The Academic Library in Society's Knowledge System: A Case Study of Tshwane University of Technology

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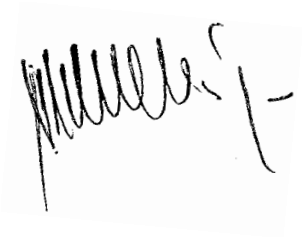
Declaration

I declare that this dissertation submitted for the degree Master of Information Science at the University of Pretoria, is my own original work and has not been submitted by me for a degree at another university.



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Abstract

Academic libraries traditionally support universities in their teaching, learning, and research activities. Their support roles can be broadly defined in terms of the organization and storage of knowledge, as well as its distribution and access. This makes them important role players in South Africa's broader library and information services ecosystem. As a result, academic libraries do not operate in a vacuum. As part of the broader society the targeting of academic libraries during student protest action represents a unique type of social conflict. This unique type of social conflict is not fully understood and this study investigated Tshwane University of Technology's libraries using the idea of a knowledge system as a theoretical framework.

The main argument of the study is that academic libraries have a historical relationship with research libraries, and have an important connection with society's knowledge system. The oversight of the functions of academic libraries problematizes their role and response to social conflict. The study used a focused literature review and documentary evidence, and data was collected from a purposive sample using an electronic survey questionnaire, focus groups and interviews.

The study found that TUT's libraries passive response to the 2015 and 2016 student disruptions stems from a poor understanding of the theoretical context of their support roles and functions. The main value of the study is to call attention to the idea of a knowledge system and to enable TUT's libraries to respond adequately to social conflict.

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List of Abbreviations and Acronyms

AC	Academic Capitalism
ANC	African National Congress
BCM	Black Consciousness Movement
BRICS	Brazil Russia India China South Africa
CSRC	Central Student Representative Council
CPUT	Cape Peninsula University of Technology
CORC	Cooperative Online Resource Cataloguing
CHELSA	Committee of Higher Education Libraries of South Africa
DDC	Dewey Decimal Classification System
DAM	Digital Asset Management
DUT	Durban University of Technology
EFF	Economic Freedom Fighters
ERCs	Electronic Resource Centres
ERM	Electronic Resource Management
EU	European Union
FASIT	Fully Automatic Syntactically Based Indexing of Text
FETs	Further Education and Training Colleges
GATT	General Agreement on Tariffs and Trade
GEM	General Education Module
GUI	Graphical User Interface
HELIG	Higher Education Library Interest Group
ICL	Income Contingency Loan
ICTs	Information and Communication Technologies
IFLA	International Federation of Library Associations
IP	Internet Protocol
INSEAD	Institut European d'Administration des Affaires
IR	Institutional Repository
IS	Information Science
ISSN	International Standard Serial Number

LIASA	Library and Information Association of South Africa
LIS	Library and Information Services
LIS	Library and Information Science
NAFTA	North American Free Trade Agreement
NEHAWU	National Education Health and Allied Workers Union
NIS	National Innovation System
NUTESU	National Union of Tertiary Employees of South Africa
NTEU	National Tertiary Education Union
OAI	Open Archives Initiative
OAI-PMH	Open Archives Initiative-Protocol for Metadata Harvesting
OKS	Organisational Knowledge Systems
OPAC	Online Public Access Catalogue
PASMA	Pan Africanist Movement of Azania
PNS	Post Normal Science
RAU	Rand Afrikaanse Universiteit
RFID	Radio Frequency Identification
SANLAM	Suid Afrikaanse Nasionale Lewens Assuransie Maatkappij
SANLiC	South African National Library and Information Consortium
SAUS	South African Union of Students
SYM	Socialist Youth Movement
SPSS	Statistical Package for the Social Sciences
SRC	Student Representative Council
TLT	Teaching and Learning with Technology
TOK	Tree of Knowledge Systems
TUTDor	Tshwane University of Technology Digital Open Repository
TUT	Tshwane University of Technology
UA	University of Arizona
UB	University of Botswana
UKZN	University of KwaZulu-Natal
UN	United Nations
UNESCO	United Nations Educational Scientific and Cultural Organisation

UNISA	University of South Africa
UNMDG	United Nations Millennium Development Goals
URAP	University Ranking by Academic Performance
US	United States
WISIS	World Summit on the Information Society
Wits	University of the Witwatersrand
Wos	Web of Science
WWW	World Wide Web

Chapter One: Introduction and Overview

Introduction

The years 2015 and 2016 were a period of social upheaval and conflict led by various social movements in South Africa. The most notable development was the emergence of the hashtag student social movements at universities across the country. According to Koketso Poho, staff reporter of the University of the Witwatersrand's (Wits) *Vuvuzela*:

> The call for free decolonized education is generally understood by the vast majority of our society. The movement has been more of a campaign than a struggle. It has had an agenda of lobbying society than starting a serious battle. This battle seeks to challenge the government which has decided to commodify education and therefore limit access. The government is an extension of white capitalