and the postgraduate students indicated that even though they value the support received from staff, however, the new facility does not meet the requirement of the research area. Daniels et al (2010) study further indicates that validation which resulted from the LibQUAL+ surveys was needed to measure the success of the Research commons practices. This posed a significant question to be addressed: How do the library users' everyday experiences and encounters in and outside the library support inform the emergence of Research commons practices in the academic libraries?

Similar trend is observed at the University of the Witwatersrand library whereby the needs of the postgraduate students at the level of Masters and Doctoral degree was considered (University of Witwatersrand 2018). The university library also received funding from CCNY to capacitate the capabilities of the academic staff and researchers (University of Witwatersrand 2018). As described by the university, it was necessary to construct Research commons in order to recognize and balance the diverse needs of their different scholarly community (University of Witwatersrand 2018). It is evident that the digital quiet research space is used for seamless access to research information, interaction and collaboration by the research students and academics.

Supporting this view, Mojapelo and Dube (2015) affirmed that in South Africa, school library systems are still underdeveloped. In addition, the study of Cicchetti (2015) posited that school libraries are iconic in nature, during their pre-internet era; they were regarded as repositories of human thought where printed resources can be easily accessible. However, evolving technologies in the information economy offer another incentive that has prolonged the limitations of school libraries into realms that require re-adaptation, re-conceptualization, re-imagination, and re-configuration of its critical functions. It is evident that access to information and knowledge has to continuously change to meet the needs of learners with flexible learning and digital environment.

The first empirical study on knowledge commons in South Africa is the study of Daniel et al (2010) in which they explored the use of the research commons in the University of Cape Town during its first year of operation. The essence of the study was to attempt to establish whether it actually provided a genuinely new and different service from the point of view of the end-users, and whether a facility such as this could indeed be presumed to support research and enhance research output at the university. They used Lippincott's assessment grid to assess activities in the research commons according to the dimensions of extensiveness, efficiency, effectiveness, service quality and usefulness (Lippincott 2006). The approach adopted was a mixed method triangulation research design combining quantitative and qualitative components that logged the extent and nature of the use of the various facilities in the research commons. They sought to establish stakeholders' perceptions about whether the services are substantially different from those in the undergraduate knowledge commons and whether they are indeed seen to be supporting research activities. They found that the evidence gathered demonstrates that the research commons, designed primarily as a site for the creation of new knowledge in the form of original writing by researchers at postgraduate and academic level, was a parallel invention. Earlier in 2005, a study was conducted on the value of peer assistance in student use of electronic library facilities in the same university unambiguously found that students were expressing the need for knowledge commons in the University of Cape Town.

4.5 Synthesis of the review of empirical literature

This chapter focused on the empirical evidence relating to knowledge commons from outside African continent. The empirical literature revealed that the commons can be traced back to the 17th centuries and be associated with the struggle of possessing shared resources. Furthermore, empirical literature presented studies on libraries as commons from other countries in Africa. In conclusion, studies on the emergence of commons in South African libraries were reviewed. The next chapter will provide the research methodology.

CHAPTER FIVE

RESEARCH METHODOLOGY

5.1 Introduction

In Chapter Four, the thesis reviewed the empirical studies based on the knowledge commons from outside African continent, including studies on libraries as commons from other countries in Africa. The previous chapter also reviewed the studies on emergence of commons in South African libraries.

This chapter describes the research methodological, theoretical analysis of the approaches applied to conduct this study. Research is described as the demonstration of an inquisitiveness to study and learn more (Beck & Manuel 2008). According to Babbie (1989), research methodology is concerned with the specific tasks of the research process such as research design, data collection or sampling, among others. Howell (2013:9) considered methodology as a

...the general research strategy that outlines the way in which research is to be undertaken and, among other things, identifies the methods to be used in it. These methods, described in the methodology, define the means or modes of data collection or, sometimes, how a specific result is to be calculated (Howell 2013:9).

Furthermore, Novikov and Novikov (2013) define methodology as philosophy of organisation of a scientific activity. In this regard, attention is given to the nature and kinds of processes to be followed in a procedure or to attain an objective. Methodology encompasses the body of techniques for measurement, arrangement, re-expression and analysis of information. Methodology determines the direction in which the examination of scientific theory is pursued and the theoretical construct which outruns available methodology for validation soon becomes stale or unproductive. The expressive range of methodological language also shapes the generation of theory and, in much the same manner that practical media and formal structural constraints influence art and literature, the limitations of theoretical and methodological constructs may prove stimulating or stifling to a science at a particular stage of maturity. In any science, a period of primarily methodological rather than substantive development may sometimes be necessary to unblock the logjam created by theories and measurements which cannot effectively interact

through existing tools (Ciriacy-Wantrup & Bishop 1975). A research adapts certain philosophical stances to elucidate phenomena and methods that are used to attain conclusions and get resolutions to research problems (Gay, Mills & Airasian 2009).

5.2 Philosophical assumptions

System of theories and assumptions about the development of knowledge is often called research philosophy, because knowledge is developed in a particular study. It is therefore significant to know what these assumptions are in order to conduct and evaluate any study. A philosophical assumption can be generally described as the theoretical basis upon which researchers collect, analyse and interpret the data they collect from the field. Philosophical assumptions form the background that guides inferences and conclusions. Generally, a research undertaking touches on, and is guided by, four major philosophical assumptions namely: ontology, epistemology, axiology, methodology/approach and rhetoric. Each of these assumptions is old in its command of attention over and interest time, and has generated large and sometimes contentious issue. The researchers' interest in these concepts was how the concepts relate to and how they can help organise research for a better output. The researcher gave some space for each of the concepts, linking them as much as possible with the theories and other aspects of the study. The first of the concepts of interest was ontology.

(i) Ontology

A researcher undertook research with the curiosity to examine issues that often cut across interrogation of the meaning of being, of objects, of other, and their interconnections and relations. Are the objects under investigation, for example concrete or abstract? Are they existent or non-existent; are they real or ideal; are they independent or dependent?

Terre Blanche, Durrheim and Painter (2006:6) defined ontology as:

- a) the branch of metaphysics dealing with the nature of being, or,
- b) a set of concepts and categories in a subject area or domain that shows their properties and the relations between them.

Kivunja and Kuyini (2017) expand this definition by stating that:

Ontology is the philosophical study of being. More broadly, ontology studies concepts that directly relate to being, in particular becoming, existence, reality, as well as the basic categories of being and their relations". Ontology is related to Metaphysics (Kivunja & Kuyini 2017:26-29).

Aristotle reasoned that to create anything, one must bring together form (morphe) and matter (hyle) (Ingold 2010). Basically, ontology is concerned with the assumption that there is either a single reality or multiple realities that can be observed, and that individuals have varying interpretations and that their findings may or may not be generalized to the entire population (Madondo 2015). According to Kivunja and Kuyini (2017), ontology focuses on establishing the real nature, or the basic concepts, which make up themes that the researcher analyses in order to make sense of the meaning inherent in research data.

(ii) Epistemology

Epistemology was concerned with how researcher comes to uncover the truth, or the reality. What is the nature of the knowledge and understanding that the researcher can possibly possess in order to extend, add, broaden and deepen what is known in his or her field of research? (Kivunja & Kuyini 2017). Extended further, epistemology was concerned with the nature and forms of knowledge, regarding how it could be acquired, and how it could be disseminated and applied. Epistemology often addresses the questions associated with the relationships between what is real and the researcher (Kivunja & Kuyini 2017; Mhlongo 2018). It is concerned with knowledge being objective, and subjective, and can be generated through scientific research (Madondo 2015). Epistemology enabled the researcher to position herself in the research context in order to effectively uncover what else was new, based on what was known.

(iii) Axiology

Axiology focused on the ethical issues that were considered when carrying out this research. They included privacy, accuracy, property and accessibility (Kivunja & Kuyini 2017). The role of value or the right decisions; was considered by the researcher (Finnis 1980; Madondo 2015). It entailed considering, evaluating and comprehending concept of appropriate behavior as regards the research. Social inquiry is either value bound or value free (Chilisa 2011). Thus, researcher may

choose or choose not to be concern with ethics, values and biases (Madondo 2015). This consideration necessitated the following questions: What values guided the researcher to conduct research? What needed to be done to respect all participants' rights? What morality and characteristics were considered? Which cultural, cross-cultural and moral challenges were considered and how the researcher addressed them? How best the researcher secured the goodwill of participants? Did the researcher conduct the research with justice and integrity? Did the researcher avoid or minimize all forms of risk or harm?

(iv) Methodology

Methodology relates to the process deployed in this research. Such a process may be either deductive or inductive Ngulube and Ngulube (2015) or combination of both in a single study. From methodological perspective, a paradigm employs either (1) Quantitative approach; correlational; quasi-experimental; experimental; causal comparative; survey or (2) Qualitative approach; phenomenology; ethnographic; symbolic interaction; naturalistic or (3) Combination of quantitative and qualitative action research; mixed methods of data collection, participatory research (Chilisa 2011; Madondo 2015).

(v) Rhetoric

This related to the description of findings of a study in particular - that was, what language was used to persuade or inform (Firestone 1987). The focus of inquiry may be either idiographic or nomothetic. Idiographic connotes that a research emphasizes the individual as a complex entity. Thus, the reporting is highly descriptive and comprehensive. Nomothetic relates to the entire population, and targets on prediction and explanation that are generalized (Ponterotto 2005). Finding may be presented from the viewpoints of the researcher or using the words of the participants themselves or combination of both. The style of reporting can be objective, subjective or combination of both (Madondo 2015). Rhetoric also involves how the researcher convinces the reader that his or her findings are valid (Wagner, Kawulich & Garner 2012).

5.3 Research paradigms

Paradigms in research are often discussed along the lines of whether the research is positivist/constructivist, interpretivism and pragmatist. According to Olsen, Lodwick and Dunlop (1992:16), paradigm indicates “a pattern, structure and framework or system of scientific and academic ideas, values and assumptions”. Positivism assumes that the social world can be studied the same way as the physical world (Kim 2003). Constructivism is based on the belief that human beings construct their own knowledge and experiences of the world through their personal experiences (De Vos, Strydom, Fouché & Delpont 2011). According to Myers (2008:38), “... interpretive researchers assume that access to reality (given or socially constructed) is only through social constructions such as language, consciousness, shared meanings, and instruments”. Pragmatists are in a position which argues that it is possible to work with both positivism and interpretivism positions (Saunders, Thornhill & Lewis 2009).

Table 5.1 and 5.2 show the relationship between the assumptions and the research paradigms. A positivist view nature as a reality, objective, singular, and far removed from the researcher’s world; a positivist is quantitative, value free and unbiased, remove the researcher from what is being researched and formal in language. An interpretivism on the other hand is realistic, subjective and accommodates multiple positions and opinions; an interpretivism is qualitative and inductive, value loaded, and the researcher and the research are inseparable while language is informal and evolving throughout the research. The pragmatist combines singular and multiple positions and opinions in the same environment, collect qualitative and quantitative data, multiple stances, reported in formal and informal language (Neuman 2013; Ngulube & Ngulube 2015; Sarantakos 2013).

Table 5.1: Philosophical assumptions with reference to reality

Assumption	Question	Characteristics	Implications for practice (examples)
Ontological	What is the nature of reality?	Reality is subjective and multiple, as seen by participants in the study.	Researcher uses quotes and themes in words of participants and provides evidence of different perspectives.
Epistemological	What is the relationship between the researcher and that being researched?	Researcher attempts to lessen distance between himself or herself and that being researched.	Researcher collaborates, spends time in field with participants, and becomes an “insider.”
Axiological	What is the role of values?	Researcher acknowledges that research is value laden and that biases are present.	Researcher openly discusses values that shape the narrative and includes own interpretation in conjunction with interpretations of participants.
Rhetorical	What is the language of research?	Researcher writes in a literary, informal style using the personal voice and uses qualitative terms and limited definitions.	Researcher uses an engaging style of narrative, may use first-person pronoun, and employs the language of qualitative research.
Methodological	What is the process of research?	Researcher uses inductive logic, studies the topic within its context, and uses an emerging design.	Researcher works with particulars (details) before generalizations, describes in detail the context of the study, and continually revises questions from experiences in the field.

(Source based on McLaughlin 2003)

Table 5.2: Relationship between the assumptions and the research paradigms

Paradigms	Question reflected	Paradigm		
		Positivism	Interpretivism	Pragmatism
Ontology	What is the nature of reality?	Reality is objective, singular and aside from the researcher. (i) Realist: Independent of human thoughts and beliefs (ii) Critical realist Interpreted through social conditioning	Reality, subjective, multiple opinions as seen by the participants	Singular and multiple realities (e.g., researchers test hypotheses and provide multiple perspectives)
Methodology /Approach	What is the process of research?	Quantitative: Deductive, cause Static categories, before context generalisations, leading to prediction, explanation, understanding. Accurate and reliable through reliability.	Qualitative: Inductive process, the mutual simultaneous shaping of factors, emerging design categories identified during the research process, context bound, patterns, theories developed for understanding. Accurate and reliable through verification.	Combining (e.g., researchers collect both quantitative and qualitative data and mix them).
Axiology	What is the role of values?	Value-free and unbiased (e.g., researchers use checks to eliminate bias).	Value loaded and biased (e.g., researchers actively talk about their biases and interpretations).	Multiple stances (e.g., researchers include both biased and unbiased perspective).
Epistemology	What is the relationship between the researcher and that being researched?	The researcher is independent of that is being researched. Distance and empathy (e.g., researchers objectively collect data on instruments).	Researcher interacts with what is being researched (e.g., researchers visit participants at	Practicality (e.g., researchers collect data by “what works” to address

			their sites to collect data).	research questions).
Rhetorics	What is the language of research?	Formal, based on set definitions, impersonal voice, and use of accepted quantitative words (e.g., researchers use agreed-on definitions of variables).	Informal, evolving decisions, personal voice, accepted qualitative words (e.g., researchers write in a literary, informal style).	Formal or informal e.g., researchers may employ both formal and informal styles of writings.

(Source based on McLaughlin 2003)

5.4 Research approach

Research approach means the plans and the procedures a research adopted to encompasses the steps from broad assumptions to detailed methods of data collection, analysis, and interpretation (Grover 2015). Approaches are also known as strategies or traditions, with little differences (Bryman 2012; Neuman 2013,). Three major approaches exist and they are qualitative, quantitative and mixed methods approaches. Qualitative and quantitative can be used in a single study as mixed method. Both quantitative data and qualitative data are collected in most evaluations and can be used interchangeably. According to McMillan and Schumacher (2001), mixed methods tend to be more practical in designing evaluation studies and less rigid in sticking the research inquiry approaches. The quantitative approach was adopted because of the need to determine relations (Welman, Kruger & Mitchell 2005). Qualitative approach was adopted in the study to gain complimentary in-depth understanding of the opinions and views of the library officials who provide library services (De Vos et al 2011).

The philosophical assumptions of the study, purpose of the study and the research problematic informed the choice of research approaches (Creswell 2014; Kovach 2009; Mills 2014; Silverman 2013). According to Leech and Onwuegbuzie (2009: 265), mixed methods approach allows flexibilities in understanding problems, and offers multiple insights into their solutions.

5.5 Research design/research methods

What is the plan that was adopted to carry out the research and what are the specific techniques that were used to collect data from the participants? (Babbie & Mouton 2009). According to De Vos et al (2011); Mouton (2001), there are different types of quantitative and qualitative research designs that can be applied during the scientific inquiry. The research design consisted of three kinds of research approaches which adopted different types of methods employed to gather and examine data. Table 5.3 presents the types of research designs.

This study involved a mixed method triangulated research design combining: (i) sample survey design to study the library users (ii) population survey to study the libraries and library staff (iii) community analysis, and ethnographic approach, was adopted to study the community. Community analysis refers to the process of collecting information about the library and its community (Martin 1976). The research design employed to study the communities was the descriptive survey technique wherein, a sample is drawn from the population and studied with the aim of making inference about a population. Descriptive research is designed to describe the characteristics or behaviours of a population in a systematic and accurate fashion (Leary 2010). Table 5.3 illustrates the types of research designs.

Table 5.3: Types of research designs

Qualitative research design	Quantitative research design	Mixed methods research design
<ul style="list-style-type: none"> • Case studies • Narrative research • Ethnography • Phenomenology and ethnomethodology • Biographical method • Historical method • Applied and action research • Clinical model • Symbolic interaction • Grounded theory 	<ul style="list-style-type: none"> • Pre-experimental/hypothesis-developing/exploratory • Quantitative-descriptive (survey) designs • Quasi-experimental/associative designs • True experimental; cause-effect/ explanatory designs 	<ul style="list-style-type: none"> • Explanatory sequential • Exploratory sequential • Convergent

(Source based on Mouton 2001: 57)

5.6 Target population

Population is the total number of objects suitable for the study. Population study objects may be individual, group, organisations, human products and events (Welman & Kruger 1999). The population has to be described according to their time, scope, content and element (Nachmias & Nachmias 1996). According to Babbie, Halley and Zaino (2003:112), population is a “group about whom the researcher wants to draw inferences”.

This study consisted of four populations namely: (i) the libraries (ii) the librarians and, (iii) the library users and (iv) nine communities. There were 34 public and dual-purpose libraries in Thabo Mofutsanyana District, with 80 library staff, and total of 77 805 library membership, serving 34 communities as at May 2018 (ProLib Free State Provincial Library Management System 2018). The population of Thabo Mofutsanyana is estimated 736 288 (Statistics South Africa 2012). Table 5.4 below shows the total number of public and dual-purpose libraries in Thabo Mofutsanyana District with their communities, library membership and library staff.

Table 5.4: Public and dual-purpose libraries in the Thabo Mofutsanyana District

Public and Dual-Purpose Libraries in Thabo Mofutsanyana District	Community	Membership	Library Staff
Bohlokong Public Library	Bohlokong	10 165	3
Moemaneng Public Library	Moemaneng	671	2
Leratswana Public Library	Leratswana	432	2
FatengtseNtsho Public Library	FatengtseNtsho	1 876	2
Memel Public Library	Zamani	882	3
Petsana Public Library	Petsana	2 619	2
LS Sefatsa Public Library	Matwabeng	1 717	3
Mashaeng Public Library	Mashaeng	1 667	4
Meqheleng Public Library	Meqheleng	2 789	4
Intabazwe Public Library	Intabazwe	1 101	2
Reitz Public Library	Reitz	1 231	2
Vrede Public Library	Vrede	1 115	2
Warden Public Library	Warden	1 475	2
Ezenzeleni Public Library	Ezenzeleni	1 236	2
Kestell Public Library	Kestell	956	2
Marquard Public Library	Marquard	993	2
Senekal Public Library	Senekal	1 563	2
Bethlehem Public Library	Bethlehem	8 209	4

Bakenpark Public Library	Bethlehem	1 478	2
Rosendal Public Library	Rosendal	1 136	2
Clarens Public Library	Clarens	864	2
Lindley Public Library	Lindley	1 689	2
Ntha Public library	Ntha	751	2
Petrus Steyn Public Library	Petrus Steyn	1 246	2
Mamafubedu Public Library	Mamafubedu	1 111	2
Tshiame Public Library	Tshiame 1	433	1
Harrismith Public Library	Harrismith	2 039	3
Diyatawala Dual Purpose	Harrismith	429	2
Morena Likhong Moloi Dual Purpose	Harrismith	367	1
RJR Masiea Children's Library	Phuthaditjhaba	10 283	4
RJR Masiea Public Library	Phuthaditjhaba	12 236	4
Ficksburg Public Library	Ficksburg	1 389	2
Clocolan Public Library	Clocolan	968	2
Hlohlolwane Public Library	Hlohlolwane	689	2
Total	34	77 805	80

(Source based on ProLib Free State Provincial Library Management System 2018)

Table 5.5: The towns and municipalities of the participating libraries in the Thabo Mofutsanyana District

Participating public libraries	Communities of the participating libraries	Municipalities of the participating libraries
Bohlokong	Bethlehem	Dihlabeng local municipality
FatengtseNtsho	Paul Roux	Dihlabeng local municipality
Mashaeng	Fouriesburg	Dihlabeng local municipality
Moemaneng	Marquard	Setsoto local municipality
LS Sefatsa	Senekal	Setsoto local municipality
Meqheleng	Ficksburg	Setsoto local municipality
Leratswana	Arlington	Nketoana local municipality
Petsana	Reitz	Nketoana local municipality
Zamani	Memel	Phumelela local municipality

(Source on ProLib Free State Provincial Library Management System May 2018)

The study population comprised an entire group of people that the researcher desired to learn about (Stangor 2011). The present study focussed on nine libraries, which participated in the Mzansi On-line Project Country Grant, initiated in South Africa in 2016 following the advent of Mzansi Libraries On-line pilot project that commenced in 2014 – 2015 (National Libraries of South Africa 2014; 2016). The reason for this delineation was because these libraries and their staff were advanced in information technologies applications. Coincidentally, some of these nine

participating libraries have implemented Makerspaces in their library buildings. Table 5.6 is illustrating the nine participating libraries in the Thabo Mofutsanyana District which have 25 library staff and 22 818 library users as at May 2018.

Table 5.6: The nine participating libraries in the Thabo Mofutsanyana District

Participating Public Libraries	Location of Libraries	Library staff	Library users	Sample
Bohlokong	Bethlehem	3	10 165	161
Moemaneng	Marquard	2	671	11
Leratswana	Arlington	2	432	7
FatengtseNtsho	Paul Roux	2	1 876	30
Zamani	Memel	3	882	14
Petsana	Reitz	2	2 619	41
LS Sefatsa	Senekal	3	1 717	27
Mashaeng	Fouriesburg	4	1 667	26
Megheleng	Ficksburg	4	2 789	44
Total	9	25	22 818	400

(Source based on ProLib Free State Provincial Library Management System May 2018)

5.6.1 Sample size

According to De Vos et al (2011); Nachmias and Nachmias (1996), in a population of a large group of people, a ‘sample’ is selected, while, McMillan and Schumacher (2001) emphasized that ‘sample size’ determines the number of subjects in a study. Therefore, the researcher determined the size of the study which consisted of (i) the District consisted of 34 libraries (ii) 80 librarians altogether (iii) the population of users for these libraries is 77 805 as at May 2018 and (iv) nine communities in the study.

Nine libraries were selected for the study based on their participation in the Mzansi On-line Country Grant project in 2016 (National Libraries of South Africa 2016). The nine libraries had a library staff size of 25 and the population of users in the libraries is 22 818 (ProLib Free State Provincial Library Management System 2018). At the level of users, at 95% confidence level and 40,5% confidence level yields an overall sampling sample size of 400 for the library users. Leedy and Ormond (2010) propose that beyond a point of 5 000, a sample size of is adequate. To achieve

a sample for each cluster, 400 was used to multiply the sampling fractions (obtained by dividing the grand total with size of each library users) of the library user's population.

5.6.2 Sampling

Sampling is the process of using a small number of units of analysis of a study population as a representative of the entire population. McMillan and Schumacher (2001); Mouton (2001) described types of sampling methods as systematic sampling, multistage sampling, cluster sampling, convenience sampling, simple random sampling and stratified sampling. For this study:

- (i) Probability sampling was used to select library users that participated in the study. Probability sampling is a type of sampling technique whereby a sample is selected from a larger population in such a way that every case in the population has an equal chance of being selected. McMillan and Schumacher (2001: 170) state that "Probability sampling makes use of the laws of probability in the selection of the sample and in the construction of efficient estimators. Probability sampling provides a means for saying how good one believes an estimate is relative to all the possible estimates from all the possible samples. That is, probability allows researchers to extend results from the sample to the entire population" (Mulry & Navarro 1995).
- (ii) All the library officials were involved in the study, a census survey; library officials spoke on behalf of the libraries.
- (iii) Sixteen community leaders and 17 key library officials were selected using purposive sampling. In this type of sampling, the researcher chose cases considered relevant to the study. Usually, these cases may not be representative of the population, as the choice of cases is purely judgemental. However, the cases were picked based on spelt-out criteria that relates to adequacy of knowledge of the cases as sources of data for the study.

5.6.3 Selecting Specific Data Collection Cases

- (i) A sampling frame of the library users in each library was constructed based on the list of library users available in the libraries. A systematic sampling technique was used to select specific cases using a different sampling fraction for each community (Opsomer, Fernandez & Li 2012; Sampath & Ammani 2012). The study opted systematic sampling which according to QuestionPro (2020, par. 2) “systematic sampling is a probability sampling method where the elements are chosen from a target population by selecting a random starting point and selecting other members after a fixed sampling interval”.
- (ii) The researcher enumerated 17 library officials and formally enlisted them for the study. Two library officials were selected from each participating library, except for one library where one library official had circumstances beyond her control, for that reason, the researcher interviewed one library official.
- (iii) Sixteen community leaders were selected from nine communities, and were identified with the cooperation of the library officials. The researcher with the cooperation of the library officials selected two community leaders from each participating library except one library which was already affected by Covid-19 virus pandemic restrictions. These community leaders included a wide range of people including community leaders, heads of institutions, professionals, and distinguished residents who were considered to have first-hand knowledge about those libraries. These experts, with their knowledge and understanding, provided insight knowledge on the evolutionary nature of the information needs and behaviour in the community, and the libraries and gave recommendations.

5.7 Instrumentation

Instrumentation means how the various instruments used to carry out the survey were constructed *vis à vis* the nature and sources of the variables. The instrumentation for this thesis constituted a very difficult huddle to scale. Basically, studies that have adopted quantitative approach in deploying IAD framework were not found. The variables used in this study were therefore

constructed by the researcher; but they were pre-tested and validated with the opinions of selected members of the science community in Africa.

5.8 Data collection instruments and methods

Two instruments were used for data collection namely, a questionnaire and an interview schedule. A questionnaire is a set of questions intended to record responses from respondents in a standardized manner (Bhattacharjee 2012). An interview schedule is a collection of data requiring verbal communication between the subject, respondents and the researcher. The study used a structured and unstructured interview guide to engage in a conversation with 17 library officials and 16 community leaders (De Vos et al 2011).

5.8.1 Description of the Questionnaire

The questionnaire started by requesting the demographic characteristics of the 180 library users who were the respondents to the questionnaire. Daniel et al (2010), in their study of the commons of the University of Cape Town has avers that:

Any library service in South Africa needs actively to take into account the demographic, cultural and linguistic diversity of the South African population, as well as the highly inequitable access to education that characterized our recent past and that continues, despite best efforts, into our present (Daniel et al 2010:14).

Race and gender of library users are sensitive issues in South Africa, and also elsewhere and many studies have reached a consensus that the demographic profile of library user communities in the country is extremely diverse. In a recent study, Donkor and Nwagwu (2019) have shown that personal factors of individuals affect the way they use their personal information.

The first section A of the questionnaire collected data about the respondents' identity, regarding whether he or she is a community leader, head of an institution, professional, distinguished resident, or other. Next was the respondents age, namely, whether the respondents were between the ages of 18-24, 25-34, 35-44, 45-54, or above 54. The questionnaire asked how long the respondents have been using the library and their race namely African, Asian, Coloured, White, or

Others. Data on the sex of the respondents whether male, female or other was collected. Then the Highest educational qualification regarding whether the respondent had less than high school certificate, High school certificate or equivalent certificate, Tertiary certificate, diploma, degree, Postgraduate degree and No schooling. Marital status was assessed as whether the respondent is single and have never been married/never lived together as husband/wife/partners, Legally married (including traditional, religious, civil, etc.), Separated but still legally married, Divorced, Living together like husband and wife/partners, Widowed, or single, but have lived together with someone as husband/wife before.

Section B guided data collection on knowledge of the respondents about open access and knowledge commons. Below are opinions about recent developments in respect of access to knowledge published in the electronic environment. As much as you can, please supply us your opinions, perceptions and feelings with respect to the development. Assertive statements about open access were made, and respondents were expected to Strongly agree (5) Agree (4), Undecided (3), Disagree (2), or Strongly disagree (1). The assertions ranged from whether open access resources are available in commons, knowledge published is enclosed in the commons in the library, open access resources often apply copyright restrictions, knowledge increases and spreads best when there are no restrictions to access, or open access has a greater research impact for students and or library users. Others were: education resources must be published with open licenses; open access resources supplement online library materials; and access to electronic resources is clear in terms of intellectual property rights to no intellectual property rights in the commons.

Additionally, section C assessed whether they consider the social and material resources of the commons in the commons as supportive diverse information and other engagement necessary to stimulate learning. The space has all the digital resources I require, I can meet people I learn from, The level of interaction among users of the space is very useful to me, and I have the liberty to influence others positively. Others were: I meet those that influence me positively, I have met people that are disgusting to me in the space, The supportive role of the commons staff is very helpful, and I have at one time or the other acquired some digital resources such as software from

colleagues I met in the commons and I have acquired some digital skills from some people I have met in the commons.

Further in Section B, the study inquired about respondents' opinions about how people's experiences in the commons are reshaping their interests in and identifications with digital literacy. The responses were with respect to whether: The commons is already fast-tracking digital literacy, The commons may fast-track digital literacy in the future, The commons is a distraction to digital literacy and I am yet to address my mind to this kind of issue. Also, the kinds of digital literacy skills and creative competences the commons participants develop were questioned. Are the skills with respect to: Use of digital technologies, Use of free and open access resources, Use of FOSS (Free and open-source software), Use of social media, Use of Internet or Other literacy, not necessarily digital? This is a multiple response question, and respondents were free to choose more than one option. Furthermore, the meanings and motivation users attach to their engagement in the commons was examined. Are these in regards to: The commons is a place to make friends, The commons is a place to meet people who may assist one solve learning and related problems, The commons is a place to pass time, The commons is a place to engage in self-directed learning, and, The commons is a distraction to normal library services.

Section C examined the biophysical conditions of the commons as major attractions to the users: Articles, Books, Computers, tablets or online games, People, or Other. The researcher also examined the non-physical artefacts: Internet, Social media, ProLib library system, Online Public Access Catalogue (OPAC) - stand-alone online bibliography of a library collection that is available to the public, Overdrive (library e-books), Press Reader - digital newspaper and magazine, or Other. Both questions were multiple response types and were measured with the same Likert scale. Next the study examined how content related matters make the commons a major attraction. The following guided the data collection on this matter: Accessing the library websites/ library system (ProLib), Knowledge from electronic documents, Education – computer classes, Digital experience – online gaming, Communication – accessing of personal emails or other.

In Section D, the roles of the users in the commons were examined. Does the user come to the commons: use the resources already existing in the space, periodically provide resources required

to make the commons rich or periodically provide policy ideas to the library regarding how to move the commons forward? These questions were measured with Yes, Undecided or No.

Section E provided data on participating of the users making rules and regulations for the commons. Do they take part in any of the following: Making rules for day-to-day operations of the commons, One of the individuals that interact to decide the operational rules, One of the groups that define who may participate in making collective choices or other? Awareness of the rules and regulations guiding the use of the commons was next examined: who may access the commons, who should contribute to the commons, who could extract or remove content from the commons, who should manage the commons, who could exclude others from accessing the commons, and who has the right to sell or lease content from the commons.

In Section F, incentives for participating in the commons were examined. The first issue here was with respect to whether the commons users are provided with incentives to encourage and facilitate their participation in both using and making rules to keep the commons functional; whether the library has ever requested that users participate in supply of resources to the library for public use, and finally whether the users would be willing to donate tangible or intangible resources to the library if they are requested to do so. The variables were measured as Yes, Undecided or No.

The last section (G) examined the opinion of the library users regarding the outcome of the commons. The issues investigated were whether participating in the commons has consequences for: Increasing the amount and quality of scientific knowledge; Maintaining the sustainability and preservation of the commons; Building standards that lead to high levels of participation in the commons; Ensuring the economic efficiency of the commons; Applying fair standards in the sense that all individuals benefit equally from their contributions; Working towards equality in the commons by redistributing resources to poorer individuals. These were measured five level Likert scale. Outcome was also studied by asking the library users to assess the level of participation in the commons, whether: Fair, unfair or I don't know. Finally, the outcomes of the commons were further assessed by asking the users whether: The commons is sustainable, The commons increase the amount of high-quality scholarship, and, The commons promotes equality among users.

5.8.2 Pre-testing the Questionnaire

Meadows (2003) avers that pre-testing the questionnaire is a very crucial part of the construction of the tool. It helps to validate the content and makes it reliable. Usually, a small number of participants is used to ascertain whether the questions are reliable and whether they are understood by the respondents (Sekaran 2003). Bradburn, Sudman and Wansink (2004) have recommended that 10 to 12 respondents, or another sample from the population being surveyed should be sufficient. Feedback from the pre-test enables the researcher edit the questionnaire for optimal research result.

Two approaches were adopted to pre-test the questionnaire for this study. Recognising the difficulty of defining variables that would a quantitative study guided by IAD framework, the researcher decided to engage scholars in the field. Six scholars – all professors of Information Science in Information Science departments in three universities in Nigeria and South Africa, out of 16 approached for participation, accepted to be engaged in a discussion. The crux of the discussion was on what the opinion of the scholars were regarding the variables that could guide a study using the IAD framework. The researcher listed the constructs, and explained each of them, and then asked for suggestions on the variables that could guide the study. The researcher received responses in prose format. While the responses were considered very helpful, a major departure from three scholars who conflated of the idea of the commons with open access. Furthermore, despite being prominent in the request sent to the scholars, they did not express any knowledge regarding community governance of the resources in the commons. The communication was synthesized to generate the variables that guided the study.

To further ensure that the variables defined from the communication with scholars were understandable, and that they address the issues in the mind of the researcher, the questionnaire that resulted from the engagement with senior scholars was administered to 10 willing commons users from Mangaung and Adelaide Tambo public libraries that were not in the study. The responses showed that evidently, the IAD framework contains constructs that require explanation before they are used in a questionnaire. The researcher therefore decides to remove the constructs from the questionnaire, but rather used descriptions that captured the meaning of the constructs.

5.8.3 The Interview schedules

According to Lewis-Beck, Bryman & Liao (2004:14), “an interview schedule is the guide an interviewer uses when conducting a structured interview. It has two components: a set of questions designed to be asked exactly as worded, and instructions to the interviewer about how to proceed through the questions”. The researcher designed the interview questions to answer the research questions of the study. Unstructured and structured interviews were used to gather data from 17 library officials and 18 community leaders from nine participating public libraries in the Thabo Mofutsanyana District. The researcher used interviews because they are different from questionnaires, they provide first-hand information about the phenomenon. Interviews also provided participants a chance to express their thoughts about what they know. Unstructured interviews are referred to as in-depth interviews which extend or formalise the dialog, while structured interviews mostly deal with one participant at a time (De Vos et al 2011). An interview schedule is a list of questions with structured answers to guide a conversation (De Vos et al 2011). The interviews were scheduled and divided into two sessions for two different respondents, namely, community leaders and library officials. Each participating library was represented by two library officials and two community leaders. (See Appendices G and H for full interview schedule).

5.9 Instrument administration

- (i) The questionnaire was hand-delivered to 180 library users from the nine participating libraries with the assistance of the librarians. A covering letter that requested the respondents to participate voluntarily accompanied the questionnaire.
- (ii) The researcher conducted the interviews with 16 key library officials.
- (iii) The researcher engaged 17 key library officials as voices of the library, and 16 community leaders from the communities in an in-depth interview.

The whole process of questionnaire administration and community leaders’ interviews were captured in the detailed field trip report.

(a) In-depth interviews

A list of both easy and intricate questions was created to ask 17 library officials and 16 community leaders during the interview sessions. The main purpose for asking these types of questions was to gain more information from the respondents. These questions were trying to answer the research questions of this study. The interview questions comprised both unstructured and structured questions to provide the respondents a freedom to express themselves, there were no clues provided to the respondents on how to answer the questions. The interview data that was collected from 17 library officials and 16 community leaders was processed and analysed through thematic analysis which were similar to codes organised together to form a meaning in the database. Data collected from the 33 respondents was transcribed, translated, coded and sorted. The researcher created a non-threatening environment, in order to inspire the respondents to provide accurate and satisfactory information. Based on this fact, English was supposed to be used as a medium of communication with the respondents; however, most of them requested the sessions to be conducted in their vernacular, since South Africa is having 11 official languages. During the analysis process, each question that appears on the interview schedule was analysed and discussed in detail.

5.9.1 Report of the Field Work

Ten public libraries in the Thabo Mofutsanyana District Municipality in Free State province, South Africa, were fortunate enough to benefit ICTs equipment from the Mzansi Libraries On-line Country Grant Project. This project enforced these libraries to redesign physical spaces in order to accommodate the new technologies, and also be transformed into knowledge commons. Therefore, this study was examining whether the emerging knowledge commons in the nine public libraries in the Thabo Mofutsanyana District are resulting to positive outcomes in respect of information needs of the communities they serve. It is obvious that the emerging knowledge commons exposed some advantages and disadvantages to the participating libraries and their users. Literature revealed that there is a limited research conducted about knowledge commons in the Thabo Mofutsanyana District libraries.

On the 11th of March 2020, I embarked on a journey to the Thabo Mofutsanyana District public libraries with the aim of collecting data from respondents. The objective of the trip was to gather more detailed opinions, expressions, views, knowledge and information about the emergence of knowledge commons and also to get exposure of other services they used to render and after they receive ICTs equipment benefited from Mzansi Libraries On-line Country Grant Project. This report highlighted the qualitative and quantitative data collection method, informal conversations and challenges that I experienced.

One of the chosen data collection method for this thesis was interviews. This method makes it easier for me to understand and see how certain questions make the interviewees feel. It allows the respondents to answer the question in depth, allowing for more data to be collected. This process also highlights factors that one does not get when you are not in the field. The respondents were chosen through a systematic sampling because only certain population was targeted. Before the interviews proceeded, I summarised the purpose and aim of the interview and requested the interviewees to sign the consent form. This process was done to all interviewees. They were all informed that their conversation was going to be recorded for transcribing purposes.

I had a chance to have an informal conversation with high school learners who were on the street outside the library. They told me that the library is helpful because they don't have enough computers at their schools. They are visiting the library daily to utilise its resources, for example, books, study hall and ICTs equipment to mention few. I asked them if they are aware of library rules and regulations, they said they are aware of them because they are visible when you enter the library. They also mentioned the fact that they are aware that the ICT resources are not enough, so they wait outside the library until there is a space. There was another library with the same issue and the community members also told me that shortage of ICT resources such as computers meant that some went home without using it.

At one of the libraries, I had the opportunity to interview a political and community leader. During the interview, we had an interesting conversation with the interviewee because he disagreed with the fact that commons exist because he stated that not all community members access the shared resources at libraries. This made me aware of some perceptions that users have about the libraries.

This made me to think about why some community members do not use the library services because they believe that not all resources available are accessible to them.

I encountered a number of challenges that made collecting my data a bit difficult. Challenges such as costs, language, lack of municipal services and the Covid-19 virus pandemic. Firstly, it was very expensive because travelling costs include diesel, food and accommodation. Some other towns didn't have accommodation, so I had to sleep in other towns, to only travel to my intended locations in the morning. I travelled about 3 800 kms to all the libraries. Secondly, the interview questions were written in English and I also had intended to conduct them in English, but many respondents felt that they much preferred to answer the question in other languages. The interviews were scheduled to take one hour but that was going to be a challenge because all the question had to be translated from English to Sesotho.

Thirdly, one library is not operating due to the fact that there was no electricity. The entire staff members were working at another library. I had made some arrangements three weeks prior to my visit, and made a follow up because I was coming from far, but nobody informed me about the changes. I knew I could not go to that library, so I eliminated the library from my study because I couldn't get library users or community leaders. It was a fruitless expenditure from my side. Another challenge experienced during data collection was the fact that many of the libraries did not have water at all. Therefore, library officials denied the users access to use the toilets because of that reason. It was evident that the challenge of shortage of water in most of these libraries were linked to the municipal services problems. During the process I got sick due to not having access to water I had to look for the clinic so that they can prescribe medication for me before I can go to the guest house.

In conclusion, everybody was now talking and panicking about coronavirus pandemic and there was a strong rumour that the libraries may be closed to avoid the spread of it. I was also becoming worried that this is going to affect my data collection planning.

5.10 Data analysis

Data analysis is the process of organising, structuring and bringing to order the meaning of data collected (Marshall & Rossman 2015). According to Best and Kahn (2006:354), data analysis and interpretation “represent the application of deductive and inductive logic to the research”. The main purpose of data analysis is to attain useful and usable information. Data analysis, regardless of whether is quantitative or qualitative, and may:

- (i) Identify the difference between variables
- (ii) Compare variables
- (iii) Describe and summarise data
- (iv) Identify relationships between variables

Two theoretical traditions, namely, positivist and interpretivist are linked with various approaches, namely, qualitative and quantitative data. Interpretivist is linked with analysis of qualitative data, while positivist is linked with analysis of quantitative data. This study adopted two different analytical methods which were quantitative and qualitative data. Social Science research utilize two statistical tools during analysis of data, in which according to Ngulube (2005) are called descriptive and inferential statistics. Moreover, Ngulube (2005) explains that descriptive statistics can be utilized further to describe characteristics of a population, while inferential can describe characteristics of a phenomenon based on parameters.

5.10.1 Quantitative data

The quantitative data was analysed using factor analysis, an approach that conforms to expectation in emergence of knowledge commons, and also data that was collected with the guide of the IAD framework (Ostrom 2007). The quantitative data was analysed using descriptive statistics as well as nonlinear factor analysis approaches, after the data was prepared, screened for errors and cleaned. The inferential statistical analysis focussed on testing the hypotheses stated for the study.

- (i) Data preparation

Coding of the data was performed alongside data collection, through assigning a number or a code to each of the variables (Denscombe 2010; Neuman 2006). The data preparation and subsequent

analyses were undertaken using versions of Statistical Package for the Social Sciences (SPSS) 22 and Analysis of a Moment Structures (AMOS) 23. The data was entered into SPSS version 22 spreadsheet and then screened, cleaned and labelled. Screening and cleaning of data involves identifying and modifying of coding errors and checking for discrepancies in responses where they exist, and then addressing the issue of missing data (Burton 2004; Neuman 2006). Through various compromises of data preparation, measurements, formal hypotheses construction, sampling among others, application of multivariate analytical system to psychological data has been made very possible.

In this research, 74 variables were involved, minus demographic characteristics and questions with binary or other response types that do not conform to the assumptions of data reduction. The researchers used Principal Component Analysis (PCA) to achieve this end. Principal Component Analysis is one of the oldest and most widely used techniques to reduce the dimensionality of datasets; the outcome of the reduction is a new dataset that retains much of the statistical information (or variability), in the original dataset. PCA identifies the principal components, or fewer new variables, which represent maximal variation in the original dataset. The new variables are linear functions of those variables in the original dataset, but the new variables themselves are uncorrelated with each other in order to be good candidates for multivariate analysis. Jolliffe (2002:106) has supplied a definition that captures the key assumptions of PCA: “The original purpose of PCA was to reduce a large number (p) of variables to a much smaller number (m) of PCs whilst retaining as much as possible of the variation in the p original variables. The technique is especially useful if $m \leq p$ and if the m principal components can be readily interpreted.”

PCA is very important in the social sciences where large datasets often contain multiple inter-correlated (similar) variables, and the value of some of the data items may be better deduced from one or more other data items in the same dataset. According to Jolliffe and Cadima (2016), the history of PCA dates back to Pearson (1901) and Hotelling (1933), but PCA did not blossom until electronic computers and software packages that are capable of facilitating the decomposing of non-trivial statistical problems became widespread. PCA is a descriptive tool and does not need to conform to distributional assumptions; the multivariate normal (Gaussian) distribution of the

dataset is rather often assumed. PCA is therefore a very adaptive and exploratory technique (Jolliffe 2002).

How does PCA work? PCA first isolates the common variance shared by all the variables in the original data set. PCA also isolates the variance which each of the variables in the dataset shares with each of the variables - this is known as communality. The first principal component would often account for the largest variability in the original set of variables, while each succeeding component would account for some of the remaining variability in the data set as well as the variances of the principal components or Eigenvalues. PCA also isolates the correlation between each of the original variables and the factors, often known as factor loadings.

To test a set of data for suitability for PCA, Kaiser Meyer Olkin (KMO) and Bartlett's Test of Sphericity (BTS) are usually applied to confirm if the items were appropriate factors based on the variances. According to Hair, Black, Babin and Anderson (2010), VTS test of variation of factors is measured from 0.000 to 1.0 and the overall value of KMO should be 0.60 or higher to carry on with PCA. Bartlett's Test of Sphericity test relates to the validity and suitability of the responses to the questions being addressed, by way of testing the overall significance of all the correlations in the correlation matrix. Usually, the BTS is measured using a Chi Square test, and the null hypothesis that the correlation matrix is an identity matrix, that is, the responses are not valid, and, not suitable, must be rejected ($p=0.000$) for PCA to be conducted. The researcher conducted dimensionality reduction in this research for all the categories of the variables. For the purpose of detail, all the critical elements in the data analysis processes were either described or displayed in tables. Data preparation was undertaken in two phases.

Data preparation took the form of subjecting the entire set of data to test using CFA factor analysis, an approach that conforms to emergence, enabling the researcher to see things that were barely visible. Data collected with the guide of the IAD framework (Ostrom 2007), which contains pre-selected and author defined variables. The task of the researcher is to unravel the underlying structure of the latent constructs in the observed variables without imposing a preconceived structure (Child 1990). According to Diana (2006:2),

Confirmatory factor analysis (CFA) is a statistical technique used to verify the factor structure of a set of observed variables. CFA allows the researcher to test the hypothesis that a relationship between observed variables and their underlying latent constructs exists. The researcher uses knowledge of the theory, empirical research, or both, postulates the relationship pattern a priori and then tests the hypothesis statistically (Diana 2006:2).

The researcher deployed the IAD theory and defined variables that guided data collected to postulate the pattern of the relationship a priori, and then tested the emerging hypotheses statistically. To achieve this all the relevant variables in the questionnaire as shown in Table 5.7 were included. It should be pointed out that all open-ended questions did not go into the CFA complex. The demographic characteristics of the respondents were also excluded from the CFA system. Each of the categories of variables in this study constitutes the latent constructs, and contains multiple labels.

Table 5.7: The variables in the CFA analysis

Label	Items
About open access	10.1 Open access is freely available in commons
	10.2 Knowledge published is enclosed in the commons in the library
	10.3 Open access resources often apply copyright restrictions
	10.4 Knowledge increases and spreads best when there are no restrictions to access
	10.5 Open access has a greater research impact for students and or library users
	10.6 Education resources must be published with open licenses
	10.7 Open access resources supplement online library materials
	10.8 Access to electronic resources is clear in terms of intellectual property rights to no intellectual property rights in the commons
Social and material resources in the commons	12.1 The space has all the digital resources I require
	12.2 I can meet people I learn from
	12.3 The level of interaction among users of the space is very useful to me
	12.4 I have the liberty to influence others positively
	12.5 I meet those that influence me positively
	12.6 I have met people that are disgusting to me in the space
	12.7 The supportive role of the commons staff is very helpful
	12.8 I have at one time or the other acquired some digital resources such as software from colleagues I met in the commons
	12.9 I have acquired some digital skills from some people I have met in the commons
Digital literacy	15.1 The commons is already fast-tracking digital literacy

	15.2 The commons may fast-track digital literacy in the future
	15.3 The commons is a distraction to digital literacy
	15.4 I am yet to address my mind to this kind of issue
Creative competences	16.1 Use of digital technologies
	16.2 Use of free and open access resources
	16.3 Use of FOSS (Free and open-source software)
	16.4 Use of social media
	16.5 Use of Internet
	16.6 Other literacy, not necessarily digital
Meanings users give the commons	17.1 The commons is a place to make friends
	17.2 The commons is a place to meet people who may assist one solve learning and related problems
	17.3 The commons is a place to pass time
	17.4 The commons is a place to engage in self-directed learning
	17.5 The commons is a distraction to normal library services
Physical/observable items	18.1 Articles
	18.2 Books
	18.3 Web pages
	18.4 Computers, tablets or online games
	18.5 People
Attractive content	19.1 Internet
	19.2 Social media
	19.3 ProLib library system
	19.4 Online Public Access Catalog (OPAC) - stand-alone online bibliography of a library collection that is available to the public
	19.5 Overdrive (library e-books)
	19.6 Press Reader - digital newspaper and magazine
Roles of users	20.1 Accessing the library websites/ library system (ProLib)
	20.2 Knowledge from electronic documents
	20.3 Education – computer classes
	20.4 Digital experience – online gaming
	20.5 Communication – accessing of personal emails
Contribution of resources	21.1 I come to the commons to use the resources already existing in the space
	21.2 I periodically provide resources required to make the commons rich
	21.3 I periodically provide policy ideas to the library regarding how to move the commons forward
Rules and regulations	22.1 Making rules for day-to-day operations of the commons
	22.2 One of the individuals that interact to decide the operational rules
	22.3 One of the groups that define who may participate in making collective choices
Awareness about rights	23.1 Who may access the commons,
	23.2 Who should contribute to the commons,
	23.3 Who could extract or remove content from the commons,
	23.4 Who should manage the commons,

	23.5 Who could exclude others from accessing the commons,
	23.6 Who has the right to sell or lease content from the commons
Quality and equality	27.1 Increasing the amount and quality of scientific knowledge;
	27.2 Maintaining the sustainability and preservation of the commons;
	27.3 Building standards that lead to high levels of participation in the commons;
	27.4 Ensuring the economic efficiency of the commons;
	27.5 Applying fair standards in the sense that all individuals benefit equally from their contributions;
	27.6 Working towards equality in the commons by redistributing resources to poorer individuals
Sustainability	29.1 The commons is sustainable
	29.2 The commons increase the amount of high-quality scholarship
	29.3 The commons promotes equality among users

(ii) Data reduction using PCM

The thesis examined the adequacy of the sample from which the data for the study was collected. Usually, this is satisfactorily measured by KMO Test in SPSS version 22. The sample is considered adequate when the value of KMO is larger than 0.5 (Field 2000). Some authors such as Pallant (2013) have suggested that the benchmark should be 0.6 and above. The originator of the test, Kaiser (1974) recommended that a minimum of 0.5, and values between 0.5 and 0.7 should be considered mediocre, while value between 0.7 and 0.8 are good and those between 0.8 and 0.9 are great. Values between 0.9 and above are superb according to (Hutcheson & Sofroniou 1999). KMO test is often carried out along Bartlett Test of Sphericity (BTS). BTS is used to measure the strength of the relationship among the variables. It is usually referred to as a measure of multivariate normality of a given set of distribution. By inference, BTS also checks the null hypotheses that often state that the original correlation matrix is an identity matrix. If the significance value is less than 0.05, then the dataset does not produce an identity matrix and is then approximately multivariate normal and acceptable for further analysis (Field 2000; Pallant 2013). Table 5.8 shows that the KMO measure of sampling adequacy test for the sample in this study accounted for 79%, higher than the 60% threshold (Hair et al 2010), showing that the sample is adequate. Bartlett's test of sphericity was significant ($\chi^2(2628) = 6435.326, p=0.000$).

Table 5.8: KMO and Bartlett's Tests

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.790
Bartlett's Test of Sphericity	Approx. Chi-Square	6435.326

	Df	2628
	Sig.	0.000

Hence, the correlation matrix is not an identity type, and is suitable for further deployment for higher statistical analysis.

(iii) Communality

Communality represents the proportion of each variable's variance that can be explained by the factors. It is the same as the sum of the squared factor loadings for each of the variables. Values range between 0 and 1 and those values closer to 1 suggest that extracted factors explain more of the variance of an individual item. Table 5.9 show the communalities for the variables. The descending order of the communalities reflects the pattern of sufficient common variation of each of the variables to be retained in the factor solution. The tables show the communalities for each of the 74 variables in descending order of their magnitudes. “Applying fair standards in the sense that all individuals benefit equally from their contributions” has the highest communality, $h^2=0.801$. “Maintaining the sustainability and preservation of the commons” has the next highest communality $h^2=0.795$. The variable with the least communality is “Knowledge published is enclosed in the commons in the library”.

Table 5.9: Communalities

	Initial	Extraction
Q27.5 Applying fair standards in the sense that all individuals benefit equally from their contributions	1.000	.801
Q27.2 Maintaining the sustainability and preservation of the commons	1.000	.790
Q27.3 Building standards that lead to high levels of participation in the commons	1.000	.790
Q23.3 Awareness of rule of extracting or removing content from the commons	1.000	.785
Q27.4 Ensuring the economic efficiency of the commons	1.000	.777
Q19.6 Press Reader	1.000	.775
Q23.6 Awareness of rule of selling or leasing content from the commons	1.000	.771
Q22.2 One of the individuals that interact to decide the operational rules	1.000	.769
Q23.2 Awareness of rule of contributing to the commons	1.000	.769
Q23.1 Awareness of rule of accessing the commons	1.000	.768
Q27.1 Increasing the amount and quality of scientific knowledge	1.000	.766

Q26 Requisition to donate tangible or intangible resources to the library	1.000	.761
Q12.6 Met people that are disgusting to me in the space	1.000	.760
Q20.2 Knowledge from electronic documents	1.000	.757
Q16.4 Use of social media	1.000	.749
Q12.9 Acquired some digital skills	1.000	.748
Q19.1 Internet	1.000	.743
Q10.8 Access to electronic resources is clear in terms of intellectual property	1.000	.742
Q12.3 Interaction among users is very useful to me	1.000	.741
Q16.3 Use of FOSS (Free and open-source software)	1.000	.741
Q27.6 Working towards equality in the commons by redistributing resources to poorer individuals	1.000	.741
Q10.7 Open access resources supplement online library materials	1.000	.739
Q16.5 Use of internet	1.000	.736
Q18.4 Computers, tablets or online games	1.000	.734
Q19.2 Social media	1.000	.733
Q15.3 Commons is a distraction to digital literacy	1.000	.731
Q16.6 Other literacy, not necessarily digital	1.000	.731
Q17.3 Commons is a place to pass time	1.000	.730
Q22.1 Making rules for day-to-day operations of the commons	1.000	.729
Q18.1 Articles	1.000	.726
Q10.6 Education resources must be published with open licenses	1.000	.725
Q12.2 Meet people that I can learn from	1.000	.724
Q10.3 Open access resources often apply copyright restrictions	1.000	.720
Q18.2 Books	1.000	.719
Q28 Assessing the level of participation in the commons in your library	1.000	.716
Q19.4 Online Public Access Catalogue (OPAC)	1.000	.712
Q24 Provision of incentives to encourage and facilitate participation in using and making rules in the commons	1.000	.708
Q17.5 Commons is a distraction to normal library services	1.000	.705
Q19.5 Overdrive	1.000	.705
Q12.8 Acquired some digital resources	1.000	.704
Q23 5 Awareness of rule of excluding others from accessing the commons	1.000	.704
Q17.4 Commons is a place to engage in self-directed learning	1.000	.703
Q20.5 Accessing of personal emails	1.000	.702
Q15.2 Commons may fast-track digital literacy in the future	1.000	.699
Q15.1 Commons is already fast-tracking digital literacy	1.000	.698
Q16.1 Use of digital technologies	1.000	.698
Q29.3 The commons promotes equality among users	1.000	.697
Q29.2 The commons increase the amount of high-quality scholarship	1.000	.692
Q10.1 Open access is freely available in commons	1.000	.689
Q12.1 Space has all digital resources I require	1.000	.689

Q20.3 Computer classes	1.000	.688
Q23.4 Awareness of rule of managing the commons	1.000	.686

Table 5.9: Communalities cont.

Q22.3 One of the groups that define who may participate in making collective choices	1.000	.685
Q29.1 The commons is sustainable	1.000	.684
Q12.5 Meet those that influence me positively	1.000	.682
Q21.1 I come to the commons to use the resources already existing in the space	1.000	.676
Q19.3 ProLib Library system	1.000	.673
Q17.2 Commons is a place to meet people who may assist one solve learning and related problems	1.000	.670
Q12.4 Liberty to influence others positively	1.000	.669
Q16.2 Use of free and open access resources	1.000	.667
Q20.4 Online gaming	1.000	.665
Q10.2 Knowledge published is enclosed in the commons in the library	1.000	.664
Q10.5 Open access has a greater research impact for students and/or library users	1.000	.657
Q18.3 Web pages	1.000	.653
Q20.1 Accessing the library websites/ library system (ProLib)	1.000	.648
Q21.3 I periodically provide policy ideas to the library regarding how to move the commons forward	1.000	.647
Q25 Requisition to supply resources to the library for public use	1.000	.641
Q15.4 I am yet to address my mind to this kind of issue	1.000	.637
Q17.1 Commons is a place to make friends	1.000	.632
Q18.5 People	1.000	.621
Q21.2 I periodically provide resources required to make the commons rich	1.000	.608
Q12.7 Supportive role of the commons staff is very helpful	1.000	.603
Q10 4 Knowledge published is enclosed in the commons in the library	1.000	.531
Extraction Method: PCA.		

Even the weakest variables in this system ‘Knowledge published is enclosed in the commons in the library’ ($h^2=0.531$) has a sufficiently high communality to be a good candidate for higher statistical analysis. How then do we deploy the variables in the statistical system to achieve a reliable analysis? The next subsection addresses this question.

(iv) Total Variance Explained

Total variance explained refers to the proportion of variables that a mathematical model will be able to account for their variation. This process reduces the number of variables that will go into the analysis. Table 5.10 shows that the model 10 of the 74 variables explained 65.20% of the entire

variation; the rest of the variables explain small variations and will therefore add little or nothing to the analysis.

Table 5.10: Total variance explained

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.852	28.219	28.219	4.662	11.100	11.100
2	3.379	8.046	36.264	3.900	9.285	20.384
3	2.393	5.697	41.962	3.802	9.052	29.436
4	1.902	4.529	46.491	2.819	6.713	36.149
5	1.660	3.952	50.443	2.464	5.867	42.016
6	1.466	3.490	53.932	2.296	5.467	47.482
7	1.389	3.306	57.239	2.146	5.110	52.592
8	1.225	2.918	60.157	1.968	4.686	57.278
9	1.090	2.594	62.751	1.934	4.604	61.882
10	1.050	2.499	65.250	1.415	3.368	65.250

Extraction Method: PCA.

So far, this analysis has revealed that only ten of the variables are suitable variable-candidates for further analysis, and will therefore be used for the CFA and SEM.

(v) First level statistical analysis

In order to glean the structure of the responses to the questions, the researcher used frequency distributions to describe the result at a first level of analysis. Frequency distributions deliver sufficient first level information to understand the situation as is, and to then decide what further analysis would be carried out to address the research problem further.

(vi) Inferential statistics

Inferential statistics are often discussed from two major perspectives: parametric and non-parametric. After data preparation in SPSS version 22 and AMOS version 23 were used to achieve structural equation modeling (SEM). SEM is effective in establishing causal relationships among variables in a research model and to address the six hypotheses stated in Chapter One. Specifically, Maximum Likelihood method was applied to calculate estimates for regression weights, variances, covariance and correlations.

The adoption of SEM in this study was motivated by the nature of the model developed for this research. The measurement model was assessed first using CFA, and then the structural model assessment. The model fit was assessed based on Kline (2005) recommendation that model chi-square, RMSEA, 90% confidence interval for RMSEA, CFI, and SRMR be reported and that “RMSEA \leq 0.05 suggests close approximate fit, values between 0.05 and 0.08 indicate reasonable error of approximation, and RMSEA \geq 0.10 suggests poor fit” (Kline 2005:139). CFI “greater than roughly 0.90 may suggest reasonably good fit of the researcher’s model” and SRMR values “less than 0.10 are generally considered favourable” (Kline 2005:140-141).

(vii) Model Assessment with CFA

The researcher used a two-stage modelling to assess the measurement models, and then assess the whole of the structural model. When one is conducting SEM, the practice is that the measurement models should be assessed first, using confirmatory factor analysis in order to validate the construct (Morrison et al 2014). Construct validity is the degree to which an instrument, for instance, the questionnaire in this case, measures the constructs for which it was designed (Alumran et al 2014). This was done here using CFA. Confirmatory Factor Analysis is a unique form of factor analysis. It is used to confirm whether the measures of a given construct are in consistency with the understanding of the researcher about the nature of that construct. Usually, measurement model of a latent construct must pass through CFA before it can be used to model in SEM.

According to Awang (2015:54), SEM is a confirmatory method that provides a comprehensive means for validating the measurement model of latent constructs. The Confirmatory Factor Analysis method can successfully assess the one-dimensionality, validity and reliability of a latent construct. The researcher needs to perform CFA for all latent constructs involved in the study before modeling their inter-relationship in a structural regression model (Kline 2011). Confirmatory Factor Analysis is an extension of factor analysis in which specific hypotheses about the structure of the factor loadings and intercorrelations are tested. Confirmatory Factor Analysis measurement models focus on the link between the latent factors and their observed variables. Structural models depict the links between the latent variables.

5.11 Validity and reliability

Research study is valid when its conclusions are true and reliable. McMillan and Schumacher (2001: 167) refer to reliability as consistency of measurement, while, 'validity refers to the truth or falsity of propositions generated by research'. Therefore, it was important for a researcher to be vigilant about the reliability and validity of the findings of her work (Lynn & Powell 2010).

(i) Validity

Validity is defined as the extent to which the instrument measures what it purports to measure (Leedy & Ormond 2010). Using both national and international literature contributed to the validity during the review of empirical literature. The review of empirical literature served as guide towards the development and content of the questionnaire and interview questions. The use of open and close questions coded into themes also increased validity as it was based on participants' responses rather than themes created beforehand by the researcher. The response rate was as high as possible to increase the validity. To facilitate a high response rate, the respondents were contacted personally and followed up regularly.

5.11.1 Reliability analysis

In research, reliability tests consistency of measures. According to Mouton (2001), reliability is a measure of whether a measure actually skilfulness, applied repeatedly to the same object, would truly issue the principally same result each time. Bless, Higson-Smith and Kagee (2006) clarified that reliability refers to an instrument that yielded the stability scores because the reliable measure is one in which the scores remain the same (free error) over a few measuring points. In this study, reliability analysis was conducted by using SPSS version 22 data analysis for questions in the questionnaire for library users. McMillan and Schumacher (2001) indicate that there are various types of reliability, for example, Stability (test-retest), Equivalence test, Equivalence and Stability, Internal consistency split-half; Kuder-Richardson (K-R); Cronbach Alpha and Agreement.

McMillan and Schumacher (2001) describe that when correlating scores from the same test on two various instances of a group of individuals, or subjects being measured and the measuring

instrument continue exactly to be the same, a coefficient of stability is obtained. It is believed that many factors can influence the results of the study at different points in time. According to Terre Blanche et al (2006), this method can be used to measure how well a method defies these factors over time. The correlation between two equivalent versions of a test is measured by equivalence test. The researcher uses it when there are two different valuation instruments or sets of questions considered to measure the same thing (Bless et al 2006; McMillan & Schumacher 2001; Terre Blanche et al 2001). A reliability coefficient of equivalence and stability is established when a pre-test and post-test to measure a change in behaviour is needed, for instance, reliability data are obtained through the administration of the same group of individuals one form of a measuring tool at one time, while a second form at later stage (McMillan & Schumacher 2001).

This study used internal consistency form of measuring the reliability of the questionnaire for library users. The internal consistency form was used to assess the correlation between multiple items in a test that are intended to assess the same concept. The researcher used one data set to calculate internal consistency without repeating the test. According to McMillan and Schumacher (2001:246), internal consistency is the “most common type of reliability since it can be estimated from giving one form of a test once”. There are three common types of internal consistency: split-half, Kuder-Richardson (K-R), and the Cronbach Alpha method (Bless et al 2006; De Vos et al 2011; McMillan & Schumacher 2001). Cronbach Alpha was used to assess the internal consistency of a questionnaire for library users that was made up of multiple Likert-type scales and items that were numbered accordingly thus the results of odd numbers were equalled to the results of even numbers. Table 5.11 shows reliability of the constructs under comparable conditions.

Table 5.11: Reliability analysis results

	Number of items	Cronbach items
Developments in respect of access to knowledge published in the electronic spaces	8	0.704
The social and material resources of the commons support diverse information and other engagement necessary to stimulate learning	9	0.773
People and material resources and identifications with digital literacy	4	0.601

Kinds of digital literacy skills and creative competences do commons participants develop through their participation in the use of the space	6	0.783
The meanings and motivations users attach to their engagement in the commons	5	0.642
Physical or observable items that constitute a major attraction in the commons	6	0.857
Success in the commons	6	0.846

The results presented in Table 5.11 shows a score of over 0.6 for high internal consistency. In this instance, alpha value is satisfactory when reliability coefficient demonstrates scores between (0.58–0.97) and is considered acceptable in social sciences using the Cronbach Alpha (De Vos et al 2011).

5.12 Synthesis of the chapter

Chapter Five presented research methodologies used in this study to examine the emergence of knowledge commons in nine public libraries in the Thabo Mofutsanyana District. Philosophical assumptions, research paradigms, research approach, and research design that the researcher adopted were discussed. The target population, sampling frame, sampling size, and selecting specific data collection were well defined. Furthermore, instrumentation such as pre-testing the questionnaires guide was also covered. Data collection instruments and methods described the questionnaire and interview schedules. This chapter also discussed the administration of the instruments and the report of the field work. To conclude, data analysis used in this study, ethical consideration, validity and reliability were also covered. The next chapter will present the qualitative results.

CHAPTER SIX

PRESENTATION AND ANALYSIS OF THE QUALITATIVE DATA

6.1 Introduction

The previous chapter analytically described the research methodological processes and techniques that were adopted to guide the study in order to answer the research questions. In addition, the significant areas presented and explained in Chapter Five among others, explained the philosophical assumptions, research paradigms, and research approach as well as research design of this study.

This chapter synthesized and reported the interviews with the community leaders (CLs) and library officials (LOs) who constituted the community leaders (CLs) in this study. The researcher first, analysed the background information of the CLs, and then the interviews were synthesized. An approach of aggregating similar opinions to questions, and then interpreting and describing them before divergent opinions, was adopted. It was deliberate to initiate the interviews with issues about open access Brown et al (2003) having made a clear connection between open access and the commons. The rest of the entire interview sessions focussed on Hess and Ostrom's IAD framework. The IAD as applied to knowledge commons starts with underlying situation that subsumes background environment and attributes of the commons, resources, community, objectives and history. Then followed by the action arena where issues about the action situation and actors were discussed. Finally, the interview addressed patterns of interaction and evaluation.

6.2 Background information of the interviewees - community leaders and library officials

Eight communities namely Bohlokong, Fateng Tse Ntsho, Leratswana, LS Sefatsa, Mashaeng, Meqheleng, Moemaneng and Petsana were represented by two CLs each, 16 in all. Seventeen by LOs represented nine communities that included Zamani, in addition to the eight already mentioned. The community leaders came from three municipalities including Dihlabeng (6 CLs), Nketoana (4 CLs) and Setsoto (6 CLs). The library officials came from four communities (6, 3, and 6) that included Phumelela (2). Three CLs from the respondents identified themselves as

Community Leaders, Professionals (3) Distinguished residents (9) and Other (1). The library officials identified themselves as Librarians (6), Assistant Librarians (4) and Library Assistants (7).

The background information requested from the interviewees included: name of library/community, name of the local municipality, identity of respondents, and description of roles in the libraries/communities. Information was also requested on age of respondents, how long they have been employed or associated with the library, gender, highest educational qualification, marital status, home language, and training of the library officials. The community leaders also supplied further information about their roles in the community and libraries.

The mean age of the community leaders was 30.28 years while the mean age of the LOs was 38.76 years. In respect of gender, 15 of the CLs were males while nine and eight of the LOs were males and females respectively. On the highest education of the respondents, Table 6.1 shows that equal number (4) of CLs and LOs have high school certificates or equivalent certificates and tertiary certificates.

Table 6.1: Highest educational qualification of respondents

	Community leaders		Library officials	
	Frequency	Percent	Frequency	Percent
High school certificate or equivalent certificate	4	25.0	4	23.5
Tertiary certificate	3	18.8	3	17.6
Diploma	4	25.0	8	47.1
Degree	5	31.3	2	11.8
Total	16	100.0	17	100.0

But (8) LOs than (4) CLs reported having diplomas. Ironically though, (5) more CLs than (2) LOs reported to have degrees. In addition to English, fourteen of the 16 CLs speak Southern Sesotho while 2 speak IsiZulu; for the LOs, 11 speak Southern Sesotho, 2 Setswana and 4 IsiZulu. All the interviewees were Blacks.

Out of the 16 CLs, 11 (68.8%) were single and have never been married/never lived together as husband/wife/partners while 5 (31.3%) were legally married (including customary, traditional, religious, civil, etc.). The situation is different with the LOs. Six were single and have never been married/never lived together as husband /wife/partners, legally married (including traditional, religious, civil, etc.) while one respondent each was separated but still legally married, divorced, or living together like husband and wife/partners. Regarding employment, five of the CLs reported that they were employed. Eight were unemployed while three were self-employed. The number of years of employment of the LOs range from 1-28 years, with number of employees in each number of years being unit except for three LOs that have spent 25 years on the job and two that have worked for 10 years. The community leaders have been associated with the libraries in the communities they represent for a period ranging from one to 10 years. Besides three CLs have been associated with the libraries for 10 years and two others for five years, the rest of the CLs have only been associated with the libraries for one year each.

The roles of the CLs in the community were diverse. The community leaders mainly assist members of the community in attending to their assignments and also help in encouraging members of the community to study and pursue their aspirations. According to the respondents:

As a tutor in the community, I help learners with their assignments, homework and previous question paper; Community and political leader who assist members of the community to access the internet in order to solve their personal challenges because the town is rural. Also, he provides legal and financial assistance to the community members; Community member assisting in community development programmes; I am a graduate from Central University of Technology and since I am unemployed, I assist learners with their homework; I am a guy who likes to encourage hopeless people to read and pursue their dreams; I am a leader in my church youth committee; I am a professional who is adamant about change in the community through information and knowledge; I am just a community member who is in involved in community development activities; I'm a Class Prefect at Tlokola Secondary School; In my community, I help the needy people; My role in the community is that I am an activist that supports small businesses with branding them; Protect my shared resources in the community such as clinic, library, schools, etc, and, Supporting community to any of their need and also participating in non-governmental organizations' activities.

Other respondents commented thus:

Assisting the library officials and the users with my knowledge where necessary, and participating in other activities which are beneficial to library; I am a community member that assists learners

who come to the library with their homework and love to interact with people a lot; I am a good library user who protects and live this library it is one of my assets; I am a library user, and on the other hand I assist users who need information on internet and I help learners with their homework; I facilitate extra classes for learners in order to help them with their school work, and also assist them in the knowledge commons; I'm a regular user using library because it is the only place where we can access and use internet free. I sometime assist other users with how to use internet or Linux to type their documents; My role is to help other library users to navigate information they want to access and be better scholars of the future. Regular library user who also helps other users with how to use computers and also offer with for example CV template from my personal flash/ memory stick; Research user who is trying to clarify how the library works and how people should use the spaces in the library; Researching materials for policy development; Student of UNISA using this library ever since I was a child. I am doing my research and studies here, and Studying, researching on Internet and reading for leisure only.

For the LOs, their roles vary. They provide support to the users in terms of library resources and management of the activities in the library. For a librarian:

We help users with lifelong education by providing them with access and support to use our library resources, I'm also managing issue desk; Manage information desk, shelf reading, organizing library activities, and marketing library using displays; Managing operational library activities according to both Dihlabeng municipal and Free State provincial structures; My role is to make sure every user is satisfied when they leave the library; I manage information desk, shelf read, and assist users with internet search, make copies and scan documents for community; My roles in the library is to train the users on how to access library commons like computers and provide the relevant sources where necessary or always; Planning and coordinating the management of the library, managing the financial responsibilities; To perform administrative duties, render professional library and information services to the community and to manage financial responsibilities of the library, and To plan and coordinate the services and activities, to establish community structures for consultation, manage the financial responsibilities of the library, performing administrative duties and also to render professional service to the community.

Six of the LOs had training on use of ICT in the libraries while three have trained on open access and four participated in both. Twelve of the LOs had formal training while one person's training was reportedly informal.

The library officials elaborated on their trainings:

As the person in charge of the library, I attended all the trainings based on Southern African Bibliographic Information Network (SABINET), ICTs and toy library; Enhancing and empowering officials about how to use the ICTs equipment and also be in the position to assist users; I attended training on open access so that I can assist users with knowledge published.

I received training on how to use computers, tablets, and search on internet; I received training on open access from SABINET and ICTs resources so that I can be in the position to assist users; I was trained on how to use ICTs equipment and also on how to assist users who utilize them; The training was about how to access database or knowledge published online on SABINET; The training was to ensure that we serve professional services to users regarding ICTs, and also to train users with basic digital literacy and digital creative skills; Toy library training on how to play with educational toys with children, SABINET training on open access and ICT training so that I can be able to assist users; Training empowered me to become a knowledgeable official who assist users with digital resources, and Training was based on open access, so that I can be able to assist users on knowledge published materials online.

6.3 A synthesis of the interview sessions with community leaders

This section presents findings of the collected qualitative data. Themes were used as sub-titled under which the findings are collected and presented. What follows is a synthesis of the interview sessions with CLs and LOs. In line with the undertaking to treat collected data confidential and respondents anonymous, respondents were referred to as CL-1 to CL-16 for community leaders and LO-1 to LO-17 for library officials, in no particular order.

6.4 Open access and knowledge commons

6.4.1 The prevailing openness in the libraries

In respect of the current openness practices in the libraries in which information resources are freely made available through the internet, majority of the respondents were regular users of the commons, and they relied on online resources for their learning. They also expressed happiness with openness practices as well as the expansion in the spaces and services offered by the libraries. There was a relative consensus that the libraries have improved and/or developed in terms of making internet access available for library users. However, respondent CL-3 preferred printed books, although he observed that many learners/students who came to the commons appeared to prefer online publications, and he felt that there must be a balance in the provision of print and online resources. The respondents CL-10 and CL-14 expressed full support for IPR, upholding the restriction and associated requirements for access of publications such as subscription fees. Similarly, respondent CL-13 reported that the library should only serve users with open access

online publications only, and that the library should avoid completely publications that require subscription fees.

6.4.2 Level of awareness about open access and associated developments

The respondents were asked to indicate their level of awareness about open access and other associated development. Half of the Community Leaders reported being very confident and positive on awareness about open access and associated developments, and how they play out in their libraries. The respondents CL-9 and CL-13 also expressed confidence but they also informed that training of other users would be favourable. Five of the respondents expressed uncertainty, but observed that training is required to improve their knowledge about IPR and open access issues. For CL-8, his level of awareness was low, indicating that the library has not done enough to make users aware about open access.

6.4.3 Systems/strategies to be installed or implemented to support and promote open access in the library

The study sought to know the opinions of the community leaders on the systems/strategies to be installed or implemented to support and promote open access in the library. The respondents strongly suggested that subscription and license fees of relevant resources in the library should be free of charge for users. Providing capacity building in forms of training and workshops to the users were suggested. Also, marketing and networking should be prioritised by the libraries, and the libraries should conduct community needs analyses and host open days in order to inform and train the students and users. The case of library PCs not to be allowed for personal use and recreation, but rather for academic purposes, was the concern of respondent CL-10. Free Wi-Fi to be made available to enable users make use of their own smartphones, laptops and tablets was the suggestion of respondent CL-11.

6.4.4 Training on open access in the past five years

In terms of the relevant training received in the past five years, eight of the 17 LOs stated that they had not received any relevant training on open access in the last five years. However, seven of those interviewed agreed that they have received relevant training on open access in the last five years. Respondents LO-11 and LO-15 stated that they had received a certain number of training, but not all the training required.

6.4.5 Disposition towards the open access philosophy

On character toward the open access philosophy in their public libraries, majority of the respondents seemed to feel that open access was a positive reinforcement to the information available at the library and was sufficient. However, respondent LO-1, 4 and 7 reported that they felt it unfair that restricted materials were not made available to students who needed it, despite them acknowledging the importance of IPR.

6.4.6 The development of open access model of knowledge access

The study sought to know the development of open access model of knowledge access. The LOs considered the commons as an appropriate response to the development of the open access model of knowledge access.

6.4.7 The open access environment in the library

The LOs were asked to describe the open access environment in their respective libraries. Majority of the LOs said that the open access environment was positive, favourable and conducive. However, LO-15 reported that the open access environment is not yet conducive due to the lack of free internet (Wi-Fi) and lack of human resources. However, four of them argued that the open access environments in their respective libraries were good but still restricted.

6.4.8 Open access policies, statements or positions of the library

On information concerning open access policies, statements or positions of the library, majority of the LOs stated that their library had no known policy on open access. According to respondent LO-4 there were no policies but only rules created internally. Respondent LO-15 was unsure about the existence of open access policies, and respondent LO-17 stated that library officials usually refer commons users to open access publications where necessary.

6.5 Biophysical conditions

6.5.1 Adaption of global transformation in the library

On how the libraries have conformed to the global transformation of creating spaces where library users can freely interact with information resources, nearly half of the respondents reported that the libraries have successfully adapted to the global transformation, and that the advances have been satisfactory. Eight of the CLs reported that their libraries are still in the process of adapting to the global transformation, but that they have not yet reached that high standard successfully.

6.5.2 Recent transformation in the library

Respondents were asked how the recent transformations in the libraries appear to have enabled the libraries to meet their information needs better than before. In terms of space, few of the respondents mentioned that library space has improved and has made enough room to accommodate a number of users simultaneously. Further, other respondents stated that there are changes being made and that book circulation is increasing. They however complained that internet speed in other libraries has slowed greatly, despite the fact that the information needs of the community are being met. A respondent felt that the needs of the community are being met to an appreciable extent.

The community leaders provided more insights. Most of them reported that they were able to gain further detailed information on important subjects via the internet on the library computers. A respondent who is also an unemployed graduate reported that the youth in his community has

nothing to do after school and thus the crime rate is fairly high, and that he uses the library for self-development. However, some respondents had contrary opinions as they expressed their frustration on the inability of the library officials to offer help. They also reported that there are not enough library toys and computers. They also stated that the library hall was used for social development activities. A respondent raised a concern about people living with disabilities not benefiting in the commons due to lack of special services. Additionally, there were some respondents who reported availability of open access internet and information sharing. They reported that their community is well-covered in terms of information availability for research purposes.

6.5.3 Aspects that negate expected roles of the library

The community leaders were asked whether they thought the ongoing transformations in the libraries were generally beneficial or if they thought there were some aspects of these changes that excluded their expectations of the library's roles. Majority of the respondents felt that there were both benefits and areas requiring improvement. In terms of the ongoing transformations in their respective libraries, they reported that changes were beneficial to both students and learners. Citing that computers provide better assistance than books and that despite legal operating hours, the library would remain open for use even on Saturdays. In the case of covering what was lacking from their respective libraries, five of the respondents had the opinion that some community members are not aware of library services being available. In some cases, there were expectations of government-sponsored library upgrades, workshops and training for community. They also stated that the expectation of children to be empowered academically by the libraries, and the expectation of more ICTs in the libraries should be addressed. The respondents also stated that there were not enough computers, nor tablets available in the libraries.

6.5.4 Observations, feelings, experiences and opinions about artefacts that exist in the library

The community leaders were asked to describe their observations, feelings, experiences and opinions about artefacts in the commons. Most of CLs reported that books and articles were always available, they however complained that some of the resources are not relevant or updated. Similarly, most of them observed that the number of computers with internet access and other

resources were not enough to accommodate the number of common users. In terms of the toy library, most of the CLs reported that resources were available. Most of the respondents noted that many tablets and photocopiers were either often broken or not available at all, and also that the Wi-Fi available was not free and that many websites were restricted, these hindering students and learners needing the info provided by those web sites.

The LOs were also asked a similar question and they reported that books, laptops, photocopiers, tablets, scanners, magazines, newspapers, journals, projectors and televisions were available. They also reported that Wi-Fi services was available but restricted.

6.5.5 Open access resources built by the library

The LOs were asked whether there were open access resources being built by the library. Three of the respondents reported that they have open access resources built by their libraries, where useful information was saved from the internet in a folder. They also reported that they had Linux free software and electronic manuals for community use. However, majority of the respondents reported that there was no open access being built or electronic manuals in their libraries.

6.5.6 Observations about facilities that store the artefacts and make them available

The community leaders were asked to describe their observations about facilities that store the artefacts and make them available, such as new forms of library spaces and computer network infrastructure in the library. According to eight of the CLs, the new space of the library accommodates community needs in terms of information availability, space, toy library facilities, and strategic location. Majority of the CLs reported otherwise, pointing out a number of areas in the libraries that needed improvement, including the library buildings without running water or toilet facilities, poor security systems and that there were many empty shelves but not enough space for learners to sit and work/study in. Two respondents stated that libraries have made an impact in the community and spaces are conducive even though they need to be designed strategically. Also, few respondents mentioned that libraries need to install security system to prevent possible burglary and they should also provide more library materials.

6.6 The commons community of the library

6.6.1 Support and role the community has provided, or played in the sustenance and maintenance of the library

The community leaders were asked on the role or assistance the community played in sustaining and maintaining the library. Majority of the respondents reported that the community does not provide any assistance to the library, except for one respondent who stated that Community Work Programme (CPW) workers were always cleaning and maintaining the library.

6.6.2 Amount of roles community can play together in view of the rapid transformations in the libraries

The respondents were asked how much of the roles the community would be able to play, in view of the rapid transformations in the libraries. Majority of the CLs were of the view that, if the members of their respective communities stood together and acted in unison, their libraries would be developed rapidly and effectively, especially in terms of the voicing of community opinions through suggestion boxes, digital transformations, the purchasing of new books and material and increasing the number of computers and/or tablets available. Other respondents felt that, in working together to protect and secure their libraries, communities will own the libraries, for all intents and purposes. However, respondent CL-6 pointed out that his community was passive in the affairs of the library.

Another respondent CL-8 suggested that management should initiate meeting with stakeholders in order to facilitate transformations and involvement of community. Four respondents recommended calling for donations either in monetary terms or data from communities and the authorities in order to improve the libraries in general.

6.7 Participating in making rules and regulations for the commons

6.7.1 Rules and regulations guiding the use of the space

Interviewees were requested to provide description of the rules and regulation guiding the use of the library commons, to which 12 of the 17 LOs stated that general rules were made visible to commons users and library officials in the library commons, specifically concerning noise levels, eating/drinking in the commons, littering, use of cell phones in the library, and age restrictions for toy library use. Half of the respondents noted the presence of rules in terms of library computer usage, concerning time limits, signing in/out, accessing of restricted sites, and food/water in proximity to the computers. A respondent stated that they also had rules concerning the borrowing of books while two respondents stated that he had never seen any rules written down or on display since arriving at the library.

6.7.2 Are the users involved in making the rules?

When asked whether or not the commons users were involved in making the rules in the library, almost all the LOs reported that commons users were not involved in making library rules or regulations.

6.7.3 Library policies

6.7.3.1 New library policies regarding managing the library in the event of the emergence of the commons

Regarding the new library policies in managing the library in the event of the emergence of the commons, most of the LOs stated that there had been no new policies. A respondent mentioned that policies are updated, such as new tariffs. Another respondent reported that she believes that the recent policy of no longer charging users for internet are used as a new policy indeed.

6.7.3.2 The policymakers

The respondents were asked who the policymakers are in their respective libraries, and whether or not any community members or library users were involved in the formation of policies. Majority of the LOs stated that Free State Department: Sport, Arts, Culture and Recreation was responsible for policy-making, and not the community members or users. Other respondents reported that either their employers, library officials and/or politicians were responsible for policy-formation, and not the community members or users.

6.7.3.3 The response and role of the community of users and policymakers in this new development

Responding to the question of the responses and roles of community users and policymakers, majority of LOs were of the opinion that good satisfaction and/or support levels were being experienced from the community. Some respondents stated that the community is restricted, and there were poor support/satisfaction levels from the community. Regarding support from Free State Department: Sport, Arts, Culture and Recreation, about seven of the respondents reported support received poor while eight respondents stated that they received sufficient support.

6.7.4 Intellectual Property Rights

6.7.4.1 Legal issues regarding IRP, subsidies, contracts, antitrust provisions

The respondents were asked whether or not any legal issues had been encountered on IPR, subsidies, contracts or antitrust provisions. Almost all the LOs stated that no legal issues had ever been encountered in the library. However, a respondent reported that the only legal-related issue was pertaining to users wanting to photocopy an entire book in the library.

6.7.4.2 Intellectual Property Rights in the emerging library model

When asked to what extent IPR had been taken into proper consideration in the emerging library model, almost all the LOs stated that library officials do take full consideration of IRP. A respondent however, stated that they did not train the users on IRP and Copyright Act.

6.7.4.3 Problems arise out of Intellectual Property Rights

On problems arising from IPR, majority of the LOs reported that the commons address such problems. However, two respondents reported that the problems concerning IPR are not addressed sometimes.

6.7.5 Governance in the commons

6.7.5.1 Do the commons impose any form of new governance system in the library?

The respondents were asked if the commons impose any form of new governance system in the library, majority of the LOs remarked that there were new governance systems in place commons imposed in their respective libraries.

6.7.5.2 Self-governance mechanisms

On the importance of self-governance mechanisms, the opinions of the LOs were sought especially on these areas; membership rules, resource contribution and extraction requirements, conflict resolution mechanism, monitoring rules, as well as sanctions for rule violation. Almost all the respondents confirmed that there are general rules or mechanisms in place in the commons, and that there are norms in place for conflict resolution. Majority of the respondents mentioned that commons users received explanation concerning membership rules, and also referred to suspension, reporting, fining and/or disciplining as consequences for sanctions for rule violation of the aforementioned rules. Also, more than half of the respondents stated that they were responsible for the monitoring of the commons, while five others pointed out that resource

contribution and extraction requirements were in place and made visible in their libraries and/or maintained by the Free State: Department: Sport, Arts, Culture and Recreation.

6.7.5.3 Any administrative and other costs of involved in constructing, monitoring and enforcing compliance with the rules installed to guide the use of the commons

Concerning whether or not there were any administrative and other costs involved in constructing, monitoring and enforcing compliance with the rules implemented for guidance in using the commons. Majority of the LOs stated that there are costs involved, however, three respondents stated that they have never encountered any such situations in the library.

6.7.6 Observations about how the practice norms, rules and laws that control management of commons

The respondents were asked to share their observations on how the practice norms, rules and laws controlling library service management had been influenced, majority of the CLs were of the opinion that the library norms, rules and laws have indeed been influenced in terms of needing to register for internet use, not being allowed to eat or drink in the library, not being allowed to loan books previously and also that previously existing norms, rules and laws have been negatively influenced because they are no longer properly enforced. In contrast, three respondents indicated that library laws, norms and rules have not been influenced or changed, in fact they are not made visible to users of the libraries.

6.7.7 What, if anything, would you change about norms, rules and laws if you could?

On the kind of changes regarding norms, rules and laws in the commons, majority of the LOs suggested that the rules and laws concerning interactions between library officials, as well as between library officials and commons users be changed and that there should be modification of norms, rules and laws in the library. They also suggested that there should be clear written library rules be placed at strategic places in the libraries and that changes to laws and rules pertaining to allowing permission for children to use the library on Saturdays for users who cannot visit the

library on weekdays be made. There should also be permit to eat in the activity hall, changes in the operating days and times and change the laws and rules concerning accessing of illicit or age-restricted materials in the libraries. They also suggested that the rules and laws pertaining to library officials training and improvement be revisited. They also want the rules to ensure that commons users are clean and hygienic when visiting the library and allowed to use the computers for one hour at a time instead of two, while others said they would make strict changes in terms of rules regarding noise levels in the library. Other respondents suggested that they should enforce changes regarding the rules and laws of the shelving and general library spacing and structuring, to create more space.

6.7.8 What would you recommend in respect of norms and rules that guided the use of the present-day library

The community leaders were asked for recommendations in terms of norms and rules that guide the use of the present-day library. Five respondents suggested that the library operating hours should be extended, and should include half-days on Saturdays. In terms of internal structuring, there should be stakeholder meetings with library officials and communities should be engaged more. Some of the respondents mentioned that the library must install a weapon-detection system to ensure the safety of all individuals within the library. They also recommended that there should be a rule that ensures that the officials are friendly. They also recommended that library officials be forbidden from cooking in the library.

6.8 Action arena

6.8.1 The antecedents of the commons in the library

The LOs were asked to provide background information on the commons. Most of the respondents stated that the library users were previously limited to the use of books and have since started using computers and internet, as well as DVDs and CDs. Also, two respondents affirmed that outside spaces would accommodate more users, and also that the establishment of the new commons has made it difficult for library officials to manage commons users, thereby making these library officials overworked.

6.8.2 Stories of the creation and operation of the commons in the library

The LOs interviewed were asked what the narratives of the creation and operation of the commons in the library. Majority of the respondents noted that the commons are now larger than in previous times. They also stated that computers have been added to the array of library facilities, and that the library services have changed to accommodate job seekers, letter writers and business people, among others. Other respondents stated that services now include training in CV-writing and general computer proficiency training. According to the respondents, the library is now a central information hub, serving the needs of everybody with projectors and toy library section added to the list in the libraries. Moreover, spacing, sections and room divisions were also reported. However, few of the respondents indicated that library operation hours were provided as narrative of the creation and operation of the commons.

Some of the respondents elaborated on the positive contribution of technology that commons have brought the digital age and advancement to the library through computers and internet access, while the majority of the respondents emphasized that assistance of commons users by library officials has also been mentioned improved.

6.8.3 Makerspaces

Findings from the study show that some of these nine participating libraries are having Makerspaces. Based on that factor, the LOs had been prompted to describe the Makerspace (if at all available) in each of their respective libraries and, according to all of them, no Makerspaces were available at their libraries. However, eight LOs pointed out that there were indeed Makerspaces in each of their respective libraries, referred to as Do-It-Yourself (DIY).

The LOs were also asked to indicate who is providing or supplying the resources to Makerspaces. Most of the respondents reported that resources in the Makerspaces were provided or supplied by community members and government departments.

6.8.4 Library human resources implications

The LOs were asked about the involvement and/or presence of sufficient human resources in the creation of the commons, and about how the library was responding to them. About six respondents stated that there were insufficient human resources available. About nine respondents noted that the human resources available in the commons is sufficient and that they operate well when working together.

6.8.5 Commons interfere with your performance given your knowledge and training

The LOs were asked how the commons interfered with each of their performances, given their knowledge and training. Majority of the respondents answered that the commons do indeed interfere in their performance and that more training is necessary. Contrastively, few respondents reported that they do not need training and that there is no interference with their performances.

6.8.6 How community of commons in the library accessible to and interconnected with related institutions and social practices

The LOs were also asked how the community of commons in their respective libraries is accessible to and interconnected with related institutions and social practices. Nearly all the respondents reported that the library has become a place of social interaction, where children and adults make friends and socialise, and also share information and resources with one another. On the other hand, few of the respondents stated that there was no real connection being made, and that children were usually the ones making connections.

6.8.7 The spectrum of participants in the commons in the libraries

On the spectrum of the participants in the commons in the libraries, among the more frequently mentioned groups were Africans, Whites, youth, students, school children and people with disability. Less frequently mentioned were elderly persons, adults, coloureds and foreign nationals. Five respondents pointed out that all people of all ages, races and communities were served in their

libraries. Religious groups, teachers and unemployed people were mentioned less frequently by certain respondents.

6.8.8 Do you consider that the commons in your library is growing since its inception?

When the LOs were asked whether or not they consider the commons in their respective libraries to be growing since their respective inceptions. The findings indicated that all the respondents answered positively.

6.8.9 Do you envisage that the commons will illuminate the normative foundations of library?

The LOs were asked whether they envisage that the commons might illuminate the normative foundations of their libraries, and all of them responded in the affirmative. According to the respondents, their problem was a depletion of data within a short period of time.

6.8.10 Points of conflicts between understanding of the library mission and the new development in the libraries

Majority of LOs reported that there were points of conflicts between the understandings of the library mission and the new development in their respective libraries. However, a respondent was not able to provide any feedback as he was uncertain as to whether or not there were any points of conflicts.

6.9 Incentives for participating in the commons

6.9.1 Incentives to promote the use of the commons

The Los were asked if their respective libraries provided any incentives or rewards to promote use of the commons. Majority of the LOs reported that there were no incentives they offered whatsoever in the commons. According to the respondents, free internet, competitions, award prizes and certificates are part of the incentives to promote the use of the commons in the libraries.

6.9.2 Incentives for participation in the commons

The LOs were also asked if their libraries offered any form of incentives to stimulate user participation in open access. Most of the respondents reported that incentives were in place in the commons to stimulate participation, including free access to knowledge, skills and information via the books and internet-connected computers, certificates and refreshments for children. Almost half of the respondents stated that no incentives were offered.

6.9.3 Teamwork among library users to create, or supply resources to the library to meet people's information need

On teamwork among library users to create or supply resources to the library to meet people's information need, majority of CLs agreed that there was teamwork between library officials and commons users. They also stated that the users protected their resources, and those violating the rules are reprimanded. Some of the respondents felt that there was no identifiable teamwork among community members and/or library officials, in their respective libraries.

6.9.4 Knowledge and information sharing among library users to mutually meet information needs of the library users

On knowledge and information sharing among library users to mutually meet information needs of the library users, majority of the CLs reported that knowledge and information was commonly shared among commons users and also among library officials and commons users to mutually meet the information needs. However, a respondent felt that there was no sharing of information at his library, especially among adults.

6.9.5 Compliance to library norms and regulations

This study sought to determine whether or not there was compliance to library norms and regulations in their respective libraries. Majority of the respondents reported that library rules,

norms and regulations were adhered to, while other respondents were of the opinion that there were some who comply, and some who do not comply with library rules and regulations.

6.9.6 Conflicts that arise in terms of resource sharing and other cooperative activities among library users

Regarding conflicts that arise in terms of resource sharing and other cooperative activities among library users, majority of the CLs were of the view that there was no conflict of in their respective libraries. About six respondents reported that there was a great deal of conflict on a regular basis, due to limited resources being available to large numbers of users.

6.10 Patterns of interaction

6.10.1 The patterns of interaction among patrons of the commons

Considering patterns of interaction, nearly half of the respondents admitted that there were problems and more than half of the respondents stated that some users solve their problems alone or amongst each other, and that others approach library officials for assistance. In addition, other respondents claimed that commons users, especially adults, tended to solve their problems on their own or amongst each other, but that sometimes children required assistance from officials.

6.10.2 Difficulties or challenges in the use of the library in view of the new changes

When asked to describe any difficulties or challenges experienced in their use of the library, in view of the new changes. Majority of the CLs reported the challenges and difficulties to include depletion of data, broken computers, air-conditioners, scanners, photocopiers, not enough computers to accommodate the number of commons users, absence of free Wi-Fi and the absence of Uninterruptible Power Supply (UPS) backup devices for load-shedding protection. Other challenges or difficulties were continuous change of software, lack of access of entrance to the facility during rain, unavailability of water in the library, life skills sessions for older people, and allocation of time to use the computers.

6.10.3 Benefits or advantages experienced in the use of the library in view of the new changes

In terms of benefits or advantages experienced in the use of the library, in view of the new changes majority of the respondents stated that they benefited largely from the changes in the library, in terms of gaining skills in different kinds of software, such Microsoft word, internet, emailing and other computer/technological skills. Few of the respondents stated that they benefited in general terms from the changes in the library, while few benefited by means of assisting many community members to access information via the internet.

6.11 Outcomes

6.11.1 Access and use of the commons in the library, and issues associated with inequality such as race, age and gender

Respondents were asked about racial, age-associated or gender-based issues of inequality in the commons, a respondent reported an equality issue where some adult users would want to be assisted before the children who were ahead of them on the queue, but that the issue was resolved. However, majority of the LOs reported that all commons users were treated equally, regardless of race, age, disability and gender.

6.11.2 The benefits of the commons, in terms of resources and who benefits

The LOs were requested to advise on what they felt the benefits are for the commons, in terms of resources. Respondents were also asked to what extent the commons facilitate the production of high-quality intellectual resources. All the respondents stated that both commons users and they benefited from the library's resources. Furthermore, they pointed out that equality is practiced for all commons users. Majority of the respondents stated that the commons facilitate the production of high-quality intellectual resources. While other respondents mentioned the value of open access, computer literacy and the supplementation of books with computers, was to the benefit of the commons users, and some reported that it was beneficial that the retrieval of more information was enabled, unnecessary work reduced, more knowledge acquired and new materials received while old materials were discarded. Regarding the issue of ensuring sustainability, majority of the

respondents stated that the District management sustains the commons. The respondents also reported that most of the cleaning and maintenance work is performed by CWP workers. They also stated that both library officials and community members also assist in cleaning and sustaining the commons.

6.12 Synthesis of the chapter

Chapter Six presented the findings of this study obtained through a qualitative research approach whereby data was collected through the use of interviews and thematic analysis in line with the objectives of this study. The main focus of this research was on the emerging knowledge commons in the nine participating Thabo Mofutsanyana District public libraries, in the Free State province. The main aspects addressed in this chapter were background information of the interviewees-community leaders and library officials of the participating libraries. This is followed by the synthesis of the interview sessions of both respondents' CLs and LOs. Furthermore, issues such as open access, attributes of commons, role of community, role of actors in the action arena which focused on the incentives received as a reward for participating and accessing the commons, rules that govern the commons, patterns of interaction emerging from the commons, and outcomes of these patterns of interactions were raised.

CHAPTER SEVEN

PRESENTATION AND ANALYSIS OF THE QUANTITATIVE DATA

7.1 Introduction

In Chapter Six, the thesis addressed the qualitative data collected through interviews, with the intention of showing the opinions and voices of the key informants. The key informants were the library officials and the community leaders. In this chapter, the essence is to present and interpret the quantitative data beginning with the first level data description, and a cross examination of the variables with demographic variables. Furthermore, the hypotheses are evaluated using advanced inferential statistical technique involving CFA and SEM.

7.2 Descriptive statistics

A total of 180 copies of the questionnaire were hand-delivered to library users in the nine public libraries in Thabo Mofutsanyana District. Out of a total of 180 copies of the questionnaire, 158 returned their copies, meaning that the response rate was 87.7%. The libraries Bohlokong, Moemaneng, Leratswana, Fateng Tse Ntsho, Zamani, LS Sefatsa and Mashaeng had the highest response rate – 12.7%, followed by 7.6% from Meqheleng public library, and Petsana public library with the lowest 3.8%. An overwhelming majority of the public libraries were situated in Dihlabeng Local Municipality with 38% followed by Setsoto Local Municipality with 32.9%, and Nketoana Local Municipality. The majority of respondents, 60.3%, were distinguished residents while professionals were 27.6%, followed by 7.7% community leaders, heads of institutions (3.8%) and other (0.6%).

7.2.1 Demographic profile of the library users

Table 7.1 shows that a high proportion of respondents between 25 and 34 years (33.3%), followed by those aged between 18 and 24 (30.1%). These were followed by those aged 35 and 44 (17.3%), 45 and 54 (12.8%), and from 54 years and above (6.4%).

$$\text{Mean} = \frac{\sum M=f}{\sum f} \qquad \text{Mean} = \frac{5241.5}{158} = 33.2 \text{ years}$$

The average age of the respondents was 33.2 years.

Table 7.1: Demographic profiles of library users

Variables	Measurement	Frequency	%
Age (years)	18 -24	47	30.1
	25 -34	52	33.3
	35 -44	27	17.3
	45 -54	20	12.8
	>54	10	6.4
Total		156	100
Gender	Male	94	59.9
	Female	62	39.5
	I would prefer not to comment	1	0.6
Total		157	100
Qualifications	Less than high school certificate	19	12.3
	High school certificate or equivalent certificate	84	54.2
	Tertiary certificate	15	9.7
	Diploma	20	12.9
	Degree	13	8.4
	Postgraduate degree	2	1.3
	No schooling	2	1.3
Total		155	100
Marital status	Single and have never been married/never lived together as husband/wife/partners	110	70.1
	Legally married	23	14.6
	Separated but still legally married	6	3.8
	Divorced	2	1.3
	Living together like husband and wife/partners	7	4.5
	Widowed	4	2.5
	Single, but have lived together with someone as husband/wife before	5	3.2
Total		157	100

According to Table 7.1, there were more males (59.9%) than females (39.5%) that responded, followed by 0.6% who preferred not to comment. In terms of qualification, most respondents (54.2%) had high school certificates or equivalent, while 12.9% had diploma. The respondents with high school certificates constituted 12.3%, tertiary certificate (9.7%), degree (8.4%), postgraduate degree (1.3%) and no schooling (1.3%). In terms of marital status, overwhelming majority of respondents, 70.1%, were single and have never been married/never lived together as husband and wife/partners (4.5%), followed by those who were separated but still legally married (3.8%), single, but have lived together with someone as husband/wife before (2.5%), widowed (2.5%) and divorced (1.3%).

7.2.2 Frequency of library usage

Table 7.2 shows that majority of the respondents (42.3%) have used the libraries for a period of 1 to 5 years, followed by those who have used the libraries between 6 to 10 years (35.5%), 11 to 15 (12.0%) and 21 to 25 (5.0%).

Table 7.2: Frequency of library usage

Number of years	N	%
1 – 5	67	42.3
6 – 10	56	35.5
11 – 15	19	12
16 – 20	7	4.4
21 – 25	8	5
26 – 30	1	0.6
	158	100
Mean	8.013	
Median	6.50	
Mode	5	

Also, 4.4% have used the libraries for a period of 16 to 20 years, and the lowest number of users, 0.6%, has used the library for 26 to 30 years. The mean number of library usage, in years, was 8.

7.2.3 Race of the Respondents

100% of the respondents were of Black African descent.

7.3 Open Access

7.3.1 Opinions of users about the commons in the library

A total of 67 respondents supplied responses to the open-ended question on their opinions, perceptions and feelings with respect to the recent development of the commons in the library. DCIPHER guided the extraction of five keywords that represented the responses. They are: Literacy, Library, Digital, Skills and Online. Digital was mentioned 19 times alongside literacy, digitization, skills and resources, while library and librarian was mentioned 12 times. Computer was mentioned 28 times, and this mention was associated with use, access and training, among others. When teased together, learning, information resources, publications, collaboration and cooperation, and participation are very prominent in the responses of the commons users. Some of the views of the commons users were demonstrative in the sense that they indicated whether resources were available, and/or commons users are IT capable or not:

My digital literacy has improved because I now know the parts of computers and tablets, I can also create email account for other library users and help with internet searching in our knowledge commons.

Because of the resources which are available to develop the digital literacy and creative skills such as creating email account and internet searching in the library.

Development of technology as a part of learning encourages people to interact better with digitization.

Recent development has made the library a centre of attraction in our community with different resources and services.

We don't have enough computers and tablets to train unemployed out-of-school youth so that they can search jobs online.

Responses were not exclusively positive

Network is very slow and no free Wi-Fi for us.

Never been part of any participation in the library.

No tablets, Wi-Fi, photocopy machine and play station.

Not enough digital resources.

Officials don't have scheduled computer trainings for library users or community members.

Altogether, users of the commons appeared to be constructing their opinions about the commons in Thabo Mofutsanyana District from the perspective of what they can learn with the aid of IT with the assistance of library officials. The key ingredient learned centres around IT capacity acquisition and use. A critical aspect of the commons namely participation in the management of the resources

through donation of resources and rules-in-use and rules-in-form making appears not to be very significant.

7.3.2 Social and material resources in the commons

The respondents were asked to indicate their opinions on the availability of the social and material resources in the commons that support diverse information and other engagements necessary to stimulate learning in their libraries. Table 7.3 presents the results. Regarding sufficiency of the space in the library for commons, 36.1% and 39.2% of the respondents affirmed the statement while only 6.3% and 3.2% respectively differed ($M = 3.99$, $SD = 1.03$). Meeting people to learn occurs in the commons and 36.7%, and 38.0% respectively strongly agreed and agreed respectively; 15.2% of the respondents that were undecided is considerably high ($M = 4.01$, $SD = 0.98$).

Table 7.3: Social and material resources of the commons that support learning

	SA	A	U	D	SD	M	SD
The space in the library has all the digital resources I require	36.1	39.2	15.2	6.3	3.2	3.99	1.03
I can meet people I learn from in the library	36.7	38.0	15.2	9.5	.6	4.01	0.98
The level of interaction among users of the space is very useful to me	41.8	37.3	12.0	7.6	1.3	4.11	0.98
I have the liberty to influence others positively	37.3	41.8	13.9	5.1	1.9	4.08	0.94
I meet those that influence me positively	41.1	38.0	11.4	8.9	.6	4.10	0.97
I have met people that are disgusting to me in the space	14.6	17.1	20.9	23.4	24.1	2.75	1.38
The supportive role of the commons staff is very helpful	51.3	30.4	10.8	5.1	2.5	4.23	1.00
I have at one time or the other acquired some digital resources such as software from colleagues I met in the commons	22.8	39.2	18.4	15.8	3.8	3.61	1.12
I have acquired some digital skills from some people I have met in the commons	32.9	39.9	13.3	8.2	5.7	3.86	1.14

On the usefulness of interaction that takes place among users of commons 41.8% and 37.3% strongly agreed and agreed respectively while only 7.6% and 1.3% differed in their own opinions

(M =4.11, SD=0.98). The commons gives users the liberty to influence others positively and 37.3% strongly believed this while 41.8% agreed. Few people differed as 5.1% strongly disagreed and 1.9% disagreed (M =4.08, SD=0.94). Exposure for personal influence as a reason for the commons was strongly agreed with by 41.1% and 38.0% agreed; 8.9% and 0.6% did not agree. Have the commons users met people that are disgusting to them? Only 14.6% and 17.1% strongly agreed and agreed respectively while 23.4% and 24.1% strongly disagreed and disagreed respectively. It must be pointed out that 23.4% that were undecided could be considered somewhat high. Regarding commons staff, 51.3% of the respondents strongly agreed while 30.4% agreed that they were very helpful while 5.1% and 2.5% differed (M=4.23, SD=1.00). Only 22.8% and 39.2% of the respondents reported that they have at one time or the other acquired some digital resources such as software from colleagues met in the commons; 15.8% and 3.8% have not had the same privilege (M=3.86, SD=1.14). Finally, acquiring some digital skills from people in the commons is a reason for 32.9% strongly agreed and 39.9% agreed to embrace the commons while 8.2% strongly disagreed and 5.7% disagreed differed (M=3.86, SD=1.14).

7.3.3 Identifications with digital literacy

Based on their interactions with co-users of the commons, respondents were asked how they thought people’s experiences in the commons were reshaping their interests in and identifications with digital literacy. Table 7.4 presents the results of the opinions about digital literacy in the commons.

Table 7.4: People’s opinions about digital literacy in the commons

	SA	A	U	D	SD	M	SD
The commons is already fast-tracking digital literacy	36.1	43.0	15.2	3.8	1.9	4.08	0.91
The commons may fast-track digital literacy in the future	36.7	47.5	11.4	4.4	0	4.16	0.80
The commons is a distraction to digital literacy	6.3	19.0	15.2	29.1	30.4	2.42	1.27
I am yet to address my mind to this kind of issue	16.5	24.1	18.4	21.5	19.6	2.96	1.38

Regarding whether the commons is fast-tracking digital literacy, majority of the respondents affirmed the assertion 36.1%, strongly agreed and 43.0% agreed while very few 3.8%, disagreed and 1.9%, strongly disagreed, (M=4.16, SD=0.80). The result with respect to the commons fast tracking digital literacy in the future was nearly same as that of the commons already fast-tracking digital literacy: 36.7% strongly agreed, 47.5% agreed while only 4.4% disagreed (M=4.08, SD=0.91). Very few respondents 16.5%, strongly agreed, 24.1% agreed and 19.6% disagreed and 2.96% strongly disagreed (M=2.96, SD=1.38) were yet to address their minds to the question. On whether the commons is a distraction to digital literacy, 6.3% strongly disagreed, 15.2% agreed while 30.4% and 2.42% disagreed and strongly disagreed respectively (M=2.42, SD=1.27).

7.3.4 Digital skills and creative competences developed in the commons

The study examined the digital competences and IT capabilities which the users of the commons develop. Table 7.5 shows that 43.0% and 40.0% respectively strongly agreed and agreed that they acquired a skill on use of digital technologies from the commons while 2.5% and 3.5% agreed and disagreed respectively (M=4.18, SD=0.95).

Table 7.5: Digital skills and creative competences developed by commons participants

	SA	A	U	D	SD	M	SD
Use of digital technologies	43.0	40.5	10.8	2.5	3.2	4.18	0.95
Use of free and open access resources	43.0	37.3	10.1	4.4	4.4	4.23	1.83
Use of FOSS (Free and open-source software)	41.1	34.2	12.0	7.6	5.1	3.99	1.14
Use of social media	38.6	32.9	13.9	6.3	8.2	3.87	1.23
Use of internet	59.5	23.4	10.1	4.4	2.5	4.33	1.00
Other literacy, not necessarily digital	20.9	34.2	21.5	17.7	5.7	3.47	1.17

Also, 43.0 and 37.3% strongly agreed and agreed respectively that they acquired the skill of use of free and open access resources while 4.4% apiece did not affirm the assertion (M=4.23, SD=1.83).

Skills about FOSS were acquired by 41.1% and 34.2% while only 7.6% and 5.1% did not affirm the assertion. Using social media was a skill acquired by 38.6% and 32.9% of the respondents who

strongly agreed and agreed respectively, while few respondents 6.3% and 8.2% did not support the assertion ($M=3.87$, $SD=1.23$). Also, skill for using the internet was acquired by 59.5% and 23.4% while 17.7% and 2.5%, disagreed and strongly disagreed with the assertion respectively ($M=4.33$, $SD=1.00$). Finally, 20.9% and 34.2% of the respondents acquired other types of literacy from the commons while 17.7% and 5.7% did not affirm the assertion ($M=3.4$, $SD=1.17$).

7.3.5 Meanings users attach to their engagement in the commons, and motivations

Further, the study sought to find out the opinions of the respondents regarding the meanings and motivations they attach to their engagement in the commons. Table 7.6 presents meanings and motivations users attach to their engagement in the commons.

Table 7.6: Meanings and motivations users attach to their engagement in the commons

	SA	A	U	D	SD	M	SD
The commons is a place to make friends	41.1	29.1	13.9	9.5	6.3	3.89	1.22
The commons is a place to meet people who may assist one solve learning and related problems	50.0	37.3	5.7	4.4	2.5	4.28	0.94
The commons is a place to pass time	19.0	25.3	15.2	25.3	15.2	3.08	1.37
The commons is a place to engage in self-directed learning	37.2	50.0	7.1	3.8	1.9	4.17	0.86
The commons is a distraction to normal library services	15.2	20.9	11.4	20.9	31.6	2.67	1.48

The commons is a place to make friends to 41.1% and 29.1% of the respondents who strongly agreed, and agreed respectively. The reverse is the case for 9.5% and 6.3% who disagreed and strongly disagreed respectively. To the 50.0% and 37.3% of the respondents respectively, the commons is a place to meet people who may assist one solve learning and related problems, but the opposite was the case 4.4% and 2.5% who strongly disagreed and disagreed with the assertion. Also, 19.0% and 25.3% posited that they go to the commons in their libraries to pass time, but 25.3% and 15.2% differed ($M=3.08$, $SD=1.37$). The commons is a place to engage in self-directed learning for 37.2% and 50% who affirmed the assertion, but not same for 3.8% and 1.9% who disagreed and strongly disagreed respectively. Finally, the commons is a distraction to normal

library services was consented to by 15.2% and 20.9% who strongly agreed and agreed respectively, while 20.9% disagreed and 31.6% strongly disagreed did not agree with the assertion.

7.4 Biophysical conditions

7.4.1 Physical or observable items in the commons

In Table 7.7, respondents were asked to address how physical or observable items constitute a major attraction to them to the commons. Table 7.7 shows that books were rated ‘Very highly’ attractive resource by 49.4%, 38.6% rated it as High while lower number of respondents considered it Not high (5.2%) and Not very high (1.9%), (M=4.28, SD=0.93).

Table 7.7: Physical or observable items that constitute major attractions to the commons

	Very High	High	Undecided	Not High	Not Very High	M	SD
Books	49.4	38.6	4.4	5.7	1.9	4.28	0.93
Computers and tablets	46.2	29.1	7.0	13.9	3.8	4.00	1.20
People	32.9	34.8	15.8	14.6	1.9	3.82	1.10
Articles	24.1	43.0	18.4	12.0	2.5	3.74	1.04
Other	33.3	0	33.3	0	0	4.67	1.53

Computers and tablets attracted 46.2% Very highly, 29.1% Highly, but the attraction was not Very highly for 13.9% and Not highly for 3.8% (M=4.00, SD=1.20). People Very highly attracted 32.9% and highly 34.8% while not for 14.6% and 1.9% who reported Not very highly and Not highly respectively (M=3.82, SD=1.10). Articles attracted 24.1% Very highly, 43.0% Highly; 12.0% were not attracted Very highly while 2.5% were not attracted highly. Other categories of physical resources attracted 33.3% Very highly and 0.00% Highly while 33.3% were Undecided (M=4.67, SD=1.53).

7.4.2 Non-physical artefacts that attract users to the library

The respondents were asked to indicate non-physical artefacts that make information available and constitute a major attraction to the commons. Table 7.8 shows that the internet was the most attractive resource and was rated Very high by 76.6% of the respondents while 17.7% rated it

High. A few people 19% and 1.3% were not very much attracted to the commons by the internet (M=4.66, SD=0.74).

Table 7.8: Non-physical artefacts that constitute a major attraction to the commons in the library

	Very High	High	Undecided	Not High	Not Very High	M	SD
Internet	76.6	17.7	2.5	1.9	1.3	4.66	0.74
Social media	36.1	30.4	12.7	9.5	11.4	3.70	1.35
Press Reader - digital newspaper and magazine	19.6	37.3	17.1	12.7	13.3	3.37	1.30
Overdrive (library e-books)	19.0	25.3	25.3	15.2	15.2	3.18	1.32
ProLib library system	12.0	14.6	29.7	14.6	29.1	2.66	1.35
Online Public Access Catalog (OPAC)	11.4	7.0	31.6	20.9	29.1	2.51	1.29

The social media attracted 36.1% Very highly, 30.4% Highly; electronic resources of Press Reader, digital newspaper and magazine attracted 9.6% Very highly and 37.3% Highly while 12.7% and 13.3% were Not very highly and Highly attracted respectively. Library e-books were rated Very highly 19.0% and Highly by 25.3% while 15.2% apiece rated the resource Not very high and No high. Stand-alone online bibliography of a library collection that is available to the public or OPAC was the least attractive resource to the commons as only 11.2% and 7% reported Very highly and Highly respectively. Higher proportion of the respondents 20.9% and 29.1% reported that the resources did not attract them Very highly and Highly respectively.

7.4.3 Content that make the commons a major attraction

The respondents were asked how the content and related issues make the commons a major attraction to them. Table 7.9 shows that Communication – accessing of personal email was the most Highly rated factor (52.5%, Very highly) while 28.5% rated it Highly (M=4.014, SD=1.20). Obtaining knowledge from electronic documents was considered Very highly factor by 47.5% and Highly by 35.4%. On the other hand, 7% said it was not a very Highly important factor while 4.12% considered it Not highly (M=4.12, SD=1.15).

Table 7.9: Content and related issues that make the commons a major attraction

	Very High	High	Undecided	Not High	Not Very High	M	SD
Communication – accessing of personal emails	52.5	28.5	7.0	4.4	7.6	4.14	1.20
Knowledge from electronic documents	47.5	35.4	5.7	4.4	7.0	4.12	1.15
Education – computer classes	38.6	25.8	15.2	10.8	9.5	3.73	1.33
Accessing the library websites/ library system (ProLib)	22.8	12.0	21.5	12.0	31.0	2.82	1.55
Digital experience – online gaming	14.6	21.5	25.9	18.4	19.6	2.93	1.33
Other	100	0	0	0	0	5.00	0

Computer classes was a Very highly rated factor by 38.6% of the respondents while 25.8% rated the factor Highly (M=2.93, SD=1.33). Accessing the library websites/library system was Very highly by 22.8% while 12.0 % rated it High. This factor was not very Highly rated by 31.0% and Not high by 12.0% (M=2.82, SD=1.55). Finally, digital experience was rated Very highly by 14.6% and Highly by 21.5% while 18.4% and 19.6% rated the factor Very highly and Highly respectively.

7.5 The commons community of the library

7.5.1 Roles of users in the commons

The respondents were asked to describe their roles in the commons in their libraries. Table 7.10 that 84.4% of the respondents visited the commons to use the resources already existing in the space while 2.5% differed and 12.7% were undecided (M=2.28, SD=0.45).

Table 7.10: Roles of users in the commons in their libraries

	Yes	Undecided	No	M	SD
I come to the commons to use the resources already existing in the space	84.4	12.7	2.5	2.28	0.45
I periodically provide resources required to make the commons rich	24.7	39.2	36.1	1.89	0.77
I periodically provide policy ideas to the library regarding how to move the commons forward	27.8	29.1	43.1	1.85	0.83

Periodically providing resources required to make the commons rich was the reason 24.7% visited the commons while 36.1% did not provide resources; 39.2% were undecided (M=1.89, SD=0.77). Finally, periodically providing policy ideas to the library regarding how to move the commons forward was the reason for which 27.8% of the respondents visited the commons, while 43.1% did not provide policy ideas; 29.1% were undecided (M=1.85, SD=0.83).

7.6 Participating in making rules and regulations for the commons

7.6.1 Rules and regulations of the commons

On rules and regulations in the commons, respondents were asked to indicate if they have ever been involved in any rulemaking to keep the commons functional. Table 7.11 shows participation in making rules and regulations for the commons.

Table 7.11: Participation in making rules and regulations for the commons

	Yes	Undecided	No	M	SD
Making rules for day-to-day operations of the commons	17.1	25.3	57.6	1.59	0.77
One of the individuals that interact to decide the operational rules	12.0	31.6	56.3	1.56	0.70
One of the groups that define who may participate in making collective choices	15.2	28.5	56.3	1.59	0.74
Other	8.9	60.1	31.0	1.78	0.59

Making rules for day-to-day operations of the commons was accented to by only 17.1% while 56.3% did not accent and 25.3% were undecided (M=1.59, SD=0.77). Also, only 12.0% of the respondents know any individuals that join to decide the operational rules; a high number 56.3%

had no response while 31.6% were undecided. Also, only 15.2% of the respondents have any idea about any groups that define who may participate in making collective choices while 56.3% had no idea and 28.5% were undecided (M=1.59, SD=0.74).

7.6.2 Awareness of rules in the commons

Do the respondents know about any rules in the commons at all? Table 7.12 shows that 70.9% know who may access the commons while 15.2% did not know and 13.9% were undecided (M=2.56, SD=0.74). Also, 55.1% know who manages the commons, 18.4% did not know while 26.6% were undecided. Fewer people (49.4%) know who should contribute to the commons, 20.3% did not know while 29.7% were undecided (M=2.16, SD=0.87).

Table 7.12: Awareness of rules in the commons

	Yes	Undecided	No	M	SD
Who may access the commons	70.9	13.9	15.2	2.56	0.74
Who should manage the commons	55.1	26.6	18.4	2.37	0.78
Who should contribute to the commons	49.4	29.7	20.3	2.30	0.80
Who could exclude others from accessing the commons	41.8	28.5	28.5	2.16	0.87
Who could extract or remove content from the commons	39.9	36.1	24.1	2.16	0.79
Who has the right to sell or lease content from the commons	36.7	27.2	34.8	2.04	0.88

Who has power to exclude others from accessing the commons was known by 41.8%, 28.5% did not know while 28.5% were undecided (M=2.16, SD=0.87)? Further, 39.9% know who could extract or remove content from the commons while 36.1% were undecided and 24.1% did not know (M=2.16, SD=0.79). Finally, 36.7% know about who has the right to sell or lease content from the commons, 27.2% were undecided while 34.8% did not know (M=2.04, SD=0.88).

7.7 Incentives for participating in the commons

7.7.1 Incentives to encourage and facilitate participation in both using and making rules

The respondents were requested to indicate if the library provides the users any incentives to encourage and facilitate their participation in both using and making rules to keep the commons

functional. Less than half, 46.2% mentioned that they did participate, while 31.0% did not know, and 20.9% did not know.

7.7.2 Supply of resources to the library for public use

In terms of whether the library has ever requested that respondents participate in supply of resources for public use, half of the respondents (50.0%) indicated 'yes' while those that were 29.1%, and the lowest number of who did not know about it (18.4%).

7.7.3 Donation of tangible or intangible resources to the library

The researcher wanted to find out if the respondents were willing to donate tangible or intangible resources to the library if they were requested to do so. More than half of the respondents (59.5%) reported that they were willing to donate tangible or intangible resources to the library if they are requested to do so, while 5.1% were not willing, and others 32.3%.

7.8 Outcomes

7.8.1 What should the libraries do to make the commons successful?

Respondents were asked what the libraries should do to make the commons successful. Table 7.13 shows that increasing the amount and quality of scientific knowledge was considered a great option by over half of the respondents (50.55%) while 30.4% considered as a somewhat option ($M=4.34$, $SD=0.90$). The issue of working towards equality in the commons by redistributing resources to poorer individuals was considered a great option by 48.7% while 25.9% considered the option as somewhat.

Table 7.13: What should the libraries do to make the commons successful?

	Great	Somewhat	Undecided	Not great	Not at all	M	SD
Increasing the amount and quality of scientific knowledge;	55.1	30.4	10.1	2.5	1.9	4.34	0.90
Working towards equality in the commons by redistributing resources to poorer individuals	48.7	25.9	7.0	12.0	6.3	3.99	1.27
Applying fair standards in the sense that all individuals benefit equally from their contributions;	46.8	32.9	8.2	8.9	3.2	4.11	1.09
Building standards that lead to high levels of participation in the commons;	42.4	34.2	13.3	7.0	3.2	4.06	1.06
Maintaining the sustainability and preservation of the commons;	40.5	37.3	13.3	6.3	2.5	4.07	1.01
Ensuring the economic efficiency of the commons;	30.4	34.2	17.1	13.9	3.2	3.78	1.15

Applying fair standards in the sense that all individuals are expected to benefit equally from their contributions and resources in the library, building standards that lead to high levels of participation in the commons, and maintaining the sustainability and preservation of the commons were considered great options by 46.8%, 42.4% and 40.5% respectively. Further, 32.9%, 34.2% and 37.3% considered the options as somewhat important. Finally, ensuring the economic efficiency of the commons was the least in importance.

7.8.2 Assessing level of participation in the commons in your library

When asked to assess the level of participation in the commons in their libraries, an overwhelming majority of respondents (81.6%) indicated their participation as fair, while those who did not know

was 10.1%, and those who believed that the level of participation in the commons in their libraries is unfair was 8.2%.

7.8.3 Opinions about the advantages of the commons

Table 7.14 relates to the opinions of the commons users regarding the advantages of the commons and also presents the results of the opinions about the commons in the library.

Table 7.14: Opinions about the commons in the library

	SA	A	U	D	SD	M	SD
The commons is sustainable	35.4	37.3	15.2	9.5	2.5	3.94	1.06
The commons increase the amount of high-quality scholarship	29.1	30.4	20.9	13.9	5.7	3.63	1.20
The commons promote equality among users	50.0	29.7	6.3	10.1	30.8	4.12	1.14

The results in Table 7.14 indicates that 50% of the respondents agreed that commons promote equality among users (M=4.12, SD=1.14), 35.4% agreed that commons is sustainable (M =3.94, SD=1.06) while 29.1% agreed that commons increases the amount of high-quality scholarship (M =3.63, SD=1.20).

7.9 Cross-examination of demographic variables with library use variables

- (i) Age versus how long users have been using the library

Age of the respondents was cross-examined with how long users have been using the library, and the output was tested with Chi Square test.

Table 7.15: Chi-Square Tests of demographic variables versus length of using the library

	Value	Df	Asymp. Sig. (2-sided)
Age	189.903 ^a	104	0.000
MS	167.911 ^a	156	0.243
HEQ	173.535 ^a	156	.160

Table 7.15 shows that age $\chi^2(104, N=158) = 189.903, p=0.000$. There is a significant association between age of the library users and their length of use of the libraries. Evidently therefore, older respondents have been using the library longer than the younger respondents.

(ii) Marital status vs. length of use of the library

Marital status was also cross-examined with how long library users have been using the library. Table 7.15 shows that $\chi^2(156, N=158) = 167.911, p=0.243$. This result shows that there is no significant association between marital status of the library users and their length of usage of the library. In other words, marital status of the library users is not an important factor in understanding length of time the library users have used the library.

(iii) Highest educational qualification of respondents vs. How long have you been using this library?

Table 7.15 shows that $\chi^2(156, N=158) = 173.535, p=0.160$. This result implies that there is no relationship between highest qualification of the respondents and the length of time they have been using the library.

7.9.1 Further analysis: Multivariate statistics

Multivariate analysis is very suitable for understanding social events that are naturally not amenable to linear reasoning, because the statistical analysis approaches encompass processes that consider and address the need to linearize data. By creating opportunities for deploying a large chunk of data at the same time into the system, multivariate analysis enables researchers minimize type one error, that is, the chances that a true hypothesis will be rejected (Feinberg 2001). Usually, multivariate analysis would involve data that has a substantial number of variables, often leading to non-trivial and intractable statistical analysis. As has been indicated, the researcher deployed factor analysis. Deploying discrete multivariate analysis has become common since the 1970s, happening at a time when psychosocial disciplines are faced with the serious challenges of how to assimilate statistical methodologies that are known to be suited for continuous variables in the natural science disciplines (Maddala 1983).

7.10 Data Preparation

In this research, 74 variables were involved, minus demographic characteristics and questions with binary or other response types that do not conform to the assumptions of data reduction. Principal Component Analysis was used to reduce the dimensionality of the datasets, producing a new dataset that retained much of the statistical information (or variability), in the original dataset. The adequacy of the sample for PCA was satisfactorily measured by KMO Test in SPSS version 22. The sample is considered adequate when the value of KMO is larger than 0.5. The Kaiser Meyer Olkin measure of sampling adequacy test for the sample in this study accounted for 79%, higher than the 60% threshold (Hair et al 2010), showing that the sample is adequate. Bartlett's test of sphericity was significant $\chi^2 (2628) = 6435.326, p=0.000$. Hence, the correlation matrix was not an identity type, and was suitable for further deployment for higher statistical analysis.

Table 7.16: Sum of the squared factor

	Initial	Extraction
Q27.5 Applying fair standards in the sense that all individuals benefit equally from the resources in the commons	1.000	.801
Q27.2 Maintaining the sustainability and preservation of the commons	1.000	.790
Q27.3 Building standards that lead to high levels of participation in the commons	1.000	.790
Q23.3 Awareness of rule of extracting or removing content from the commons	1.000	.785
Q27.4 Ensuring the economic efficiency of the commons	1.000	.777
Q19.6 Press Readers are available	1.000	.775
Q23.6 Awareness of rule of selling or leasing content from the commons	1.000	.771
Q22.2 One of the individuals that interact to decide the operational rules	1.000	.769
Q23.2 Awareness of rule of contributing to the commons	1.000	.769
Q23.1 Awareness of rule of accessing the commons	1.000	.768
Q27.1 Increasing the amount and quality of scientific knowledge	1.000	.766
Q26 Requisition to donate tangible or intangible resources to the library	1.000	.761
Q12.6 Met people that are disgusting to me in the space	1.000	.760
Q20.2 Knowledge from electronic documents	1.000	.757
Q16.4 Use of social media obtains in the commons	1.000	.749
Q12.9 Acquired some digital skills	1.000	.748
Q19.1 Internet access availability	1.000	.743
Q10.8 Access to electronic resources is clear in terms of intellectual property	1.000	.742
Q12.3 Interaction among users is very useful to me	1.000	.741
Q16.3 Use of FOSS (Free and open-source software)	1.000	.741

Q27.6 Working towards equality in the commons by redistributing resources to poorer individuals	1.000	.741
Q10.7 Open access resources supplement online library materials	1.000	.739
Q16.5 Use of internet	1.000	.736
Q18.4 Computers, tablets or online games	1.000	.734
Q19.2 Social media services are available	1.000	.733
Q15.3 Commons is a distraction to digital literacy	1.000	.731
Q16.6 Other literacy, not necessarily digital	1.000	.731
Q17.3 Commons is a place to pass time	1.000	.730
Q22.1 Making rules for day-to-day operations of the commons	1.000	.729
Q18.1 Articles are available in the commons	1.000	.726
Q10.6 Education resources must be published with open licenses	1.000	.725
Q12.2 Meet people that I can learn from	1.000	.724
Q10.3 Open access resources often apply copyright restrictions	1.000	.720
Q18.2 Books are available in the commons	1.000	.719
Q28 Assessing the level of participation in the commons in your library	1.000	.716
Q19.4 Online Public Access Catalogue (OPAC) is functional in the commons	1.000	.712
Q24 Provision of incentives to encourage and facilitate participation in using and making rules in the commons	1.000	.708
Q17.5 Commons is a distraction to normal library services	1.000	.705
Q19.5 Overdrive	1.000	.705
Q12.8 Acquired some digital resources	1.000	.704
Q23 5 Awareness of rule of excluding others from accessing the commons	1.000	.704
Q17.4 Commons is a place to engage in self-directed learning	1.000	.703
Q20.5 Accessing of personal emails	1.000	.702
Q15.2 Commons may fast-track digital literacy in the future	1.000	.699
Q15.1 Commons is already fast-tracking digital literacy	1.000	.698
Q16.1 Use of digital technologies	1.000	.698
Q29.3 The commons promotes equality among users	1.000	.697
Q29.2 The commons increase the amount of high-quality scholarship	1.000	.692
Q10.1 Open access resources are available in the commons	1.000	.689
Q12.1 Space has all the digital resources I require	1.000	.689
Q20.3 Computer classes hold in the commons	1.000	.688
Q23.4 Awareness of rule of managing the commons	1.000	.686
Q22.3 One of the groups that define who may participate in making collective choices	1.000	.685
Q29.1 The commons is sustainable	1.000	.684
Q12.5 Meet those that influence me positively	1.000	.682
Q21.1 I come to the commons to use the resources already existing in the space	1.000	.676
Q19.3 ProLib Library system	1.000	.673
Q17.2 Commons is a place to meet people who may assist one solve learning and related problems	1.000	.670
Q12.4 Liberty to influence others positively	1.000	.669

Q16.2 Use of free and open access resources	1.000	.667
Q20.4 Online gaming	1.000	.665
Q10.2 Knowledge published is enclosed in the commons in the library	1.000	.664
Q10.5 Open access has a greater research impact for students and/or library users	1.000	.657
Q18.3 Web pages	1.000	.653
Q20.1 Accessing the library websites/ library system (ProLib)	1.000	.648
Q21.3 I periodically provide policy ideas to the library regarding how to move the commons forward	1.000	.647
Q25 Requisition to supply resources to the library for public use	1.000	.641
Q15.4 I am yet to address my mind to this kind of issue	1.000	.637
Q17.1 Commons is a place to make friends	1.000	.632
Q18.5 People	1.000	.621
Q21.2 I periodically provide resources required to make the commons rich	1.000	.608
Q12.7 Supportive role of the commons staff is very helpful	1.000	.603
Q10 4 Knowledge published is enclosed in the commons in the library	1.000	.531
Extraction Method: PCA		

Communalities, or sum of the squared factor loadings for each of the variables, representing the proportion of each variable's variance explained by the factors, were computed. Usually, the values range between 0 and 1 and values closer to 1 suggest that the extracted factors explain more of the variance of an individual item. Table 7.16 shows the communalities for each of the 74 variables in the study in descending order of their magnitudes. The descending order of the communalities reflects the pattern of sufficient common variation of each of the variables retained in the factor solution. It can be seen that "Applying fair standards in the sense that all individuals benefit equally from their contributions" has the highest communality, $h^2=0.801$. Even the weakest variables in this system "Knowledge published is enclosed in the commons in the library" ($h^2=0.531$) has a sufficiently high communality to be a good candidate for higher statistical analysis.

The Total Variance Explained which refers to the proportion of variables that a mathematical model would be able to account for their variation was also computed. This process revealed that the 74 variables in the study were reduced to 37 and grouped into 10 classes or constructs that are suitable variable-candidates for further analysis, which were used for the CFA and SEM analysis.

Table 7.17: Table of variance explained

	Number of constructs	% of Variance explained from the PCA
Digital Literacy: ComImpDL	2	28.219
Nonphysical artefacts: NonPHY	2	8.046
Learning stimuli: STIMULI	6	5.697
Knowledge published in electronic space is enclosed: Perknowelect	5	4.529
Creative competencies: DLSCom	3	3.952
Engagement in the commons: MEC	3	3.490
Awareness of the rules: AWRul	6	3.306
Participating in making rules: RULMSc	3	2.918
Commons outcome: ComOutco	4	2.594
Access to knowledge: OAcmm	3	2.499
<i>Total</i>	<i>37</i>	<i>65.25%</i>

Table 7.17 shows that the 10 groups of variables explained 65.20% of the entire variation; the rest of the variables explained small variations and therefore added little or nothing to the analysis. After the data preparation in SPSS version 22, AMOS version 23 was used to achieve SEM.

The measurement model was assessed first using CFA, and then the structural model assessment. Reliability analysis was carried out for internal consistency and the result showed the reliability coefficient scores were in the range 0.62–0.97. This diagnosis so far was based on a total of 180 copies of the questionnaire hand-delivered to commons users; 158 were returned, a response rate of 87.7%. Majority of respondents, 60.3% described themselves as residents while professionals were 27.6%, followed by 7.7% community leaders, heads of institutions (3.8%) and other (0.6%). Figure 7.1 shows Pooled CFA Model.

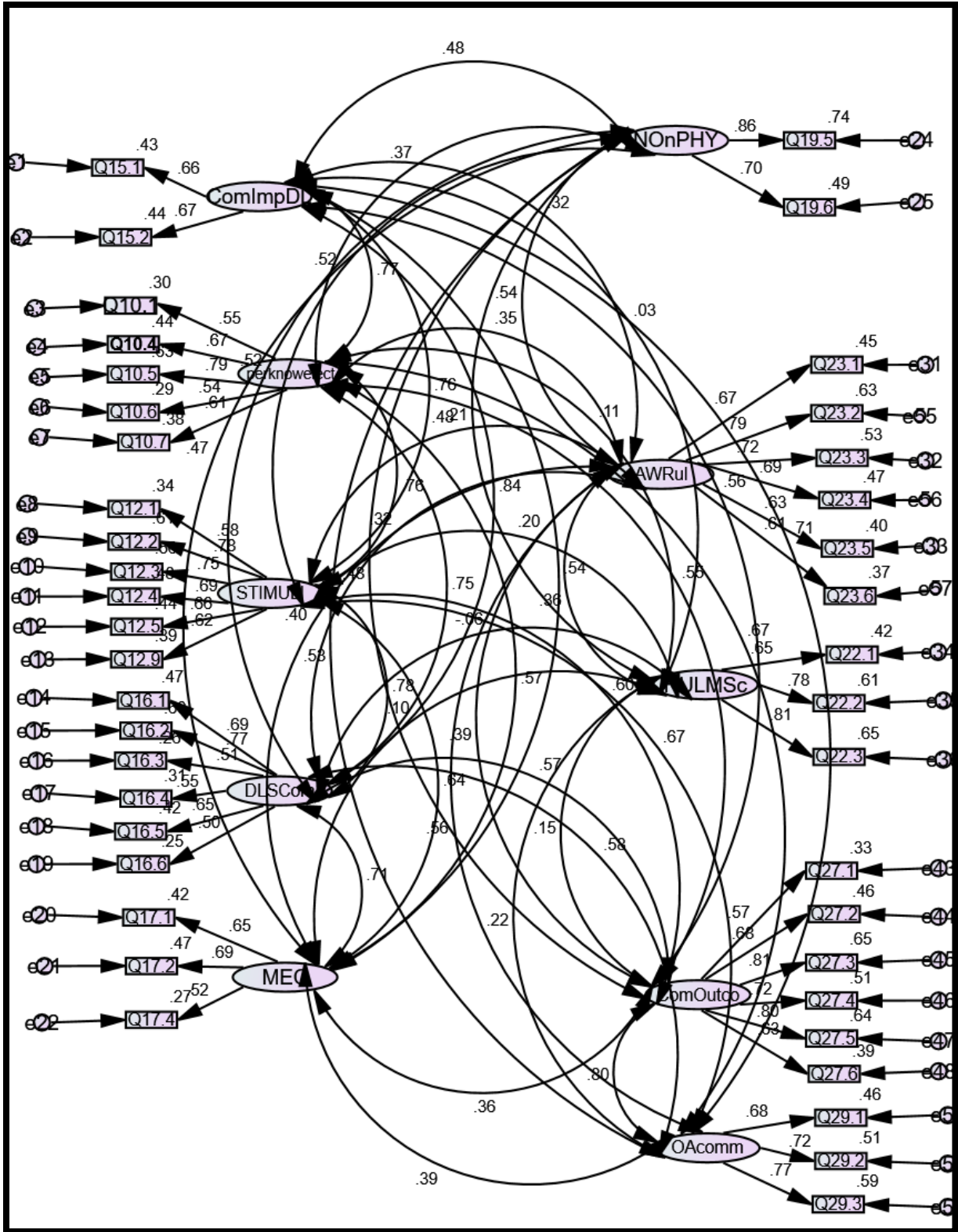


Figure 7.1: Pooled CFA Model

Note: ComImpDL = Digital Literacy; NonPHY = Nonphysical artefacts; STIMULI = Learning stimuli; Perknowelect = Knowledge published in electric space; DLSCom = Creative competencies; MEC = Engagement in the commons; AWRul = Awareness of the rules; RULMSc = Participating in making rules; ComOutco = Commons outcome; OAcomm = Access to knowledge

Model fit Indices: $P < 0.0001$, $\chi^2 = 1238.608$, $d.f. = 774$, $X^2/df = 1.600$, $GFI = 0.745$, $AGFI = 0.703$, $RMSEA = 0.062(0.055-0.068)$, $TLI = 0.818$, $CFI = 0.836$, $RMR = 0.070$; $SRMR = 0.085$

Figure 7.1 presents the result of measurement model fit. The model assessed based on Kline's (2005) recommendation that model Chi interval for Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Standardized Root Mean Square Residual (SRMR) be approximate fit values between 0.05 and 0.08 (Kline 2005). When CFI is greater than roughly 0.90, then there is a high likelihood of a reasonably good fit. SRMR values "less than 0.10 are generally considered favourable" (Kline 2005:140). Model fit was assessed using four goodness-of-fit indices: Chi-square (X^2) SRMR, RMSEA with its 90% confidence interval. Also, $RMSEA \leq 0.05$ indicates close approximate fit, values between 0.05 and 0.08 and suggest reasonable error of approximation, and ≥ 0.10 suggests poor fit (Kline 2005).

The analysis proceeded to identify items that were weak and should therefore be discarded. This enabled us ascertain whether the measurement model was valid before assessing the structural model. Any items with weak loadings, that is < 0.50 , or that showed poor discriminant validity were discarded. Table 7.18 presents the number of items per construct, internal consistency values, and average variance extracted. Four constructs were loaded with six manifest or observed variables while one was loaded with five and three loaded with three and two were loaded with two respectively. Researchers should use a relatively small number of good indicators, rather than beguiling themselves with a relatively large number of low-quality variables. It can also be seen that all the constructs had acceptable reliability and validity thresholds.

Table 7.18: Construct reliability and validity

Constructs	No of Items/Components	Composite Reliability	Cronbach's Alpha	Average Variance Extract
ComImpDL	2	0.613	0.605	0.442
NonPHY	2	0.760	0.752	0.615
STIMULI	6	0.839	0.835	0.467
Perknowelect	5	0.771	0.762	0.408
DLSCom	6	0.785	0.783	0.384
MEC	3	0.654	0.639	0.390
AWRul	6	0.842	0.841	0.473
RULMSc	3	0.793	0.789	0.562
ComOutco	6	0.855	0.846	0.500
OAcmm	3	0.768	0.767	0.525

Note: ComImpDL = Digital Literacy; NonPHY = Nonphysical artefacts; STIMULI = Learning stimuli; Perknowelect = Knowledge published in electric space; DLSCom = Creative competencies; MEC = Engagement in the commons; AWRul = Awareness of the rules; RULMSc = Participating in making rules; ComOutco = Commons outcome; OAcmm = Access to knowledge

(i) Construct reliability

Construct reliability was assessed based on Fornell and Larcker's (1981) measure which recommended that internal consistency value be preferred for SEM analyses because it deploys the observed loadings to accurately reflect the latent variables. Cronbach's Alpha values of 0.70 or higher are recommended by (Fornell & Larcker 1981). All the constructs presented in Table 7.18 met that standard and were therefore acceptable.

(ii) Convergent validity

Convergent validity was assessed by calculating the Average Variance Extracted (AVE) for each construct. Usually, a value of 0.50 and above is acceptable. As seen in Table 7.18, four focal constructs had $AVE > 0.50$ while others have AVE equal to or slightly lower than 0.50. Hence, the researcher therefore accepted the convergent validity as adequate. All the manifest variables in this study showed standardised factor loadings >0.50 . This shows that that the variables are significant indicators of the constructs, and thus convergent validity is acceptable. Besides, this result confirms that measurement model is un-dimensional (Hair et al 2010).

(iii) Discriminant validity

To establish discriminant validity, the procedure recommended by Fornell and Larcker (1981) was used. In this method, discriminant validity is achieved if square root of AVE is higher than maximum shared correlation. Table 7.19 shows that the discriminant validity is not acceptable because the variables do not meet the criteria specified.

Table 7.19: Discriminant validity

Constructs	R squared	R squared MSV	ASV	AVE	Validity
ComImpDL	0.615	0.290	0.129	0.128	Not Acceptable
NonPHY	0.428	0.081	0.219	0.095	Not Acceptable
STIMULI	0.325	0.193	0.135	0.128	Not Acceptable
Perknowelect	0.227	0.285	0.167	0.195	Not Acceptable
DLSCom	0.422	0.277	0.126	0.428	Acceptable
MEC	0.226	0.177	0.166	0.095	Not Acceptable
AWRul	0.327	0.192	0.221	0.125	Not Acceptable
RULMSc	0.226	0.082	0.106	0.195	Acceptable
ComOutco	0.324	0.187	0.222	0.128	Not Acceptable
OAcComm	0.219	0.073	0.262	0.195	Not Acceptable

Note: r = correlation, MSV= Maximum Shared squared Variance, ASV= Average Shared Squared Variance, AVE= Average Variance Extract

Table 7.19 shows that except for DLSCom and RULMSc which produced acceptable discriminant values, AVE is higher than the MSV and ASV for the rest of the variables, and were therefore unacceptable.

7.11 Hypothesis testing

Table 7.20 shows the regression paths of the research model, showing the causal effects of the independent variables on the dependent variables. Maximum likelihood estimation was used to generate the estimates.

Table 7.20 show only the six hypotheses that were stated for this study.

Table 7.20: Unstandardised and standardised regression weight: hypothesized path model

			Unstandardised Regression				Standardised Regression	SMC
Regression Paths			B	SE	CR	P	B	R ²
Non- physical conditions	→	Digital literacy	0.663	0.177	4.731	0,000	0.475	0.411
Access to knowledge	→	Learning stimuli	0.449	0.195	3.023	0,000	0.763	0.302
Awareness of rules of the commons	→	Commons outcomes	0.210	0.249	2.698	0,000	0.392	0.242
Digital literacy	→	Engagement with in the commons	0.392	0.113	2.575	0,000	0.539	0.119
Engagement	→	Digital competence	0.199	0.044	1.317	0,016	0.709	0.109
Positive opinions about commons	→	Participation in rule making	0.163	0.155	2.065	0,043	0.216	0.887
R ² =0.815								

Note: SMC= Square Multiple Correlation

The unstandardised and standardised regression weights reflect the direct effects of independent variables on dependent variables. The R² SMC was used to capture the total variance explained in the dependent variables. A description of the results in table 7.20 corresponds with the assessment of each of the six hypotheses, and hence follows.

(1) Hypothesis One

There is no significant relationship between the non- physical material of the library and the perceived commons' impact on digital literacy among the library users at the Thabo Mofutsanyana District.

Table 7.20 that there is a significant relationship between the independent variable namely the non- physical material of the library and the perceived commons' impact on digital literacy ($\beta=0.475$, $p=0.000$). The null hypothesis is therefore rejected. The non- physical materials of the

library accounted for 41% of the total variance of the perceived commons' impact on digital literacy.

(2) Hypothesis Two

There is no significant relationship between access to knowledge published in the electronic space and learning stimuli at the Thabo Mofutsanyana District.

Furthermore, Table 7.20 shows that there is a significant relationship between access to knowledge published in the electronic space and learning stimuli ($\beta = 0.763$, $p = 0.000$). The null hypothesis is also therefore rejected. However, the non-physical materials of the library accounted for only 30% of the total variance of the learning stimuli in the commons in Thabo Mofutsanyana District libraries.

(3) Hypothesis Three

There is no significant relationship between users' awareness of rules of the commons and commons' outcomes at the Thabo Mofutsanyana District.

Table 7.20 also shows that there is a significant relationship between users' awareness of rules of the commons and commons' outcomes at the Thabo Mofutsanyana District. ($\beta = 0.392$, $p = 0.000$). The null hypothesis is also therefore rejected. Users' awareness of rules of the commons accounts for only 39% of the total variance of the commons outcomes in Thabo Mofutsanyana District public libraries.

(4) Hypothesis Four

There is no significant relationship between commons' impact on digital literacy and users' motivation for engagement in the commons at the Thabo Mofutsanyana District.

Table 7.20 also shows that there is a significant relationship between commons' impact on digital literacy and users' motivation for engagement in the commons at the Thabo Mofutsanyana District ($\beta = 0.539$, $p = 0.000$). The null hypothesis is also therefore rejected. Users' awareness of rules of

the commons. Expected impact of the commons accounted for 53% of the total variance of users' motivation to use the commons.

(5) Hypothesis Five

There is no significant relationship between motivation for engagement in the commons, and digital literacy and competence of the library users at the Thabo Mofutsanyana District.

Table 7.20 also shows that there is a significant relationship between motivation for engagement in the commons and digital literacy and competence of the library users at the Thabo Mofutsanyana District ($\beta= 0.709$, $p =0.000$). The null hypothesis is also therefore rejected. Users' awareness of rules of the commons. Expected motivation for engagement in the commons accounted for 71% of the total variance of competence of the library users in the commons.

(6) Hypothesis Six

There is no significant relationship between users' assessment of the services in the commons and participation in the governance of the commons in the libraries at the Thabo Mofutsanyana District.

Finally, Table 7.20 shows that there is a significant relationship between users' assessment of the services in the commons and participation in the governance of the commons at the Thabo Mofutsanyana District ($\beta= 0.216$, $p =0.043$). The null hypothesis is also therefore rejected. Users' awareness of rules of the commons. Users' assessment of the services in the commons accounted for as low as 21% of the total variance of participation in the governance of the commons.

7.12 Synthesis of the chapter

This chapter presented the findings of the data collected at nine selected Thabo Mofutsanyana District public libraries. Data analysis presentation was divided in two sections. Firstly, the quantitative data was analysed using descriptive statistics and nonlinear factor analysis approaches. Furthermore, findings presentation was undertaken using versions SPSS 22 and AMOS 23 frequency, percentage, mean, standard deviation, and tables. Secondly, the next step

was hypotheses testing, which assisted the researcher to decide whether data approves or disproves the formal hypothesis construction using advanced inferential statistical technique, and whether it was generalizable to a larger population. The subsequent chapter will interpret and discuss major findings of the study.

CHAPTER EIGHT

INTERPRETATION AND DISCUSSIONS OF THE FINDINGS

8.1 Introduction

Chapter Seven presented the analysed descriptive statistics and statistical testing obtained through using quantitative research data, collected from the participating commons users through the use of questionnaire. According to Terre Blanche et al (2006), the discussions and interpretations should tie in with the outcome of the data analysed in Chapter Six and Seven. This chapter will interpret and discuss the findings of the study. In this chapter, the discussions indicated that for qualitative, findings were organized around themes, while in quantitative, the researcher organized the interpretations of the findings around the hypotheses and research questions. Creswell (2012) and Terre Blanche et al (2006) advise that interpretation and discussions of the findings must be presented according to the research questions arranged in themes.

8.2 Demographic profiles of the respondents

The demographic profiles of the respondents were collected to provide information about who participated in the current study. The demographic profiles of the respondents were presented as a first step towards understanding the most significant variables; age, gender, qualifications including marital status. Quantitative data was collected from 158 respondents who were commons users and qualitative data was collected from 16 CLs and 17 LOs.

The results of the study showed that all the respondents were of Black African descent from the sample. Majority (42.3%) have used their respective libraries for a period of 1 to 5 years. In addition, variables that emerged from the results indicated that those aged between 25 and 34 (33.3%) used the commons more than any other age categories. Furthermore, a cross tabulation of age of the library users and their length of use of the libraries was carried out, and the study revealed that older respondents have been using the library longer than the youngest respondents. The study revealed significant $\chi^2(104, N=158) = 189.903, p=0.000$ relationship between age and how long users have been using the library. This attributes the fact that the youth is using the

library more than the other age categories in the commons because they are attached to technology and use it for their personal and educational purposes.

Again, a cross tabulation of marital status and length of use of the library was carried out which revealed that majority 110 (70.1%) of the respondents were single and have never been married/ never lived together as husband/wife/partners. The study revealed significant $\chi^2(156, N=158) = 167.911, p=0.243$ relationship between age and how long users have been using the library. This indicates that young respondents who are single are using the libraries to meet their information needs through the access of ICTs more than other age categories.

Probe further, a cross tabulation of highest educational qualification of respondents and length of use of the library was carried out which revealed that 84 (54.2%) of the respondents had high school certificate or equivalent certificate. This finding signifies that qualifications and the library use did have any common factor. The study revealed significant $\chi^2 (156, N=158) = 173535, p=0.160$ difference between highest educational qualification of respondents and how long have you been using this library. This is an indication that the qualifications of the respondents do not affect the length of usage of the library, that's why the libraries are accessible to all members of the community regardless of their demographic status. Furthermore, the mean age of community leaders was 30.28 years, while the value was 38.76 years for library officials, and 33.2 years for the commons users. The results indicated that the youth is the most regular users of knowledge commons in this study because they are more technological savvy than others library users.

8.3 Open access and knowledge commons

The opinions of the respondents regarding the commons were largely positive, although there were few negative opinions. There was a positive reaction about the development of IT capacity with the supportive role of the library officials and how they impacted learning skills among users in the commons in the libraries. These opinions are expected because most of the commons users use the library for these particular reasons. This finding resonates with Benkler (1998); Boyle (2003); Lessig (2001) which indicated that the promise of openness, freedom including democracy are generally attracting commons users to participate in the commons. The negative opinions were

about slow internet speed, lack of digital resources, restricted access to free Wi-Fi and lack of computer trainings.

8.3.1 Level of awareness about open access

With almost all of the respondents reporting been confident and positive about their level of awareness about open access and associated developments, only few were uncertain about it. This is in line with the study by Fullard (2007) cited in Okore et al (2015) observed that there were open access resources available but students did not use them, and further conducted a study to assess if the librarians know these resources and how to use them as reference sources. Their study revealed that among other findings most of the librarians were not aware about of the open access philosophy in the private institutions of higher learning in Gaborone, Botswana academic libraries, and the few that were aware did not participate in its practices. On contrary, the Tanzanian health science librarians Lwoga and Quetier (2015) cited in Okore et al (2015: 4), conducted a study which revealed that the majority of librarians encouraged open access activities in their respective campus. The study revealed that regular trainings, promotion and advocacy of open access in the libraries to improve the commons users' awareness of open access is significant.

8.3.2 Strategies or systems to be implemented to support and promote open access

Of all the strategies or systems to be implemented to support and promote open access in the libraries majority of CLs reported free subscription and licensing fee, free Wi-Fi, trainings and workshops about open access, marketing, networking, and community needs analysis among others. For instance, the reason for requisition of free Wi-Fi was because users could utilize their own gadgets to use open access within the commons when the library ICTs equipment were fully occupied. The implementation of these strategies or systems will assist the libraries with easy accessing of knowledge published without restrictions.

8.3.3 Training on open access

The study revealed that almost half of the LOs had not received any relevant training on open access in the last five years. This finding is in line with the study of Emasealu and Umeozor (2016) which revealed the importance of the emerging role of the 21st centuries librarians who were responsible for the repository services in the libraries in the present day. Their study indicated that in order to maintain the successful management of 21st century ICT drive repository services, librarians needed to be equipped and trained in the required skills. Hence, the advent of new technologies has made the aspect of training and re-training an important factor in the 21st century (Emasealu & Umeozor 2016). Hence the researcher requested the library officials to elaborate on any training they have had on open access in the past five years. This finding corroborates with the study of Hashim and Mokhtar (2012) which attempted to understand what trends of a successful librarians and information professionals should be in this Information Age. This signifies that training is the process of learning which enhance the performance of officials. Their study also asserted that libraries expect librarians to perform well with fewer personnel. This is an indication that librarians without any training will be left behind in the technological era. Their libraries should always pursue skills development through trainings and workshops to meet up with the new technologies that will assist in terms of meeting the forever changing needs of their users. Contrastingly, the same findings revealed that most of the LOs, received relevant open access training through SABINET in the past five years, while others received a certain amount of training but not necessarily on open access. This study resonates with the study of Toffler (2011) cited in Hashim and Mokhtar (2012: 192) who revealed that in the 21st century, been illiterate will not indicate only those who cannot read or write, instead, those who will not be in the position to learn, relearn including unlearning. The training of library officials on open access in the public libraries will be part of the effective resource tools in the emerging commons.

8.3.4 Disposition towards the open access philosophy

Findings showed that majority of LOs elaborated that open access was a positive reinforcement to the information available at the library and was enough. The results of the study collaborate with the study by Tise and Raju (2013) who asserted that open access has three components, namely,

open distribution of scholarly content, open-source software, and then, open education resources. Further, it is indicated that collectively these components build a stronger and knowledgeable societies. On the same note, the findings attested that the participating public libraries had a clear role to open their doors to all community members, and that was a significant character behind the establishment of a new technology known as knowledge commons which ensured that the same community access information, share knowledge, collaborate and interact. This finding is in line with the study of Tise and Raju (2013) which indicated that the impetus for enhanced evolution of knowledge societies is provided by the openness to knowledge. Furthermore, their study revealed the transformation process which deals with the issues of free flow of information. Although open access tends to be intense, it differs significantly from commons (Morrison 2019; Brown et al 2003).

It is revealed that even if commons and open access differ significantly, open access and commons always go together. Therefore, current open access principle of access to knowledge in the internet at no cost to commons users appeared to be the major attraction to the commons in the public libraries. Moreover, the open access and the commons have the same denominator – information technology, which correlates with the study of Nwagwu (2013) who asserted that building open access is imperative and expand technology and knowledgebase. This is an indication that open access philosophy support access to electronic resources available in the commons in the libraries.

8.3.5 Open access model of knowledge access

The study reveals that commons were appropriate in terms of response to the development of the open access model of knowledge access, even though there were few LOs who were concerned about the accessibility of restricted materials within the commons. In addition, they admitted to support the significance of IPR in the library. The results are in line with the study of Mullen (2010) who argued that librarians particularly those who are directly involved with the collection development are aware of the subscription fees related with the traditionally-published journals, but still, they are not transforming their libraries to open access models which are required in the commons. The study also corroborates with the study of Kassahun and Nsala (2015) who highlighted recent studies which were conducted in America, Nigeria, and Tanzania among others

which indicated that majority of academic librarians had positive attitudes towards open access principles. Evidently, access to knowledge and various digital resources in the commons was closely tied to open access. Open access constitutes a major doorway to introducing knowledge commons.

8.3.6 Open access environment in the library

On the same note, findings revealed that open access environment was positive, favourable and conducive in the commons in the libraries. However, few of the LOs mentioned that the open access environment was not yet conducive due to the lack of free Wi-Fi and insufficient human resources. This implies that openness created by the emergence of commons, leads to a conducive open access environment which attract more users in the commons.

8.3.7 Open access policies, statement of positions in the library

The results revealed that most of the LOs had no idea about open access policies, statement or positions in their respective library, and indicated that the only existing ones were the internal rules. This is an indication that indeed there were no policies because other respondents were not even sure about what open access policy was. This finding conforms the study of Kyriaki-Manessi, Chaleplioglou and Vassilakaki (2006) who cited Bailey (2007) when he reported that it is important for libraries to establish open access policies. Libraries have to be careful when they create policies because they have to restart, revise or expand standards and procedures according to the new developments.

8.3.8 Social and materials resources in the commons

(a) Digital resources in the space in the commons

This study revealed that (39.1%) of the commons users reported that there was sufficient space in the commons. This implies that majority of commons users use the space because it consists of all the digital resources needed to meet their information needs. Furthermore, the study revealed that with the advent of new technologies, the various library users were now filling the library space in

increased numbers. Sufficient spaces in the commons are assumed to be the general purpose why commons users visit the library. The study is also consistent with the findings of McGinnis and Kinder (2020) when studying the use of library space and resources by library users. For this reason, public libraries have to be flexible enough to take into account the digital resources in the space which stimulate the learning skills of the commons users.

(b) Learning in the commons

The results of the study demonstrated that (38%) of the commons met people they could learn from in the commons. This is an implication that public libraries inculcate life-long learning skills and develop knowledgeable communities.

(c) Level of interaction in the commons

Enquiring on the level of interaction in the commons, most (41.8%) of the commons users opined that the space was very useful and supported the diverse information and other engagements necessary to stimulate their learning. Commons in the library by nature has a user centred perspective which also demonstrates their ability to use ideas through interactions. This finding also corroborates the findings of the studies by Li and Liu (2019); Tsakonas, Saranto, Kapidakis and Papatheodorou (2008) that evaluated user interaction in the libraries.

(d) Influences in the commons

Most (41.8%) of the commons users influenced other people positively in the commons in their respective libraries. While, most (41.1%) of the commons users met people who influenced them positively in the commons. Influence is complex, in a sense that when people get to know and like each other, they are more likely to learn, and share resources and knowledge. This conforms to a study by Carnegie (2009) which deals with how to make friends and influence people in the public space.

(e) Disgusting people in the commons

The study reveals that few (17.1%) of the respondents agreed that they met people that were disgusting to them in the space. This aspect of disgusting people was rated low; however, it raised a concern that other commons users were unsatisfied, hence their behaviour changed to being

negative and disgusting in the commons. In addition, the findings emphasized the fact that indeed the library had a wide spectrum of commons users with patterns of interactions which was supported by the majority of respondents. This finding corroborates with the study of Adebayoa, Fagbohunb, Osayandec and Owolabi (2015) in Nigeria, who conducted a case study in six libraries in Ondo State about dealing with difficult people in the libraries. The recommendations based on their findings revealed that disgusting people in the library needed regular trainings of library officials, library orientation programmes, relevant and updated library collection. These factors insinuate measures that can be used to prevent such behaviour in the public libraries.

(f) Supportive role of the library officials

Majority (51.3%) of the commons users received support from their library officials as one of the social and material resources in the commons. Library officials' supportive role in the commons, whether negative or positive, is considered to be affected by work attitudes based on job satisfaction. A similar study was conducted by Otieno, Otike and Rotich (2015) which studied library staff attitude to work on the use of information services.

(g) Acquired digital resources in the commons

Most (39.2%) commons users at one time or another acquired some digital resources such as software from colleagues in the commons in their respective libraries. As indicated earlier, commons also made nine selected Thabo Mofutsanyana District public libraries a centre of attraction in the community. Also, it is an indication that commons users share different resources that support the diverse information and other engagement necessary to stimulate learning in the commons.

(h) Acquired digital skills in the commons

Majority (39.9%) of the commons users acquired some digital skills from some people they meet, and this finding corroborates with the studies by Beagle (2006); National Library of South Africa (2016) which revealed the importance of acquiring digital skills in the libraries. When considering digital skills gap, the researcher is of the view that some of the commons users acquired digital literacy from other users which enabled them to use IT in their commons in the libraries. However,

others still need to be taught such skills so that they can be in the position to assist or capacitate others. This finding is in line with the study of (Spires, Paul & Kerkhoff 2018).

8.3.9 Identifications with digital literacy

Majority of the library users are using digital skills to improve their digital literacy. It is believed that users utilize digital technologies in the commons to facilitate their interactive learning. Digital literacy is needed as a motivation to use digital devices, such as internet to access information among others in the commons in the libraries. The study revealed a significant relationship ($\beta=0.539$, $p=0.000$) between commons' impact on digital literacy and users' motivation for engagement in the commons. Therefore, the null hypothesis was rejected.

(a) The commons is already fast-tracking digital literacy and might fast-track digital literacy in the future

Majority (43%) of the commons users indicated that the commons were already fast-tracking digital literacy in the commons. Furthermore, majority (47.5%) of commons users confirmed that the commons might fast-track digital literacy in the future in their libraries. This is a positive reaction because the results showed that majority of the commons users are youths who are technological savvy. Also, these users can attest to the rapid advancement of digital literacy in the commons. This finding correlates with the study of Spires et al (2018) which defined digital literacy and its changing nature in the libraries. This is an indication that commons are already developing digital literacy which will capacitate IT capabilities in the commons.

(b) The commons is a distraction to digital literacy

Findings of this study revealed mixed thoughts about commons being a distraction to digital literacy. The results revealed that (30.4%) of the commons users strongly disagreed that the commons was a distraction to digital literacy. However, based on the finding from the same study, 19% of the commons users agreed that commons was a distraction to the digital literacy. Previous studies by Gundersen and Røgler (2016); Wyatt, McQuire and Butt (2015) reported similar study. The advent of knowledge commons in the nine selected Thabo Mofutsanyana District public libraries through Mzansi Libraries On-line Country Grant projects implicated a high contributing

factor to digital literacy in the commons, even though some of the respondents affirmed their distraction.

(c) Addressing mind to digital literacy

Next, findings of this study also reveal that (24.1%) of the commons users were yet to address their mind to digital literacy. This finding postulates a positive reaction since majority of commons identified how commons already fast-tracking their digital literacy even in the future. It is evident that the participating public libraries need to work on their digital contents in order to improve the digital literacy.

8.3.10 Digital skills and creative competences developed in the commons

Digital skills develop digital literacy and creative competence which provide users the ability to locate information by using digital tools in the commons. However, the word “literacy” refers to the ability to read and write. Beyond that, adding “digital” to the word “literacy” makes it more complicated. Digital literacy like information literacy requires users to have skills to identify, locate, access, create and evaluate information in the digital world (ALA 2021). The study revealed a significant relationship ($\beta = 0.709$, $p = 0.000$) between motivation for engagement in the commons, and digital literacy and competence of the library users. Therefore, null hypothesis was rejected. The result showed that digital skills provided the users with the motivation to engage in the commons with the purpose of meeting their information need.

(a) Use of digital technologies

The findings from Table 7.5, clearly indicate that majority (43%) of the commons users used digital technologies to acquire digital skills and creative competence in the commons. This corroborates the studies of Beyond Access (2012); Ferrari, Punie, and Redecker (2012); Khan and Bhatti (2017); Matobako and Nwagwu (2018); Singh and Pinki (2009); UNESCO/IFLA (2018) who indicated the importance of use of digital technologies in the libraries. This finding is also in line with the study of Chisenga (2004) which states that ever since Johannes Gutenberg invented mechanical movable type printing in 1439, digital technologies, particularly modern ones, are the greatest things that has ever materialized to the library sector. This finding also agrees with the study by Khan (2016) which indicated that the availability of ICTs in the commons enhances the

digital competences, IT capabilities, and benefits the commons users. Therefore, it is evident that there is monitoring and assessment of digital literacy associated with competences developed from information literacy, internet literacy and computer literacy in the commons in the libraries.

(b) Use of free and open access resources

Majority (43.0%) of the commons users indicated that they developed digital skills and creative competences through the use of free and open access resources in the commons. Velmurugan (2013) who examined institutional digital repository system with special reference to DSPACE software in digital libraries. This implies that accessing of online publication is now easy with the advent of digital resources in the commons in the libraries.

(c) Use of FOSS

Table 7.5 revealed that majority (41.1%) of the commons users acquired digital skills and creative skills on how to use FOSS in the commons. The studies by Benkler (2002); Boyle (2003); Hess and Ostrom (2007); Kranich and Schement (2008) guarantee that most of open-source software are freely accessible and available. To add on that, study by Velmurugan (2013) also indicated values of using open-source software in the digital libraries. His study further indicated that FOSS reduce vendor lock-in and also assist libraries with lowering the growing costs among others because is freely accessible. This implies that open-source software allows commons users to work without restrictions and payment of royalties as long as they are still within the open-source community (Kranich 2004). The study by Ferrari et al (2012) revealed that during the management of digital information systems, digital competences aspects such knowledge and skills, including attitudes and most importantly, digital literacy is required.

The findings revealed that few of LOs state that open access resources built by their respective libraries, were useful information which was preserved in the folders, and the same group of respondents, also indicated that they use Linux which is a FOSS and electronic manuals for community use. Interestingly, the same findings revealed that majority of respondents pointed that there was no open access being built or electronic manuals in their respective libraries. This is an indication that libraries must work on their repository system in order to create digital commons

as a method of preserving electronic manuals, and also to consider FOSS as a way to strategize the information received from their new technologies.

(d) Use of social media

Most (38.6%) of commons users used social media as one of the digital skills and creative competences in the commons. This study corroborates with the studies of Bakare, Yacob and Umar (2018); Chauhan (2017); Kasimani and Kasilingam (2019); Matobako (2016); Matobako and Nwagwu (2018) which explored the usage of social media in the public libraries. This implies that even though social media is used to improve digital skills and creative competences, it is also a powerful tool for knowledge sharing in the commons in the libraries.

(e) Use of internet

Findings revealed that digital skills and creative competences were acquired through using internet which was verified by the highest proportion (59.9%) of commons users. Furthermore, this study was not in agreement with a study by Beyond Access (2012) which revealed that even though skills for acquiring internet showed a high strongly agreed, however, it is only accessible to about (35%) of the worlds' population of 7 000 000 000, which show a concern in the provision of information. However, based on the findings of similar studies, ALIA (2013); Matobako (2016); Matobako and Nwagwu (2018) showed that library users used internet in general when they were visiting their libraries. Also, the findings of this study correlated with the studies of Pujar and Satyanarayana (2015); Sahin, Balta and Ercan (2010); Singh (2013); Singh and Nazim (2008) which examined the access and use of internet in the libraries. The internet provides easy access to resources and also improves digital literacy skills that occupy different spheres of people. The researcher is in the view that internet shares information and knowledge to meet and satisfy the information needs of the commons users.

(f) Other literacy, not necessarily digital

The findings also revealed that there were most (34.2%) of the commons users who indicated that they acquired digital skills and competences through other literacy, however, not necessarily digital. The study also agreed with previous studies conducted elsewhere by Beyond Access (2012) in Chile, Jamaica, Uganda, Moldova and Poland. While similar study was also conducted by

Chisenga (2004) in Africa and ALIA (2013) in Australia about a positive impact about accessing ICTs with access to internet in the libraries particularly, public libraries. This suggests that though commons users acquired digital skills, it shows that commons users have achieved other skills and competences in the commons in the libraries that were not necessarily digital.

8.3.11 Meanings users attach to their engagement in the commons

(a) Making friends in the commons

Findings show that majority (41.1%) of the commons users indicated that making friends in the commons was one of the means they used to attach to their engagement in the commons. This is an indication that libraries cater for all members in the community. Therefore, commons inside the libraries must be made information hubs where people interact, share and also learn from each other. Also, libraries are essential for development and information, hence, they equip users with literacy skills and lifelong learning. This signifies that library services must not only provide materials and resources, but also be conducive for users who are meeting and making friends for the sake of supporting education activities.

(b) The commons as a place to meet people

Most (50%) of the common users met people who might have assisted them to solve their learning related problems in the commons in the libraries. The findings support the study by ALA (1996-2020) which affirmed that some community members used the library as a better place to meet friends or families. This is an indication that libraries are social spaces where the users learn and develop by interacting with others. This implies that commons in the libraries is a place to meet people and also develop social connections.

(c) The commons as a place to pass time

The results of the study showed that (25.3%) of the commons users believed that commons was not a place to waste time, hence it was one of the means and motivations they attach to their engagement in the commons in the libraries. This is an indication that libraries have advanced; they do no longer resemble book-depot like in the previous years. Similarly, the results show that the same number of commons users (25.3%) said that the commons was a place to pass time. It is

also evident that libraries attract community members because they are regarded as the best spaces in the community to hang out and relax. The advent of new technologies in the commons in the libraries, offered community services and features they might not possess and afford at their respective homes, hence in the researchers' view, they visited the commons in the libraries to hang out and pass time.

(d) Self-directed learning

Majority (50%) of the commons users confirmed that engaging themselves in self-directed learning was one of the meanings and motivations attached to their engagement in the commons. This suggests that libraries are gradually becoming centres for self-directed learning in the 21st century. The researcher is of the view that digital literacy acquired in the commons capacitated commons users to take learning initiatives without or with help of others. This study corroborates with studies by Guglielmino (2013); Silen and Uhlin (2008); Towle and Cottrell (1996) who examined the concept of self-directed learning, including the Auburn Public Library (2020) which assists their users with self-directed learning programmes.

(e) The commons as a distraction to normal library services

Some (31.6%) of commons users considered commons as a distraction to normal library services. While some commons users described commons as a distraction to normal library services, there were some positive findings which indicated that majority of commons users asserted that commons was not a distraction normal library service. The aforementioned findings corroborate with the studies of Kumbar (1996) cited in Uddin and Hasan (2012); Singh (2013) who revealed that the emergence of IT trends, influenced how traditional libraries operate, leading them to evolve their library services, hence this study discovered that other respondents reported that commons were distraction to normal library services. Also, the study of Heitner (n.d.) revealed that technology is a distraction. This explains that even though libraries are considered as community hubs that are focal points in their communities due to the advent of new technologies, some community members were still referring to them as distraction to their traditional library services.

8.4 Biophysical conditions

8.4.1 Transformations in the library

(a) Global transformation

Findings revealed that most of the community leaders reported that their libraries had successfully conformed to global transformation and that the advances have been satisfactory. On contrary, the remaining respondents presented that these libraries were still in the process of transforming, and they have not yet reached the global standard successfully. Research by Hirsh (2018) confirms that the libraries are undergoing a rapid transformation, yet they are still not completed with the transformation processes. This finding also corroborates with the study by Wenborn (2018) which confirmed that adopting new innovations and technologies allows libraries to collaborate globally and it will give them an opportunity to work towards one goal. This study agrees with Coalition for Networked Information (2020) when reported that globally, libraries have transformed, and they are benefiting from new technologies which forced them to create new partnerships in their respective communities. Therefore, this is an indication that through Mzansi Libraries On-line Country Grant projects, public libraries are gradually embracing ICTs in their execution of the functions of providing information resources and services, and enlightening users more than ever before.

(b) Recent transformation

Furthermore, with regards to recent transformation in the nine participating Thabo Mofutsanyana District public libraries, a wide variety of examples were provided to buttress this factor. Most of the CLs affirmed that the library technology infrastructures have improved. The findings revealed, included; gaining further detailed information via the internet on an increased number of library computer, using the free internet for obtaining most of study materials, self-development, then, internet improved in terms of speed. Few of the respondents also buttressed their opinions about the recent transformation and stated that computer classes and photocopying machines were available, and that the library hall was used for social development activities. This is an indication that rapid growth of information technology, particularly, the internet and associated technologies, has opened up an entirely new medium for providing improved open access for research purposes, information services and resources for the user in public libraries.

This finding is in line with the studies by Connolly, Fredrickson, Millar and White (2019); Joseph and Mohan (2010); Michalak (2012) which supported the fact that libraries have transformed because their library services and their user expectations have changed due to the emergence of new technologies. This implies that libraries must look into their physical condition of library buildings when they want to provide equal resources and services to all members of the community (Irvall & Nielsen 2005). The findings of this study also showed a concern about a lack of special services in some of these public libraries to people with disability. This finding is similar to the study by Chaputula and Mapulanga (2016) which also investigated the provision of library services to people with disabilities in Malawi. Negatively, another related factor regarding recent transformation was the fact that internet speed had slowed down due to the increase of digital resources. This implies that even though there is evidence of transformation within these libraries, there is still work that needs to be done in order to meet the diverse needs of all the common users.

Hence, the majority of CLs affirmed that there was an ongoing transformation which included the existence of toy libraries in their respective libraries. Following this, it was also revealed that computers provided more assistance than books; however, there were areas that still needed improvement such as, relevant books and ICTs including computers and tablets. This finding is in line with the study of Girakaduwa (2019) which reported that respondents' challenges were triggered by the lack of library materials, such as electronic and non-electronic resources, lack of infrastructure facilities, inadequate awareness programs, among others in the libraries. The results also indicate the concern about library opening hours and opening on Saturdays. Next, few of the CLs reported that some community members were not aware of available library services, as well as their expectations of government-sponsored library upgrades, the need for workshops and training for community empowerment, and the expectation of children to be empowered academically by the libraries.

8.4.2 Physical or observable items in the commons

(a) Books and Articles

The findings reveal that books and articles were available and attractive in the nine participating public libraries, however, some of them were considered to be outdated. Majority of the respondents affirmed that books are very attractive resource that constituted a major attraction in the commons. This is an indication that books bring opportunities that are in line with literacy. Furthermore, the availability of books in commons promoted reading skills which created understanding of new knowledge that can be used to solve day-to-day problems. The finding supports the studies by Issa (2009); Skarzynski and Nassimbeni (2016) which revealed the impact and purpose of books in the library. Also, majority of the respondents reported very highly that articles attract them to the commons.

The findings corroborate the study by UNESCO/IFLA (2006:340) which reported that the artefacts such as books and articles are traditional knowledge and are rivalrous. While previous studies by Lohar and Kumbar (2002); Matobako and Nwagwu (2018), revealed that there were still library users who are relying on traditional library services not electronic services. This is an indication that some of the users preferred to visit the library to use books or articles for current information and still circulate those library materials.

(b) Computers and Tablets

Majority of the respondents reveal that they were attracted to the ICTs including computers and tablets with free internet access in the commons, even though they were not always operative, available or accessible to accommodate their increased numbers. This study supports the report of Statistics South Africa (2013) which regarded computers and tablets as part of the national economy, thus the majority of respondents indicated a high expectation that computers and tablets influenced their presence and usage in the commons. The findings also corroborate with the studies by Hussain and Lavanya (2014); Khan (2016); Matobako (2016); Matobako and Nwagwu (2018); Singh (2013); Singh and Nazim (2008) which indicated the impact and role of ICT in the libraries. This implies that computers and tablets shape the services libraries offer, therefore, they constituted a major attraction in the in libraries and impacted users' digital literacy.

(c) People

Findings in Table 7.7 showed that people were also one of the items that attracted most (32.9%) of the commons users in the commons in the libraries. This positive reaction possesses the significance of people in the commons. Also, the finding of this study corroborates with the study of Vestergaard (2020, par.8) which mentioned that modern libraries are considered a community space which attract people in their diverse nature. Public libraries have to increase their positive impact on developing people in the commons so that they can attract and reach more of them.

(d) Other categories

Lastly, most (33.30%) of the respondents revealed that there were other artefacts besides the aforementioned resources that attracted them to the commons. It is evident that these libraries are established to render various non-electronic and electronic services and preserve other physical resources which also attract commons users and satisfy their information needs. However, the same finding, indicates again (33.30%) of the commons users been undecided about mentioning other categories as physical resources attracted them in the commons.

8.4.3 Non-physical artefacts that attract users to the library

One of the significant criteria of the library is to evaluate non-physical artefacts that attract the users to the commons. The rapid transformation of IT compelled libraries to use internet and other related artefacts to provide information in the print and digital format to meet the information needs of their diverse users. Also, these libraries have to develop trainings to increase digital literacy so that the commons users can be able to access the non-physical artefacts. Furthermore, the study revealed a significant relationship ($\beta = 0.475$, $p = 0.000$) between non-physical material of the library and the perceived commons' impact on digital literacy among the library users. Therefore, the null hypothesis was rejected. This result implicates that computers and tablets developed the digital literacy of the commons users who were using the ICTs in the commons.

(a) Internet

The internet is becoming an integral part of the transforming library sphere. Therefore, a high proportion (76.6%) of the commons users were attracted to the internet in the commons. This is

an indication that internet has revolutionised the ability of physical resources available to render necessary library services to the spectrum of users, though other respondents were concern about its speed. This finding is in line with the study by Singh (2013) which asserts that emergence of internet transformed library physical to virtual services environment. Also, this finding supports the study of Chisenga (2004) which highlighted the fact that modern libraries have increased their various libraries services utilizing multitude of media. Furthermore, the findings of this study also corroborate with the studies of Matobako (2016); Matobako and Nwagwu (2018); Nwagwu, Adekannbi and Bello (2009); Pujar and Satyanarayana (2015); Sahin, Balta and Ercan (2010); Singh (2013); Singh and Nazim (2008) which revealed the impact and influence of internet in the public libraries.

(b) Social media

Most (38.6%) of the commons users were attracted to social media in the commons in the libraries. This implies that social media was a potential tool in promoting non-physical resources in the commons in the libraries. Similar study was conducted by Matobako and Nwagwu (2018) which explore the usage of social media in the public libraries of Mangaung Metropolitan Municipality. Also, the findings of this study correlate with the studies by Bakare et al (2018); Chauhan (2017); Kasimani and Kasilingam (2019); Veletsianos (2016) which examine the use of social media in the libraries and also to promote library services. On a contrary, the study by Amina and Nwanne (2015) investigated specifically the challenges encountered by library officials in the use of social media.

(c) Press Reader – digital newspaper and magazine

Findings show that majority (37.3%) of the commons users were attracted to electronic resources using Press Reader in the commons in their respective libraries. This explains that these public libraries were offering periodicals in the form of electronic resources to meet the current technological needs of the community. This finding corroborates with the studies by Akussah, Asante and Adu-Sarkodee (2015); Tenopir, Hitchcock and Pillow (2003) which focused on how users are using electronic resources in the libraries. This signifies that access to information in the electronic media relates significantly with learning about what is happening around the world, and provides positive reaction which increases the usage of resources in the commons.

(d) Overdrive (library e-books)

Few (25.3%) of the commons users indicated that they were attracted to overdrive service in the commons. This explains that overdrive provided commons users access to electronic books at their convenient space and time, even outside the library facilities. However, based on the same finding, it was revealed that the same amount of (25.3%) commons users were undecided about the overdrive service as a major attraction in the commons in their respective libraries. This is not a surprise because overdrive is the new tool libraries utilize to assist their users and non-users to access electronic materials inside or outside the knowledge commons spaces.

(e) ProLib library system

ProLib is the free library system that is used specifically by the Free State Library Services to store all library resources information. Majority (29.7%) of the commons users were undecided about the ProLib library system as one of the non-physical artefacts that made information available and constituted a major attraction to the commons. It is evident that these public libraries must promote and improve services provided by ProLib library system for the benefits of commons users. Also, libraries have the responsibility of ensuring workshops and trainings based on ProLib library system to all commons users.

(f) Online Public Access Catalogue (OPAC)

Also, most (31.6%) of commons users were undecided that OPAC which presents online bibliography of a library collection was a major attraction in the commons in the libraries. This is disturbing because access to these participating library data bases could have been easier and faster through the use of that automated catalogue. Previous study by Kumar and Singh (2017) also revealed problems raised and asked by majority of respondents about OPAC in the library. This implies that libraries must prioritize automated catalogue as an access tool on which they can stored their library data bases to enable easy and quick search inside and outside their physical infrastructures.

8.4.4 Content that make the commons a major attraction

(a) Communication – accessing of personal emails

Findings showed (52.5%) majority of the commons users affirmed that they accessed personal emails in the commons. This is a positive reaction since it was confirmed that Thabo Mofutsanyana District had the highest unemployment in the province that was the reason why majority of commons users utilised the communication technology to exchange their messages through the electronic format to access their personal emails. The finding of this study supports the study by Arya and Takukdar (2010) which observed the use and effectiveness of internet services including accessing of emails in the Delhi College of Engineering Library and indicated that emailing and chatting has been one of the services that has been rated very highly by library users. This study also corroborates with the study by Kumar and Singh (2017) which discussed the use of ICT and library operation. This entails that the impact of ICTs and the emergence of commons enabled these public libraries to improve their web related services to achieve their users' needs.

(b) Knowledge from electronic documents

The study revealed a significant relationship ($\beta = 0.763$, $p = 0.000$) between access to knowledge published in the electronic space and learning stimuli. The null hypothesis was therefore rejected. Precisely, (47.5%) of the respondents were attracted by knowledge from electronic documents in the commons. Public libraries are becoming spaces for knowledge creation and learning stimuli, and for that reason, changes such as open access has a profound impact in accessing knowledge published from the electronic documents. This is an indication that open access changed the idea of library collection and also assisted with the effective dissemination of information and knowledge needed to support learning in the knowledge commons. Knowledge from electronic documents expands the opportunity to gain access to educational materials at any given time even outside the library's spaces.

(c) Education – computer classes

Most (38.6%) of the commons users rated computer classes very highly as content that made commons attractive to them. Computer classes develop digital skills and effective opportunities on using ICT to access online information resources and services in the libraries. This finding

supports the studies by Alleman (2018); Islam and Islam (2007); Wilkinson and Lewis (2006); Xie and Bugg (2009) which evaluated a public library computer training program, while the study of Bradley (2007) examined the challenges that hinder the development of ICT in the libraries which one of them was lack of ICT training programs. This signifies the fact that public libraries should develop computer training schedules to strengthen and capacitate the digital literacy and competences of the commons users.

(d) Accessing the library websites

Most (31%) of the commons users were not accessing the library website hence it was not very highly rated as a content that constituted the major attraction to the commons in the libraries. With the arrival of new technologies in these public libraries, library website is a marketing tool to promote and provide useful library information and services. This is in line with the findings of Sahu (2017) which discussed the importance of library website.

(e) Digital experience – online gaming

Few (25.9%) of the commons users were undecided about digital experience – online gaming as a major attraction in the commons. This finding corroborates with the study of Chen (2015: 3.1) who analysed the emergence of online games which involves disparate disciplines, and realized that the research themes around online games study are still not certain even today. This entails that out of the contents that made the commons a major attraction in the libraries, there is a big gap when it comes to the online games as an important digital experience, hence it was not very highly rated by majority of the respondents. Public libraries have a mandate to entertain and educate commons users. Therefore, the researcher is in the view that online games encourage digital literary value because commons users can read, write and learn through playing on ICT equipment.

8.5 The commons community of the library

8.5.1 Roles of commons community in the commons

(a) Using resources that already exist in the space

A large number (84.4%) of the commons users visited the commons to use the resources that were already existing in the space. It is therefore important that public libraries should have an extensive

collection to cater for the increased number of their users. This finding is in line with the studies of Jamil, Tariq and Jamil (2013); Owusu-Acheaw and Larson (2014) which investigated the availability of effective use of the existing resources in the libraries. According to the study of Ezeala and Yuff (2011), humans by nature like to evaluate things and materials; hence public libraries are also evaluated by their users. This is a pointer to the fact that existing library resources attract more users to their space than ever before so libraries have to measure how they interact with information.

(b) Providing resources required to make the commons rich

Majority (39.2%) of the commons users were undecided about providing resources required to make the commons rich. This is an indication that public libraries should establish healthy relationships between themselves and their communities so that community members can understand the value of providing resources to upgrade their libraries.

(c) Provision of policy ideas to the library

Majority (43.1%) of the commons users did not provide any policy ideas to their libraries. Provision of policy ideas to the library plays a vital role because it deals with the set of rules, conditions including regulations among others that govern the entire library resources, management and services. The study therefore suggests that public libraries should include their users when planning and establishing policy framework for management and development of library systems. Previous study by University of the Witwatersrand (2006) also indicated that ICT policies were available; however, the university library users did not provide ideas or formulate them. Interestingly, the findings showed a disparity, although majority of respondents claimed that they visited the commons to use existing resources and provided resources to make them rich, a provision of policy ideas was otherwise.

(d) Assistance and roles played by the community in the commons

Furthermore, majority of the respondents indicated that their communities did not play a role or support the commons, except CWP workers who were assisting in terms of cleaning and maintaining the libraries. It was also indicated by only few of the respondents that they took part in supporting the commons as community members. Also, the result of this study was in line with

the study of Sung and Hepworth (2013) which examined community engagement related concepts in public libraries. This identifies that community involvement and their role to support and develop the libraries is very critical, however, is not yet supported by majority of community members.

In addition, majority of the respondents were of the view that, if as a group of individuals in the community could respectively work together as a unity, particularly in terms of expressing the community opinions using suggestion boxes, digital transformations, acquisition of new books and materials among others, increasing the number of digital resources such as, computers and tables, their libraries would be developed rapidly and effectively, and it will be owned by them. The results agree with the study of Powell (2014) who presented the '*Geek the Library*' campaign to increase awareness in the community about many services and the value libraries can bring to their communities. Subsequently, elaborating on the ignorance of the community, one respondent exclusively reported the passiveness of the community for not knowing that the library is a facility that belongs to them. Hence that affirmed the reason why they were not supporting or assisting it. This is an indication that the libraries are challenged because they must remain relevant in their communities. They must market and increase advocacy about their services in order to attract more users, and also meet their information needs.

8.5.2 Library community

Findings showed that majority of the respondents revealed that school children, university students and unemployed individuals were dominating in terms of the new library community. The results of this study indicated that younger people were utilising library services more than the other members in the community because they were attracted to the new technologies. On the same note, it was revealed that these public libraries were also serving mix of members from various communities even though they were less frequently mentioned, governmental departments, businesses, religious people, people with disabilities, farmers, elderly citizens, including CPW workers. This suggests the fact that public libraries should try to market their services and activities to other members of the community.

8.6 Participating in making rules and regulations for the commons

8.6.1 Rules and regulations of the commons

(a) Day-to-day operations of the commons

Findings showed majority (57.6%) of the commons users indicate that they did not participate in making rules for day-to-day operations in the commons. It is important for the libraries to understand that traditional library and commons develop a new form of shared resources and services. Hence, this finding resonates the study of Hess (2008) who posited that commons are still in its infancy, they impose institutional change or new governance institutions that rule the commons. The finding of this study also correlates with the studies of Kranich (2004, 2008) which described that a proper governance is a mechanism to control over resources in the institution. The finding also agrees with the study of Williams (2018) which pointed out that according to Ostrom, people are likely to adhere and comply to rules if there was a participatory decision making which involved them. The finding of the study is in line with the University of Reading (2020) when it attested that its rules and regulation were framed by the university librarian not library users. Hence, participation in making rules and regulations in the commons is important because rules are shared.

Again, majority of LOs confirmed that there were rules and regulations guiding the use of commons, however, users were not involved in making them. It was also revealed that LOs stated that rules and regulations were visible enough to be seen in the commons, while majority of users disagreed with it. This is an important factor because the involvement of the users during the making of rules and regulations will lead to the abidance and compliance of the very same rules in the commons.

(b) Operational rules of the commons

Majority (56.3%) of the commons users confirmed that they did not know one of the individuals that interacted to decide the operational rules. Rules are important and matter in every level of the library management. Operational rules affect who may accept rules and what is accepted in the commons because they set certain requirements and guidelines. This finding is in line with the study of Hess and Ostrom (2007). This study also suggests that individuals should be informed

and/ or interacted during the planning of operational rules to avoid lack of awareness and understanding of such rules.

(c) Collective choices

Also, findings showed majority (60.1%) of the respondents who were undecided about who may make collective choices for the commons, while majority (56.3%) had no idea about that factor. This is an indication that most of the commons users were not involved when libraries formulate these multiple levels of rulemaking (Hess & Ostrom 2007). This explains that these libraries have a weak system when it comes to the implementations of the institutional changes.

(d) Other categories

Next, majority (60.1%) of the commons were undecided about the other factor of participating in making rules and regulations for the commons. This is an indication that majority of commons users were not involved during the making of library rules and regulations for the commons. This study suggests that rules should be flexible and inclusive of users to ensure compliance in the commons.

8.6.2 Intellectual Property Rights

Majority of the respondents revealed that no legal issues had ever been encountered concerning IPR, subsidies, contracts, antitrust provisions in the commons, and that issues of IRP have been also taken into considerations. Also, majority of the respondents revealed that commons addressed the problems that might arise out of IRP. This identifies a good practice of IPR in the commons. This finding is in line with the study of Hess and Ostrom (2007) which opined that true commons consists of IPR aspects, and that libraries especially public and academic are experiencing new IP legislation issues which mostly challenge the digital information in the commons.

8.6.3 Library policies

Majority of the respondents revealed that there were no new library policies regarding managing the library in the event of the emergence of the commons. However, only new policies were new

tariffs, extended time allocation to access free internet. It is clear that respondents have different opinions regarding new policies in their libraries. Majority of LOs further mentioned that if there was any policy, Free State Department: Sport, Arts, Culture and Recreation were responsible for making that policy not community members or library users. However, most of the users indicate that employers, library officials or politicians were also responsible for policy making. Next, majority of the LOs indicated that there was a good response, roles and reactions from the community of users in this new development from Free State Department: Sport, Arts, Culture and Recreation, while others reported poor response even from the community. This finding is in line with the study by Goulding (2009) which was conducted to explore the community engagement in UK within the public library framework. This is a clear indication that most of the respondents were not aware of who the policymakers were, and what response and role did the community of users and policymakers played in terms of the new development in the commons.

8.6.4 Awareness of rules in the commons

Public libraries are regarded as the busy information centres in the communities. They are well known as hubs that provide easy access to ICTs and other services to meet the information needs of the users. Probe further, the study revealed a significant relationship ($\beta= 0.392$, $p =0.000$) between users' awareness of rules of the commons and commons' outcomes. The null hypothesis was therefore rejected. Therefore, it is important for these libraries to ensure that users are aware of the general rules and regulations of the commons in the libraries so that they must comply and abide to them.

(a) Accessing the commons

Commons are available resources that are shared and owned by nobody. Majority (70.9%) of the commons users were aware of who may access the commons. This finding is consistent with the study of Madison et al (2016) which indicated that commons are libraries and are regarded as public not private goods, hence provision to access information and learning should be a common factor. This is a positive reaction when commons users acknowledge the fact that commons have to be accessible and also knowing who may or not access it. The finding also agrees with the study

of Hess and Ostrom (2007) which discussed types of property rights including who has the rights to access the defined physical area.

(b) Managing the commons

Findings showed majority (55.1%) of the commons users who indicated that they knew who has the power to manage the commons. This finding resonates with the studies of Ciriacy-Wantrup and Bishop (1975); Hess and Ostrom (2007); Schlager and Ostrom (1992) which indicated who has the right to manage internal use of commons in the libraries. It is clear that commons users were aware of who may manage the commons and improve them. Therefore, the study suggests that public libraries should make commons users aware of common property regimes that regulate the management of resources in the commons and rules that govern commons which will enforce compliance.

(c) Contributing to the commons

In this survey, (49.4%) of the commons users indicated that they knew who should contribute to the commons. It is a common factor that users were aware of who may contribute and also what resources need to be contributed. This finding corroborates with the study of (Hess & Ostrom 2007). This implies that contributing to the commons build towards an organizational digital repository and also in preserving the digital commons. Most of the respondents were aware of the rule for contributing resources to the commons. The public libraries must make these rules visible so that the users can see and adhere to them.

(d) Excluding others from accessing the commons

Majority (41.8%) of the respondents indicated that they did know who could exclude others from accessing the commons, while other respondents were not aware of it. On the same note, library officials indicated that they were responsible for that function. This further support the fact that awareness of some rules in the commons were not reasonably known, and might affect the management of commons in the nine selected Thabo Mofutsanyana District public libraries. This finding supports the studies of Ciriacy-Wantrup and Bishop (1975); Hess and Ostrom (2007) which explored the governing of commons and common property as well as open access regimes.

Library officials have to be aware of the fact that common property-rights articulates who should exclude others from using the resources in the commons.

(e) Extracting or removing of content from the commons

Most (39.9%) of the commons users indicated that they knew who could extract or withdraw contents from the commons. On the other hand, majority of CLs confirmed that Free State Department: Sport, Arts, Culture and Recreation were responsible for extracting or removing of content from the commons in their libraries. This finding iterates the study of Hess and Ostrom (2007) which pointed out that the right to extract or remove content from the commons may be transferred within the commons. It is important to know and understand the common property-rights in the commons and their consequences results.

(f) The right to sell or lease content from the commons

Findings in Table 7.12 also revealed that most (36.7%) of the commons users knew who has the power to sell or lease content as stipulated by the commons. This finding is in line with the study by Schlager and Ostrom (1992) which indicated the confusion over what rights are involved in ownership. Public libraries should make their commons users aware of the rules that govern the commons so that they do not suffer the tragedy of the commons. Therefore, common property-rights have to be well- defined in order to prevent the overuse of resources in the commons.

8.6.5 Governance in the commons

(a) New governance in the library

The study revealed a significant relationship ($\beta= 0.216$, $p =0.043$) between users' assessment of the services in the commons and participation in the governance of the commons. Therefore, the null hypothesis was rejected. Majority of the LOs revealed that commons imposed new governance system, while others were of the view that there were no new governance systems in place in their respective libraries. This is an indication that people have different views about governance in general. The new governance system in most instances imposes or influences the existing governance system. This finding is in line with the study of IFLA (2018) which reported about the significant of good governance in the libraries.

(b) Self-governance mechanisms

Next, findings showed that all LOs except few, indicated that there were self-governance mechanisms in place in terms of membership rules, resource contribution and extraction requirements, conflict resolution mechanism and monitoring rules, as well as sanctions for rule violation in their libraries. Also, they explained that the rules concerning membership, conflict, monitoring and sanctions for rule violation were communicated to their users to prevent sanctions for rule violation. This is a good indication that libraries encourage a good behaviour among their users to protect the commons. With regards to resource contribution and extraction requirements, Free State Department: Sport, Arts, Culture and Recreation was responsible for that factor. The findings of the study support the study conducted by Salman, Mostert and Mugwisi (2018) who also explored the governance matters that influence service delivery in public libraries in Nigeria. This implies that self-governance mechanisms are available and practiced in these libraries. This is in line with the study by Ostrom (1990) which indicated conditions which are necessary for self-governance, while, the study of Bedford Public Library (2013) also reported procedures enforcing compliance in terms of users who breach the regulations and violate library rules.

In addition, findings showed that majority of LOs indicated that administrative and other costs involved in constructing, monitoring and enforcing compliance with rules were only implemented when there was a loss of library materials. On the other hand, it was indicated that ever since the emergence of commons, libraries had never experienced such occurrence, except when there was a loss or damage of library material. This explains that users understand some of self-governance mechanisms operating in the library and adhere to them. This reflect a good practice since the results of the study identified that the majority of users visiting these libraries were children and youth.

8.6.6 How norms, rules and laws that control management of library services have been influenced

Majority of the respondents indicated that the practiced library norms, rules and laws have been influenced because there was a change of rules in the commons. Factors such as registering before accessing the internet and certain behaviour such as eating and drinking in the library, and other services in the commons were also influenced. This implies that there was a rule in the commons.

This is also a clear indication that the emergence of knowledge commons influenced the old practice of norms, rules and laws that controlled management of library services. However, there was also a concern about these rules for not been made visible enough to library users in the libraries. On that note, other libraries should make it a point that all rules and laws are visible and also clarified to all library users to enforce compliance.

8.6.7 Changing of norms, rules and laws in the commons

Findings showed majority of respondents suggesting that if they would change anything in the commons, it would be the norms, rules and laws pertaining to the interactions between users and officials. This is an indication that the manner, in which the users and officials interact and build relationships, has either a negative or positive impact on the services in the commons. Furthermore, majority reported more suggestions which among others included the review of rules in general, clear written rules which are visible to all, library hours and opening of Saturdays and permission to eat in the activity hall. Unclear and invisible rules and regulations are becoming a disturbing trend in the libraries. Therefore, to remain relevant to their users, libraries have to make their rules and regulations clear and visible to all of their libraries. Training of library officials was also mentioned as one of the factors that were suggested to improve or change the commons. In view of the above, it is clear that training for officials is needed to improve their skills in order to manage the commons successfully. This implies that respondents are willing to contribute more ideas to improve governance in the commons in the libraries.

8.6.8 Recommendations in respect of norms and rules that guided the use of the present-day library

The study revealed recommendation of sufficient spacing to separate adults and children in the commons. Managing noise level requires libraries to reconsider their physical structure to allow children to learn through playing without disturbing other library users. The study also revealed recommendation of extended library hours including half days on Saturdays. The extension of library hours and the opening of Saturdays are becoming disturbing trends because they were mentioned several times in the study. That is; most of the learners visited these public libraries after school, did not have enough time to complete their school assignments. The same challenge

also affected employed users who cannot access the public libraries during the day because they were at work. Hence it was recommended that libraries must be opened as well on Saturdays to accommodate all.

Other recommendation revealed by the study included recalling of meetings between the libraries and stakeholders. It is evident that collaboration with stakeholders contributes on the organization's success and development. Therefore, by engaging stakeholders, these public libraries will get assistance in terms of practical and financial support which will sustain the life span of the commons. The study also revealed recommendation of addressing an issue of community engagement when formulating library by-laws, rules and regulations. Community engagement and involvement advocate library awareness, and also improve compliance of rules and regulations because communities are part of the library decision making. This implies that public libraries must establish local network of community members to improve their governance.

There was an existence of security guards to ensure that resources, users and officials were safely secured in these public libraries. However, safety in public libraries will always be a concern. Therefore, the study revealed a recommendation of the installation of weapon-detection system to ensure and maintain safety in the commons. Furthermore, the study recommended a practice of equality in the commons. Equality is practised when all users are at the same level of accessing the same opportunities in the libraries.

8.7 Action arena

8.7.1 The antecedents of the commons in the library

Findings showed majority of the LOs uttered that their libraries were previously preserving limited materials including books but changes with new technologies transformed their libraries into a place of various benefits. The finding of this study supports the study of Webster (2019) which indicated that in order to avoid negative antecedents; libraries should inform their users about any change, development or daily schedules ahead of time. The findings also revealed that outside spaces in the libraries could be useful in accommodating more users to avoid over population in the commons.

This finding is in line with the study by Hardin (1968) which addressed the issue of over population in the commons. In essence, it is evident that the emergence of commons in these libraries had made it difficult for library officials to manage commons users effectively, because they suggested that outside spaces should be used to accommodate some of the commons users. This is an indication that commons created an extra work to the library officials which triggered threats or anxiety that might hamper a high-quality service delivery. This also implies that libraries must be in the position to identify antecedents and be able to extend their resources and services to accommodate various activities existing in the commons.

8.7.2 Stories of the creation and operation of the commons in the library

Most of the LOs revealed that commons in their libraries were transformed and larger than before with added digital resources because they could not accommodate more users, however, more services have been added to the array of library facilities which accommodated everybody. This increased participation in the commons in terms of spacing, and the newly established sections such as toy library and reading areas among others. It is evident from the study that the emergence of the commons in the libraries changed the manner in which these libraries used to operate and how they are operating currently.

8.7.3 Makerspaces

Findings revealed that most of the LOs indicated that their public libraries had Makerspaces called 'DIY' which were supported by the community members and governmental departments. This is an indication that Makerspaces are not new, but an important factor on how libraries in the emergence of new technologies are using and sharing their spaces with their community. Makerspaces in the libraries are changing better position to meet the expectations and needs of their diverse community members. Equally important, the cumulative of new technology is also changing the manner in which libraries are providing services, operate and comprehended in their society. This finding is in line with the study by Willingham and De Boer (2015) which indicated that Makerspaces are creating inventiveness, including progress of learning new innovations

because libraries are places known for acquiring knowledge, and building insight among other factors.

8.7.4 Library human resources implications

The results of the study revealed that most of the LOs indicated that they could not manage the commons due to insufficient human resource, while others emphasized that they managed from day to day. However, findings from the same study, contradicted what other respondents reported. Majority of the respondents provided an affirmative response indicating their effective involvement in the commons due to the fact that they had sufficient library human resources. This is an indication that library is still one of the places in the community where community members gather as citizens not as consumers. Therefore, rapid changes in the library environment expected library officials to render various services and that mostly threatens their performance. It is evident that the emergence of commons threatened their performance because of the new technologies and lack of human resources. The findings of this study support the study of Griffiths (1995) which indicated that modern librarians are expected to retrieve and provide information using digital and non-digital resources to meet the various information needs of the diverse community.

8.7.5 Commons interfere with your performance given your knowledge and training

The results of the study revealed that the commons did interfere with the performance of most of the library official's knowledge and training. New technologies challenged knowledge of library officials because they have to learn new skills in order to operate them effectively and also assist their users. Therefore, this will lead to the fact that public libraries have to organize more learning and development trainings to improve the library officials' level of performance in the commons.

8.7.6 Interconnection with related institutions and social practices in the commons

Majority of the LOs revealed that indeed their libraries have become a place of social interactions accessible to users, where children and adults made friends, socialized, shared information and library resources. Emphatically, this might be the rightful factor to the impact of new technologies

on community of commons in the library who accessed digital resources and interconnected with related institutions and social practices. This finding supports the study of Hess and Ostrom (2007) which confirmed how commons users' interconnections and interactions contribute to the failure and/or success of the commons. On the contrary, it was revealed by few of the respondents in other libraries that adults had problem of interconnecting and socializing with one another, while children connected with each other. This finding is in line with the study of American Library Association (1996-2020) which stated the importance of building and maintaining social connections in the libraries.

8.7.7 The spectrum of participants in the commons in the libraries

Majority of the LOs revealed that their libraries comprised with a wide spectrum of participants which included; Africans, Whites, youth, students, school children and people with disability. However, the elderly people including adults, Coloureds and the Foreign nationals were regarded less so. Therefore, it is evident that these nine selected Thabo Mofutsanyana District public libraries should consider involving all community members to avoid inequality and discrimination in the commons to avoid patterns of interaction. This finding of the study is in line with the study of (Hess & Ostrom 2007). Also, this finding corroborates with the study of Khoo, Rozaklis and Hall (2012) who argued that libraries should understand a wider spectrum of commons users and that can be accessed through library metrics and research instruments such as questionnaires and surveys or community analysis needs. This entails that libraries in nature are categorized and classified into various groups from the community. This is a clear indication that users are important components in the commons.

8.7.8 Growth of the commons since its inception

Findings showed that all LOs revealed that the commons were growing since their inception in their respective libraries. The results of the study correlate with the studies by (Vijayakumar & Vijayan 2011; Wenborn 2018) which indicated the rapid transformation of IT and its impact in the library services. This is an indication that the accessibility of new technologies will influence the development and future of the commons in the libraries. Therefore, the researcher is in the view

that commons in these public libraries are playing a significant role in terms of building a knowledgeable and informed community.

8.7.9 Normative foundations of library

Majority of the LOs reported that the commons had enlightened the normative foundations of their respective libraries and it had increased, as well as quality of service delivery was good. However, depletion of data within a short period of time was highlighted as a problem by one respondent who envisaged it is a threat that will keep the normative foundations of his library. This finding explains that services and human resources are the basic of the development of the commons in the libraries. Threats such as depletion of data, restricted Wi-Fi and lack digital resources in the commons will not illuminate the normative foundations of the libraries.

8.7.10 Library mission and the new development in the libraries

The results revealed that majority of the LOs indicated that there were points of conflicts between their understanding of the library mission and the new development in the libraries, while one respondent disagreed with it. This leads to respondents failing to commit to library goals. It is also difficult for commons users to adhere to rules and regulations if the library mission does not identify and commit to the new development in the library. This finding is in line with the studies of American Library Association (1996-2020); IFLA (2001); Nelson Mandela University (2019) which argued that library mission describes library's purposes and systems and who is supposed to be served by a particular library. Surprisingly, the results from the same study revealed an unexpected response from one respondent who was uncertain as to whether or not there were any points of conflict when it comes to the existing library mission and the new development in the libraries. This is an indication that library mission has to be revisited and redesigned in order to fit into the new library development. Consideration should also be given to creating awareness programmes that will guide library officials to achieve library goals.

8.8 Incentives for participating in the commons

8.8.1 Incentives to promote, encourage and facilitate participation in both using and making rules

Most (46.2%) of the commons users indicated that they were provided with incentives to encourage and facilitate their participation in both making rules to keep the commons functional. This implies that incentives need to be prioritized in order to encourage and facilitate participation. It is evident that if commons users are unaware of incentives, their existence, or trust may reduce participation and cooperation in the commons.

Furthermore, findings from the study also revealed that most of the LOs attested that they provided commons users with incentives in the form of free access to knowledge, skills and information via the books and free internet-connected computers, certificates, competitions, award prizes and refreshments to encourage participation in the commons. It was only few of the LOs who reported that they did not provide incentives as a way of promoting or encouraging participating in both using and making rules in the commons in the libraries. Therefore, libraries have to be educated about the impact of incentives in the commons because they can affect patterns of interaction and outcomes (Hess & Ostrom 2003, 2007; Ostrom 2005). This is an indication that libraries have to apply IAD framework in order to understand how to govern commons. This finding corroborates the studies of Hess and Ostrom (2003, 2007); Ostrom and Hess (2003); Ostrom (2005) when they study the commons.

8.8.2 Supply of resources to the library for public use

Findings showed that majority (50%) of the commons users indicated that they were at some point requested to participate in supplying resources to the library for public use in the commons. The finding resonates with the study of American Library Association (1996 -2020) which highlighted the fact that it is important for the library to set guidelines that will manage the resources supplied by the library users. Evidently, libraries are organized information and knowledge hubs which have limited key resources for all community members. Therefore, this is an indication that the emergence of new technologies has provided users an opportunity to supply if possible, the resources that can be accessed in the commons.

8.8.3 Donation of tangible or intangible resources to the library

More than half, (59.5%) of the commons users authenticated that if asked to do so, they would have donated tangible or intangible resources to the library. This is a positive reaction because it shows how users were willing to improve their commons in terms of resource development. This finding coincided with the studies by American Library Association (1996 -2020); Hess and Ostrom (2007); Kamasak (2017) who also investigated the contribution of tangible and intangible resources and their guidelines. However, most of the respondents reported that their donation to the library would have depended on the type of tangible and intangible resource. This is an important factor which will impact the libraries negatively or positively in the future, so it is better for libraries to address the importance of donation in their communities.

8.8.4 Teamwork among library users

Findings reveal that majority of CLs reported that there was teamwork among users who worked collaboratively with library officials, and few disagreed and stated that there was no teamwork in their respective libraries. The researcher hypothesized that this might be the reason why one respondent opted not to respond to this question. The idea of teamwork is valuable in the libraries because information, knowledge and resources can be shared easily among users without conflict. This is a good indication that commons is notable because it encourages various uses and promotes teamwork. Also, this is a positive reaction because most of the respondents respectively were children, students or learners and youth, and some of them complained about lack of adequate resources.

8.8.5 Knowledge and information sharing among library users

Next, findings revealed that majority of CLs indicated that there were sharing of knowledge and information practices among commons users in the commons. Sharing of knowledge and information is a good practice in the commons because users can use the same limited resources equally without quarrel and conflict. Therefore, it is important to have a clear understanding sharing practices of resources to meet the users' needs. This study correlates with the studies by

Davenport and Prusak (1998); Kumaresan (2010) which cited that knowledge management system is an important tool that needs to be implemented in the process of maintaining sharing of knowledge. On a contrary, study by Goodman and Darr (1999) cited in Kumaresan (2010) argued that practicing of sharing culture which results shared rewards is necessary before the knowledge management system can be implemented. It is an indication that part of the reason for underlining the significance of creating knowledge and information sharing in the commons has to do with the effectiveness of resource sharing among the commons users, and this correlates with the studies of (Hess & Ostrom 2007; Kranich 2004, 2008).

8.8.6 Compliance to library norms and regulations

Findings showed that most of the CLs stated that they complied with library norms and regulations in the commons. This indicated that obeying of library norms and regulations created by the library management, displayed a discipline among users. However, the contradiction was that the same number of the respondents reported that they did not adhere to the library norms and regulations. It is important from the beginning that libraries should inform and involve their commons users during the formulation of library rules so that compliance to library norms and regulations can be adhere to. This finding is in line with the studies of Hess and Ostrom (2007); Ostrom (2005) when they studied institutions and compliance to the existing rules which is important in preserving the commons to avoid the tragedy of the commons (Hardin 1968). This study is also in line with the studies of Cole (2007); Hess and Ostrom (2007); Ostrom (1999, 2005) which studied the rule-in-use in the commons.

8.8.7 Conflicts that arose in terms of resources sharing

The results of the study revealed that most of the CLs indicated that there were no conflicts that arose in terms of resource sharing and other cooperative activities, if there were, they were not serious and were quickly and easily resolved among commons users. This is an indication that public libraries function well through the support of satisfied commons users; hence resource sharing is one of the aspects supporting compliance to library norms and rules as well as user satisfaction in the commons. However, from the same findings, some of the respondents confirmed

that sharing of limited resources often cause conflict in the commons. This implies that libraries must implement strategies to promote sharing of resources to avoid conflict that arise in terms of resource sharing and other cooperative activities to many commons users. Therefore, this finding is in line with the study of Sinha and Satpathy (2008) which postulated that libraries must provide convenient access to information to all commons users to avoid conflict that arise in terms of resources sharing.

8.9 Patterns of interaction

8.9.1 Patterns of interaction among patrons of the commons

Considering patterns of interaction, findings revealed that most of the LOs observed the positive patterns of behaviour among patrons in the commons. It was further revealed that adults solved their problems, while children approached officials for assistance. Physical and material conditions in the commons can encourage and discourage a good behaviour among users during sharing of resources. However, the same results revealed that there were users who did not cooperate with others during sharing of resources especially adults. It is important for the libraries to have common resource management rules in place, and inform their users about the conditions of the resources and how their conduct can affect it. This factor will prevent users to make their own decisions to cooperate or not to cooperate to library norms, rules and regulations because that will affect the structure of the situation in the commons.

8.9.2 Difficulties or challenges experienced in the use of the library in view of the new changes

The study revealed challenges with the depletion of data to access internet before the end of the month, changing of Linux (free software) and restricted Wi-Fi access. These are disturbing trends because they prevented easy access or use of the new technologies, and which results to the failure of commons. It was revealed that some of these public libraries had unlimited GB, however, due to an increased number of users in view of new changes, the internet speed is slow. Therefore, it is important to have free Wi-Fi access to assist a flow use of new technologies. It was also revealed that time allocation to use digital resources was also a challenge that needs to be solved by the participating public libraries.

Enquiring about the challenges experienced in the use of library in view of the new changes, the study revealed challenges about the broken computers, air-conditioners, scanners, photocopiers, including inadequate computers to accommodate the increased number of commons users in the commons. Therefore, it is evident that these numerous challenges hindered full access to new technologies, library resources and services in the commons. The study revealed that some of these libraries were the only sectors in their communities where some digital and web related services were rendered, so it important for them to consider solving these factors.

South Africa is experiencing regular load shedding which is a method used to switch off power supply to costumers in order to reduce electricity consumption, and it affects library services. Therefore, the study revealed challenges based on the absence of Uninterruptible Power Supply (UPS) backup devices for load-shedding protection. These public libraries experienced challenges of load shedding because new technologies utilize electricity and it is a national challenge. Lack of access to the entrance of the facility during rain, and unavailability of water in most of the libraries were some of the challenges revealed by the study. Water is an essential service in all aspects of life. Therefore, it was difficult for library officials and commons users to drink and use water and also to access wastewater services in these libraries due to the absence of water. Evidently, it was discovered that absence of water was not only a library-based challenge, but it affected the entire community, so it was a municipal challenge. The study revealed challenges about the absence of life skills sessions for older people in the libraries. It was evident that some of these libraries were overlooking programmes that will help in developing senior citizens. Libraries will develop the life skills sessions for older people by conducting outreach programmes in the communities.

8.9.3 Benefits or advantages experienced in the use of the library in view of the new changes

Enquiring on benefits or advantages experienced in the use of the library in view of the new changes, majority of CLs acquired digital skills from different digital resources. This is not a surprise factor because the results revealed that majority of people who were visiting the libraries were youths who utilized digital technologies most of the time to access information. Again, the revealed advantages include: good interactions between users and library officials, assistance from

other users and teamwork which resulted to knowledge and information sharing of resources in the libraries. This initiative takes off some of the workload of the library officials because it obvious that libraries have users who do not have problem in terms of searching and accessing information for themselves. The finding of this study is similar to the same view shared by the studies of Soria, Franssen and Nackerud (2017); Vijayakumar & Vijayan (2011) which indicated the impact of the academic resources and application of IT in the libraries.

8.10 Outcomes

8.10.1 Aspects that libraries should do to make commons successful

(a) Increasing the amount and quality of scientific knowledge

Majority (55.1%) of the respondents reported an increased amount of quality of scientific knowledge making commons in the library successful. This is a good achievement because libraries by nature are assisting students, learners and researchers by providing access to the digital resources through open access. This conforms to the study of Hess and Ostrom (2007) which indicated that patterns of interaction also affect outcomes of commons governance negatively or positively. Public libraries should be aware of open access issues because they may affect the quality of scientific knowledge available in the commons because a high quality of scientific knowledge produces quality research which improves research practices through the use of technologies. Lastly, it was also revealed that old materials were discarded to maintain the quality of scientific knowledge in the commons.

(b) Equality in the commons

Most (48.7%) of the commons users reported that commons promoted equality in their respective libraries. Interestingly, this factor was also attested by majority CLs who confirmed that they have never encountered or practiced inequality in the commons in the libraries. This illustrates a positive reaction which indicates that public libraries practice equality in the commons regardless of demographic status. Equality is not a new phenomenon but it's a normative concept which requests that all users be treated the same in the commons in the libraries. The results corroborate with the study by Public Libraries News (2020) which reported an important aspect which highlighted the fact that inequality in public libraries deals with users who were desperately looking for books but

being denied the opportunity to access or have them, while the study of Spicker (2020) revealed factors that deals with inequalities. On the other hand, the study of Lowther (2017) regarded libraries as an inclusive space where all community members are expected to receive the same level of services regardless of their demographic backgrounds and status. The study suggests that since people are not equal in the intellectual and physical attributes, they should not be treated unfairly because this might jeopardize the success of the commons and the purpose of the libraries.

(c) Applying fair standards in the commons

Next, most (46.8%) of the commons users stated that fair standards were applied in the sense that all individuals were expected to benefit equally from their contributions to make commons successful. The results conform to the study of Hess and Ostrom (2007) when they were analysing equality in the commons. However, this is an indication that there is a gap in terms of applying fair standards in the sense that all individuals were expected to attest that the fair standards were applied in the commons because the highest response was under 50%. This finding is in line with the studies of ALA (2021); Hall (2017) which clearly indicated that libraries by nature are equally open to all community members regardless their demographic status and location. This implies that public libraries should consider the institutional aspects that will apply fair standards on the basis of equality among commons users who are contributing towards the benefit coming from the commons.

(d) Building standards in the commons

Enquiring about building standards that leads to high levels of participation in the commons, most (42.4%) of the commons users considered it great. This finding is in conformity with studies by ALA (2021); Hall (2017); Hess and Ostrom (2007) who regarded libraries as an inclusive space where all community members are expected to receive the same level of services. Again, the study revealed a small number of commons users who did not know about building standards that led to high levels of participation in the commons. This is a good indication that most users are aware of the relevant standards that public libraries need to maintain in order to sustain the success of the commons.

(e) Maintaining the sustainability and preservation of the commons

Findings showed that most (40.5%) of the commons users were maintaining the sustainability and preservation of the commons. The results of this study correlate the study of Hess and Ostrom (2007) which pointed out that sustainability system are current needs that maintain the commons. Also, the study revealed that in order to ensure sustainability in the commons, LOs reported the matter to the Free State Department: Sport, Arts, Culture and Recreation to deal with it accordingly. It was also revealed that the CWP workers and library officials maintained the cleanliness of the commons. Therefore, this is an indication that sustainability has to be a continuous process that requires regular re-evaluation and monitoring. The study suggests that the process and strategies of evaluating the sustainability and preservations should also consider the interactions among commons users whether they contribute to the success or failure of the capital in the commons.

(f) Ensuring the economic efficiency of the commons

Most (34.2%) of the commons users ensured the economic efficiency to make the commons successful in the libraries. The findings corroborate with the study of Hess and Ostrom (2007) which indicated that economic efficiency depends on the cost that are in line with the allocation of the resources in the commons. This implies that economic efficiency factor includes the acquisition of digital resources, maintenance of the physical infrastructures and open access publication fees which is a major concern in the public libraries because of the ongoing budget constraints. Therefore, the study suggests that in order for commons to be sustained for a long term, public libraries need be cost-effective and network with stakeholders who will finance the community.

8.10.2 Assessing level of participation in the commons in the library

Majority (81.6%) of the commons users assessed their level of participation in the commons in the library and indicated that it was fair. It is evident that level of participation was attached to various factors such as incentives, amount of information in the repository, resources, services and rules in the commons in the libraries. This implies that commons users understood the impact of commons and how they operated hence their level of participation was considered fair.

8.10.3 Opinions about the advantages of the commons

Enquiring about the opinions about the advantages of the commons, most (37.3%) of the commons users opined that they were sustained. These opinions indicated the reason why it was attested that maintaining the sustainability and preserving of the commons was one of the aspects that made commons successful. The study also revealed (30.4%) of the commons users believed that the commons increased the amount of high-quality scholarship in the libraries. Lastly, the same findings, showed that majority (50%) of the commons users affirmed that the commons promoted equality among users. This is an indication that public libraries have a better understanding and knowledge of how commons work better to sustain the resources in order to meet the diverse information needs of the users. Commons is considered to be a significant aspect in terms of sharing of information and knowledge as resources and accessing of new technologies.

8.11 Synthesis of the chapter

Chapter Eight provided an interpretation and discussions of the findings of this study as per the research objectives. The study demonstrated that knowledge commons ensure that the community access the new technologies, share information and knowledge, collaborate, and interact. It was also revealed that openness and freedom provide the community opportunities to utilize open access in the libraries which was a major attraction in the commons. Open access was indicated as a positive reinforcement which assist the commons users to meet their information needs. It was therefore indicated that the study revealed five keywords that mostly represented the responses from the findings; literacy, library, digital, skills including online. It was revealed in this chapter that the reason for visiting the commons was the fact that it had all the digital resources commons users need and attracted majority of young people. The chapter further revealed that the availability of digital resources assisted both commons users and library officials to acquire digital skills and creative competence which provided them with IT capabilities. Also, commons was indicated as a self-directed learning place where people make friends or get distracted by others, while the support from library officials was marvellous.

This chapter also revealed the inconsistency on the issue of biophysical materials in the commons. Even though, they constituted a major attraction in the commons, the chapter revealed that other commons users were not interested in the digital and online resources. They still prefer the traditional library services and materials over digital services. Furthermore, the chapter revealed that commons community comprises with a spectrum of people whom others did not play a significant role in supporting or providing resources to sustain the commons. However, Thabo Mofutsanyana District community still support their libraries through CPW work programme.

The chapter also indicated lack of awareness, involvement or participation in making library norms, rules, policies and regulations, and this hampered the management of commons in terms of compliance of rules. The study revealed that aspects of IAD framework enforce good governance in the commons. Therefore, this chapter revealed that libraries were partially not providing incentives to promote the use of commons, and or stimulate participation in the commons. It was also revealed that commons users were willing to donate tangible or intangible resources in the commons only if they were requested to do, if not, they were not willing.

It was revealed in this chapter that patterns of interactions in the commons did not affect the teamwork, sharing of information and knowledge, and compliance to library norms and regulations. However, it was revealed that there were no conflicts in terms of sharing resources in the commons. Both library officials and commons users indicated their challenges and benefits experienced in the commons in view of the new changes, and recommendations were also provided. In conclusion, outcomes emanating from the interactions in the commons were mostly positive.

CHAPTER NINE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

9.1 Introduction

Chapter Eight provided the interpretation and discussions of the findings of this study. In this chapter, a summary of the key findings and conceptual framework of the study are presented, followed by the conclusions which are guided by the research objectives based on data which was analysed in Chapter Six and Seven including integrative literature review in Chapter Four. Furthermore, this chapter makes recommendations and suggestions for future research.

9.2 Summary of key findings

The study examined the emergence of knowledge commons in nine Thabo Mofutsanyana District public libraries in South Africa. This section presents a summary of the key findings addressing the research questions.

9.2.1 Emergent knowledge commons events in the libraries in the Thabo Mofutsanyana District

The study revealed that most of the respondents relied on online resources for their personal and learning purposes. This was because they were young and technological savvy. This group of users were also positive about the idea of open access in the commons because it replaced the existing material which mostly was regarded as irrelevant and outdated. The study revealed that respondents were satisfied about the sufficient space in the commons which consists of the digital resources that assist them to achieve their information needs. Also, the supportive role of the library officials was one of the major social and materials emergent event in the commons. The study revealed that digital skills and creative competences were developed through the use of digital technologies, including the use of free and open software and resources, internet, and social media. This was because the level of interaction was positive and stimulated learning in the commons. The study also revealed that there were people who were disgusting in the commons, and those who believe that commons was a distraction to digital literacy, while others opined that

it was a distraction to normal library services. This is because there is a spectrum of users in the commons who have various information needs. Furthermore, the study revealed that library users made friends in the commons and used it as place to meet other people, spend quality time with them and learn. This is because libraries are regarded as social spaces.

9.2.2 Acquisition and performance improvements in the knowledge commons

The study revealed that there was a transformation in these public libraries that led to an improved biophysical condition such as technology infrastructure and physical spacing. Artefacts such as books and articles were always available but considered outdated. This is because majority of users were youth who preferred online resources over printed materials. From the study, it was evident that computers and tablets with free internet access were increased and available but not enough to accommodate the increased number of users who were attracted to new technologies. People were also considered as one of the items that attracted users to the commons. Considering the significance of Press Reader, ProLib and OPAC, it was evident from the study that they did not attract users in the commons because most of the time they were not working. This was because they were not easily accessible to commons users. Overdrive however, attracted users because it could be accessed at their convenient time.

It was also revealed that accessing of personal emails attracted majority of users. Personal emails assisted unemployed users to communicate with the corporate world to look for jobs. It was revealed that users accessed knowledge from electronic documents for learning and research purposes. The study revealed that there were computer classes conducted in these public libraries. This was because these public libraries were investing into developing digital literacy in the commons. The study also revealed that there was no library website except ProLib library system. The study further revealed that online gaming was not a popular item in the commons. This was because most of these public libraries do not have them in their possession. However, there were improvements in the libraries in terms of acquisitions of resources which led the improved performances of library officials.

9.2.3 The role of the community of users in the Thabo Mofutsanyana District in influencing public library resource use in the libraries

The study further revealed that the community of the Thabo Mofutsanyana District visited the commons to use the existing space; however, some were undecided to provide it with resources to make it rich. This practice can create problems in terms of sustaining the success of the knowledge commons. Again, the community attested that they did not assist or play any role in terms of maintaining the commons, except the assistance from the CPW workers. However, the study further revealed that the same community believed that if they can work together in supporting the commons, commons can be developed rapidly. This is because the initiatives from united community including stakeholders, can assist commons in terms of donating or supplying resources and bring financial stability. Considering the new library users, commons have developed a new library community which comprised by majority of children and youth including unemployed individuals. Also, the study revealed that there were still other members of the community who were utilizing the commons besides the mentioned community of users.

9.2.4 The nature and extent of the norms, rules, and laws in the Thabo Mofutsanyana District

Irrespective of the emerged new technologies and services in commons, the study revealed that users did not participate in the making of norms, rules and regulations that guided the use of it. This can create a problem of compliance of rules and regulation in the commons because users were not part of the decision making. It was further revealed that IRP issues were considered, and also problems that could result out of the IRP practices, the existence of the commons addressed them. However, legal issues arising from IPR and related matters, had never been encountered since the emergence of commons. Again, the study revealed that no new library policy was created or known, and if there was any, Free State Department: Sport, Art, Culture and Recreation was responsible for developing it. The community were not engaged at all.

Furthermore, the study revealed that new governance was imposed because of the emergence of the commons. There was a problem because the study also revealed that new governance was not imposed. In most cases, transformation affects the existing systems in any organization. Again,

the study revealed that users were aware of self-governance mechanisms practised in the commons. This is because users managed to reveal the existence of membership rules, resource contribution and extraction requirements, conflict resolution mechanism and monitoring rules, as well as sanctions for rule violation in commons. This is an indication of good governance in the commons. The significant recommendations were revealed in the study in terms of norms and rules that guided the use of present-day-library. This was a positive initiative because recommendations assist the decision makers to review their decisions on the success of the commons.

9.2.5 Support of the emergence of knowledge commons practices inside and outside the library

The study further revealed that commons transformed these public libraries into larger social spaces with added digital resources that can accommodate more diverse users than before. This means that the emergence of commons changed how these libraries used to operate in their communities. Also, it was revealed that these public libraries had Makerspaces called DIY. Makerspaces assist libraries to empower users in terms of socializing, learning, inventing, collaborating and sharing of ideas and resources. In these Makerspaces, the study revealed that resources were supplied by the community and governmental departments.

Human resources were implicated by the emergence of commons. The study revealed that most of the library officials could not manage the commons due to the lack of manpower. This is because the new technologies attracted more users who are demanding more services to meet their information needs. Again, it was revealed that the rapid transformation in the commons threatens the performance and knowledge of library officials. The study further revealed that there were points of conflicts in terms of understanding library mission and the new development. This means that the library mission has to be revisited and revised once there are transformations in place, especially where there is an advent of new technologies.

9.2.6 Library as an institution influence the behaviour of library actors and service consumers

Incentives encourage participation of library actors and service consumers in the commons; however, the study revealed that incentives were not provided in the commons. It was also revealed

by the study that the only incentives provided to library actors and service consumers were in the form of free internet access, competitions and handing of certificates, offering of refreshments to children, and award prizes. The absence of incentives in the commons will impact the patterns of interactions that will affect the structure of the commons and aspects that make commons successful.

9.2.7 Influence of the host community and library service providers on information use behaviour

Irrespective of the absence of some of the aspects that make commons successful, the study revealed that positive patterns of interaction were observed. This means that there was cooperation in terms of resource sharing, teamwork, compliance of norms, rules and regulations.

The challenges affecting the success of the commons were identified, and also benefits accumulated since the advent of the commons were revealed. However, the most revealed challenges were time allocated to access digital resources, services, library hours, lack of enough digital resources, slow internet speed and restricted Wi-Fi. New technologies in the commons developed digital literacy, provided space to access digital resources, printed materials and online services such as open access, free internet and social media among other benefits. Therefore, these aspects affect the users' and service providers patterns of behaviour which will determine the outcomes of the commons.

9.2.8 The contribution of emergence and acceptance of knowledge commons, and socio-ecological and other circumstances of the actors of the libraries in the Free State

The study revealed that an amount of quality of scientific knowledge increased in these public libraries. This was because the commons attracted more students and school learners who visited public libraries for their educational purposes. Despite the challenges experienced in the commons, it was also revealed that libraries play a significant role in terms of assisting and supporting the educational systems in their communities. With regards to equality issues, it was revealed that fair standards in the commons in the libraries promoted equality because they can

satisfy various needs of the diverse users. Again, this means that commons-built standards that compelled the service providers, library officials and users to treat each other the same regardless of the demographic status.

Sustainability is the most important factor in the commons, hence the study revealed that the commons were sustained and preserved. Again, it was also revealed that the Free State Department: Sport, Arts, Culture and Recreation ensured the sustainability of all the commons in the District. This means that the department also ensure the economic efficiency to make the commons successful in the libraries. Collaboration with the stakeholders in the community can also assist with the sustainability to maintain the success of the commons.

9.3 Conclusions

From the results, it can be concluded that the rapid transformation in these public libraries compelled them to change the manner in which they used to function. Most of the respondents were young and technological savvy, and used online resources for their day-to-day and academic responsibilities. Transformation in these public libraries brought improvement to biophysical conditions and enhanced library officials' performance. The community and stakeholders believed that if they could form a unison relationship, they can assist the commons substance in ways such as donations. In terms of in the making of norms, rules, policies and regulations, the users wanted to be involved in decision making. Free State Department: Sports, Art, Culture and Recreation were responsible for any new policies that were formed. Positively there were no legal issues regarding IRP matters. The commons are a social space that house a diverse group of users, because members of the community's needs met through the emergence of the spaces.

There was compliances of norms, rules and regulations amongst the users. Hence, there was team work in terms of resource sharing even though there were a few challenges that arose with the emergence of knowledge commons. Insufficiency of incentives may result in the failure of commons even though the officials believed that they provided incentives for participation and promotion of the commons by allowing the library users free services such as internet access. It could also be concluded that through the emergence of knowledge commons factors such as

equality, fair standards, sustainability and economic efficiency were emphasized and considered. Lastly, the quality of the scientific published knowledge was improved.

9.4 Recommendations

The recommendations were informed by the limitations that resulted from the findings of the study to develop and improve issues related to the knowledge commons in the public libraries in South Africa.

9.4.1 Open access and knowledge commons

Public libraries should address issues related to restricted access to the electronic knowledge published to increase open access in the commons. Public libraries should also create awareness and training of open access so that library officials and users can be in the position to understand IPR and copyright legal issues. To address the challenge of slow network, public libraries should upgrade their physical-network infrastructure including the copper-wire switches, routers, optical fibre, host computers, end-user workstations and also check with their service providers because their network or internet is slow. Subscription to uncapped internet is recommended so that public libraries never run out of GB in bandwidth during the month. It is therefore essential that the public libraries should install free Wi-Fi to ensure access to internet which will provide users access information and knowledge within and outside their physical library structures.

9.4.2 Biophysical conditions

Public libraries should increase the number of digital resources such as computers and tablets, and create library websites where they will be able to market their activities and services. It is recommended that libraries should also update their library collection in order to meet the information needs of library users. Public libraries should redesign their library spacing, and upgrade or renovate their facilities to accommodate the recent transformation that comes with new technologies.

9.4.3 The commons community of the library

It is recommended that public libraries should market their services and activities in their respective communities so that communities are aware of their significance and existence. It is therefore important that public libraries should know and assess who are the information users, service providers, and policymakers in the community. The community should also be capacitated in terms of knowing their roles in the libraries, and be given an opportunity to be part of rule and policy making in the libraries. It is recommended that community members should work together in supporting and donating or supplying the libraries with resources, maintain sustainability in the commons.

9.4.4 Participation in making rules and regulations for the commons

Public libraries should involve and allow users to participate in the making of rules and regulations for the commons. This will minimize non-compliance of rules and regulations in the commons. The community should be engaged in formulating library policies, rules and regulations in the commons to enforce compliance. There must be public participation meetings during the formulation of library bye-laws and policy reform.

9.4.5 Incentives for participating in the commons

Public libraries should understand aspects related to the incentives because they affect patterns of interaction and the outcomes in the commons. It is recommended that users should be informed about sharing of resources, compliance of rules and regulations and teamwork in the commons.

9.5 Suggestions for future research

The study highlighted a number of topics that can be further investigated. This study coincidentally revealed that some of the participated public libraries had Makerspaces. This factor has demonstrated the significance of considering the absence of Makerspaces in the public libraries. Therefore, future studies might look at the impact of Makerspaces in the public libraries in South

Africa. Furthermore, this study highlighted a number of additional studies based on the knowledge commons that can be undertaken. These included further studies on governing the knowledge commons in the public libraries and exploring patterns of interaction in the public libraries.

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APPENDIX: A PERMISSION TO STUDY BY THE EMPLOYER



10 November 2017

Department of Information Science
Master's and Doctoral Degree
UNISA
Pretoria
0003

Doctoral Degree in Information Science in 2018
Re: Molaodi Margaret Matobako (37247751)

Dear Sir/ Madam

Mrs Molaodi Margaret Matobako (Student Number – 37247751), and I discussed her decision and strong desire to take her dedication and skill to the next level. I have worked very closely with her during the several years that she has served as a Coordinator in my Library and Information Services Division (LIS). Mrs Matobako has excelled in this role, exhibiting one of the highest levels of productivity I have seen in a Coordinator during my 19 years tenure with the libraries.

She produces a high volume of work while consistently maintaining high standards for quality and accuracy. Her upbeat personality and engaging personal style enable her to interact effectively with library users and staff. She is very well organized and keeps track of the details necessary to coordinate library events and run an efficient library office. Proactive in anticipating rising administrative needs, she takes initiative to go beyond the expected parameters of her job. All the intangibles that lead to success in the workplace are in order with her.

I volunteered to write this recommendation for her because I am very grateful for her contributions to my libraries and very confident that she has the intelligence, academic discipline, work ethic, and communications skills to add value to her studies. I assure you that Mrs Matobako will complete the Doctoral Degree exceedingly well. She also possesses the ultimate "can do" attitude while taking on all tasks with a positive energy and a smile. I recommend her most highly and without reservation.

Please feel free to contact me as her Manager if you have any questions about her.

Sincerely,

NL Damane-Mnyanda
MANAGER: LIS
MANGAUNG METROPOLITAN MUNICIPALITY

PO Box 3704, Bloemfontein 9300 Adelaide Tambo Public Library, CNR Charles Street, Bloemfontein, 9300
Tel: +27 51 4058241 E-Mail: Mpumie.Damane@mangaung.co.za Website: www.mangaung.co.za

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APPENDIX B: PERMISSION TO CONDUCT A RESEARCH STUDY



sport, arts, culture & recreation

Department of
Sport, Arts, Culture and Recreation
FREE STATE PROVINCE

Ref:

Enq: N. D. Ramugondo

RESPONSE: PERMISSION TO CONDUCT A RESEARCH STUDY

Dear Mrs Matobako

Receipt is acknowledged of your correspondence and request to conduct research in some of the libraries in the Free State province.

Permission is thus granted for the research. We hope that the outcomes of your research will assist the Free State Library Services to improve its services to its communities.

Best wishes and good luck with your research project.

ND Ramugondo
Acting Director: Free State Library Services
Department of Sport, Arts, Culture and Recreation
29 January 2018

APPENDIX C: LETTER OF APPROVAL



sport, arts, culture & recreation
Department of
Sport, Arts, Culture and Recreation
FREE STATE PROVINCE

THABO MOFUTSANYANA DISTRICT LIBRARY SERVICES, CNR HIGH & VAN DE MERWE
STREET, BETHLEHEM 9700, TELL: 058 4920 421/13, CELL: 066 479 1085, Email:
nodikida@sacr.fs.gov.za

Enquiries: M. T. Nodikida

REF:

Molaodi Margaret Matobako
Bloemfontein
0605041346

Dear Mrs. Matobako

RE: DATA COLLECTION FOR A PHD THESIS PERMISSION IS GRANTED

This serves to grant permission for data collection for a PHD Thesis for Mrs. Molaodi Margaret Matobako according to her schedule submitted to the district office. The data would be collected in the following libraries according to her request, Bohlakong public library, Moemaneng public library, Leratswana public library, Fateng Tse Ntsho public library, Zamani public library, Petsana public library, LS Sefatsa public library, Mashaeng public library, Meqheleng public library and Intabazwe public library.

Thabo Mofutsanyana district library services office is wish Mrs. Matobako all the best in her endeavor.

Hoping that you'll find this in order.

Yours Sincerely,

Nodikida MT

Deputy Director: Thabo Mofutsanyana District
Library Services, Tel: 058 492 0413

Date: 07/03/2020

Sign: 

APPENDIX D: INFORMED CONSENT FORM



INFORMED CONSENT FORM

Title of the research

Emergence of Knowledge Commons in Thabo Mofutsanyana District Municipality Libraries, Free State, South Africa.

I, _____, confirm that Mrs Matobako asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

I have read (or had explained to me) and understood the study as explained in the information sheet.

I have had sufficient opportunity to ask questions and am prepared to participate in the study.

I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable).

I am aware that the findings of this study will be processed into a research report, journal publications and/or conference proceedings, but that my participation will be kept confidential unless otherwise specified.

I agree to the recording of the focus group semi-structured interview.

I have received a signed copy of the informed consent agreement.

Participant Name & Surname..... (please print)

Participant Signature..... Date.....

Researcher's Name & Surname..... (please print)

Researcher's signature..... Date.....



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APPENDIX E: QUESTIONNAIRE

Section A: Demographic Characteristics

Instruction: Please select the appropriate answer below by ticking (X) in the spaces provided:

1. Name of library: _____
2. Name of Municipality: _____
3. Which of the following captures your identity?
 - 3.1 Community leader []
 - 3.2 Head of an institution []
 - 3.3 Professional []
 - 3.4 Distinguished resident []
 - 3.5 Other []
 - 3.5.1 Please specify _____
4. What is your age?
 - 4.1 18-24 []
 - 4.2 25-34 []
 - 4.3 35-44 []
 - 4.4 45-54 []
 - 4.5 Above 54 []
5. How long have you been using this library? _____
6. What would best describe you?
 - 6.1 African []
 - 6.2 Asian []
 - 6.3 Coloured []
 - 6.4 White []
 - 6.5 Others []
 - 6.5.1 Please specify _____
7. Which gender do you identify with?
 - 7.1 Male []
 - 7.2 Female []

- 7.3 I would prefer not to comment []
8. What is your highest educational qualification?
- 8.1 Less than high school certificate []
- 8.2 High school certificate or equivalent certificate []
- 8.3 Tertiary certificate []
- 8.4 Diploma []
- 8.5 Degree []
- 8.6 Postgraduate degree []
- 8.7 No schooling []
9. How do you describe your marital status?
- 9.1 Single and have never been married/never lived together as husband/wife/partners []
- 9.2 Legally married (including traditional, religious, civil, etc.) []
- 9.3 Separated but still legally married []
- 9.4 Divorced []
- 9.5 Living together like husband and wife/partners []
- 9.6 Widowed []
- 9.7 Single, but have lived together with someone as husband/wife before []

Section B: On Open Access and Knowledge Commons

Below are opinions about recent developments in respect of access to knowledge published in the electronic environment. As much as you can, please supply us your opinions, perceptions and feelings with respect to the development.

10. Please rate your level of agreement about recent developments in respect of access to knowledge published in the electronic spaces with the following statement: (5=Strongly agree, 4=Agree, 3=Undecided, 2=Disagree, 1=Strongly disagree)

	5	4	3	2	1
10.1 Open access is freely available in commons					
10.2 Knowledge published is enclosed in the commons in the library					
10.3 Open access resources often apply copyright restrictions					
10.4 Knowledge increases and spreads best when there are no restrictions to access					
10.5 Open access has a greater research impact for students and or library users					
10.6 Education resources must be published with open licenses					
10.7 Open access resources supplement online library materials					
10.8 Access to electronic resources is clear in terms of intellectual property rights to no intellectual property rights in the commons					

11. Could you please discuss your opinions, perceptions and feelings with respect to the recent development in the commons in the library?

12. In your opinion, how do the social and material resources of the commons support diverse information and other engagement necessary to stimulate learning? Rate your level of agreement

by ticking (X) in the spaces provided: (5=Strongly agree, 4=Agree, 3=Undecided, 2=Disagree, 1=Strongly disagree)

	5	4	3	2	1
12.1 The space has all the digital resources I require					
12.2 I can meet people I learn from					
12.3 The level of interaction among users of the space is very useful to me					
12.4 I have the liberty to influence others positively					
12.5 I meet those that influence me positively					
12.6 I have met people that are disgusting to me in the space					
12.7 The supportive role of the commons staff is very helpful					
12.8 I have at one time or the other acquired some digital resources such as software from colleagues I met in the commons					
12.9 I have acquired some digital skills from some people I have met in the commons					

13. Do you envisage that digital literacy and creative skills are being achieved by participating in the commons in the library? Please select the appropriate answer below by ticking (X) in the spaces provided:

1. I envisage so
2. I do not envisage so
3. I can't say for now

14. Could you please explain the reason for your choice of response?

15. Based on your interactions with co-users of the commons, how do you think people's experiences in the commons are reshaping their interests in and identifications with digital

literacy? Rate your level of agreement by ticking (X) in the spaces provided: (5=Strongly agree, 4=Agree, 3=Undecided, 2=Disagree, 1=Strongly disagree)

	5	4	3	2	1
15.1 The commons is already fast-tracking digital literacy					
15.2 The commons may fast-track digital literacy in the future					
15.3 The commons is a distraction to digital literacy					
15.4 I am yet to address my mind to this kind of issue					

16. What kinds of digital literacy skills and creative competences do commons participants develop through their participation in the use of the space? Rate your level of agreement by ticking (X) in the spaces provided: (5=Strongly agree, 4=Agree, 3=Undecided, 2=Disagree, 1=Strongly disagree)

	5	4	3	2	1
16.1 Use of digital technologies					
16.2 Use of free and open access resources					
16.3 Use of FOSS (Free and open-source software)					
16.4 Use of social media					
16.5 Use of internet					
16.6 Other literacy, not necessarily digital					

17. What are the meanings and motivations users attach to their engagement in the commons? Rate your level of agreement by ticking (X) in the spaces provided: (5=Strongly agree, 4=Agree, 3=Undecided, 2=Disagree, 1=Strongly disagree)

	5	4	3	2	1
17.1 The commons is a place to make friends					
17.2 The commons is a place to meet people who may assist one solve learning and related problems					
17.3 The commons is a place to pass time					
17.4 The commons is a place to engage in self-directed learning					
17.5 The commons is a distraction to normal library services					

Section C: Biophysical Conditions

18. How does each of the following physical or observable items constitute a major attraction to you in the commons? Please answer all the questions and select the appropriate options below by ticking (X) in the spaces provided: (5=Very high, 4=High, 3=Undecided, 2=Not high, 1=Not very high)

	5	4	3	2	1
18.1 Articles					
18.2 Books					
18.3 Web pages					
18.4 Computers, tablets or online games					
18.5 People					
18.6 Other					
18.6.1 Please specify					

19. How does each of the following non-physical artefacts that make information available constitute a major attraction to you in the commons? Please answer all the questions and select the appropriate options below by ticking (X) in the spaces provided: (5=Very high, 4=High, 3=Undecided, 2=Not high, 1=Not very high)

	5	4	3	2	1
19.1 Internet					
19.2 Social media					
19.3 ProLib library system					
19.4 Online Public Access Catalog (OPAC) - stand-alone online bibliography of a library collection that is available to the public					
19.5 Overdrive (library e-books)					
19.6 Press Reader - digital newspaper and magazine					
19.7 Other					
19.7.1 Please specify					

20. How does each of the following content and related issues that make the commons a major attraction to you? (Please answer all the questions and select the appropriate options below by ticking (X) in the spaces provided: 5=Very high, 4=High, 3=Undecided, 2=Not high, 1=Not very high)

	5	4	3	2	1
20.1 Accessing the library websites/ library system (ProLib)					
20.2 Knowledge from electronic documents					
20.3 Education – computer classes					
20.4 Digital experience – online gaming					
20.5 Communication – accessing of personal emails					
20.6 Other					
20.6.1 Please specify					

Section D: The commons community of the library

21. Which of the following describes your roles in the commons? Please answer all the questions and select the appropriate options below by ticking (X) in the spaces provided: (3= Yes, 2= Undecided, 1= No)

	3	2	1
21.1 I come to the commons to use the resources already existing in the space			
21.2 I periodically provide resources required to make the commons rich			
21.3 I periodically provide policy ideas to the library regarding how to move the commons forward			

Section E: Participating in making rules and regulations for the commons

22. Have you ever been involved in any of the following rule making scenarios to keep the commons functional? Please answer all the questions and select the appropriate options below by ticking (X) in the spaces provided: (3= Yes, 2= Undecided, 1= No)

	3	2	1
22.1 Making rules for day-to-day operations of the commons			
22.2 One of the individuals that interact to decide the operational rules			
22.3 One of the groups that define who may participate in making collective choices			
22.4 Other			
22.4.1 Please specify			

23. Are you aware of any rules regarding each of the following? Please answer all the questions and select the appropriate options below by ticking (X) in the spaces provided:

(3=Yes, 2= Undecided, 1= No)

	3	2	1
Who may access the commons,			
Who should contribute to the commons,			
Who could extract or remove content from the commons,			
Who should manage the commons,			
Who could exclude others from accessing the commons,			
Who has the right to sell or lease content from the commons			

Section F: Incentives for participating in the commons

24. Does the library provide the commons users any incentives to encourage and facilitate their participation in both using and making rules to keep the commons functional? Please answer all the questions and select the appropriate options below by ticking (X) in the spaces provided:

1. Yes []
2. No []
3. Not that I know []

25. Has the library ever requested that you participate in supply of resources to the library for public use? Please answer all the questions and select the appropriate options below by ticking (X) in the spaces provided:

1. Yes []
2. No []
3. Not that I know []

26. Would you willing to donate tangible or intangible resources to the library if you are requested to do so? Please answer all the questions and select the appropriate options below by ticking (X) in the spaces provided:

- 1. Yes
- 2. No
- 3. It depends on the resource

Section G: Outcomes

27. To what extent would you consider the commons in your library to be successful in the aspects listed hereunder? Please answer all the questions and select the appropriate options below by ticking (X) in the spaces provided: (5=Great, 4=Somewhat, 3=Undecided, 2=Not great, 1=Not at all)

	5	4	3	2	1
Increasing the amount and quality of scientific knowledge;					
Maintaining the sustainability and preservation of the commons;					
Building standards that lead to high levels of participation in the commons;					
Ensuring the economic efficiency of the commons;					
Applying fair standards in the sense that all individuals benefit equally from their contributions;					
Working towards equality in the commons by redistributing resources to poorer individuals					

28. How would you access the level of participation in the commons in your library? Please answer all the questions and select the appropriate options below by ticking (X) in the spaces provided:

- 1. Fair
- 2. Unfair
- 3. I don't know

29. Which of the following statements captures your opinion about the commons in your library based on your experiences so far. Rate your level of agreement by ticking (X) in the spaces provided: (5=Strongly agree, 4=Agree, 3=Undecided, 2=Disagree, 1=Strongly disagree)

	5	4	3	2	1
29.1 The commons is sustainable					
29.2 The commons increase the amount of high-quality scholarship					
29.3 The commons promotes equality among users					

APPENDIX F: INTERVIEW FOR LIBRARY OFFICIALS

1. Could you please elaborate on your disposition (character) towards the open access philosophy (idea)?
2. Elaborate on any training you have had on open access in the past five years.
3. Could you please inform of any open access policies, statements or positions of this library?
4. Are there any open access resources built by the library? For instance, FOSS, Listserve, electronic manuals, etc. for the purpose of serving information to the community?
5. As much as possible, could you please describe the antecedents (background) of the commons in your library?
6. What are stories of the creation and operation of the commons in your library?
7. Can you describe the new library community in view of the event of the commons?
8. Describe the community which the commons serve – individual, markets, government, or the public?
9. What are the electronic and non-electronic resources you have in the commons?
10. Please describe the rules and regulations guiding the use of the space?
11. Are the users involved in making the rules?
12. Can you describe the makerspace that provides aspects of commons services in your library?
13. Who are the suppliers of these resources?
14. Do the commons impose any form of new governance system in the library?
15. What are the self-governance mechanisms: membership rules, resource contribution and extraction requirements, conflict resolution mechanisms, monitoring rules, sanctions for rule violation available in the library as a result of the commons?
16. Are there any administrative and other costs of involved in constructing, monitoring and enforcing compliance with the rules installed to guide the use of the commons?
17. Does the library provide any incentives to promote the use of the commons?
18. Have you encountered any legal issues regarding Intellectual Property rights, subsidies, contracts, antitrust provisions?
19. How does this encounter shape the operations of the commons?
20. What are the new library policies regarding managing the library in the event of the emergence of the commons?

21. Who are the policymakers, are the community members and users involved in making the policies?
22. What is the library human resources implications (involvement) of the creation of the commons, and how is the library responding to them?
23. What is the response and role of the community of users and policymakers in this new development?
24. Do you consider the commons as an appropriate response to the development of open access model of knowledge access?
25. Describe the open access environment in your library
26. Based on your observation as a library officer, what are the interactions you have observed among users of the commons?
27. How is the community of commons in your library accessible to and interconnected with related institutions and social practices?
28. To what extent do you think issues about Intellectual Property rights have been taken into full consideration in the emerging library model?
29. Can you describe the spectrum of participants in the commons in the libraries?
30. Does the library offer any form of incentives to stimulate participation in open access?
31. Do the commons address problems arise out of Intellectual Property rights?
32. Do you consider that the commons in your library is growing since its inception (establishment)?
33. Do you envisage (foresee) that the commons will illuminate (brighten) the normative foundations of library?
34. Are there points of conflicts between your understanding of the library mission and the new development in the libraries?
35. Regarding access and use of the commons in your library, have you ever encountered any issues associated inequality such as race, age, gender, etc?
36. What are the patterns of interaction among patrons of the commons? Is there any observed way they solve underlying collective problems when they arise?
37. How does the commons interfere with your performance given your knowledge and training?

38. What are the benefits of the commons, in terms of resources and who benefits? For instance, to what extent does the commons facilitate the production of high-quality intellectual resources, promote equality within the commons, and ensure its sustainability?

APPENDIX H: INTERVIEW FOR COMMUNITY LEADERS

1. How do you describe the prevailing (current) openness (open access) in the libraries in respect of provision and access to materials in the operations of your public library?
2. Can you describe your level of awareness about open access and associated developments and how they play out in this library?
3. In your own opinions, what systems/strategies do you think should be installed or implemented to support and promote open access in this library?
4. To what extent do you think this library in your community has conformed (adapted) to this global transformation?
5. Describe your observations, feelings, experiences and opinions about artefacts that exist in your library. Focus on physical nameable representation of ideas such as:
 - (i) Articles, (ii) books, (iii) internet resources such as web access, (iv) ICTs such as computers lab, tablets, free internet access, multimedia space (v) others, such as toy library materials (*please feel free to specify*).
6. Describe your observations about facilities that store the artefacts and make them available such as (i) new forms of library spaces (ii) computer network infrastructure in the library.
7. From your experience as a user of this library, could you please describe how the recent transformation in the library appears to have enabled the library meet the information needs of users better than before?
8. Do you have any examples to buttress (support) your description?
9. In your own opinions, are the transformations going on in the libraries altogether very beneficial or do you think that there are aspects that negate (exclude) your expected roles of the library?
10. Give some examples.
11. As one knowledgeable about the existence and activities of the library in this community, what assistance and role has the community provided, or played in the sustenance and maintenance of the library?
12. How much of these roles do you think the community can play together in view of the rapid transformations we have discussed?
13. Teamwork among library users to create, or supply resources to the library to meet people's information need?

14. Knowledge and information sharing among library users to mutually meet information needs of the library users?
15. Compliance (submission) to library norms and regulations?
16. Conflicts that arise in terms of resource sharing and other cooperative activities among library users?
17. Could you please share your observations about how the practice norms, rules and laws that control management of library services have been influenced?
18. Have you observed any self-governance mechanisms in the library such as relate to:
(i) membership rules? (ii) resource contribution and extraction requirements? (iii) conflict resolution mechanisms? (iv) monitoring library use and sanctions for rule violation?
19. What, if anything, would you change about norms, rules and laws if you could?
20. Can you describe any particularly difficulties or challenges experiences in your use of the library in view of the new changes?
21. Can you describe any particularly benefits or advantages experienced in your use of the library in view of the new changes?
22. What would you recommend in respect of norms and rules that guide the use of the present-day library?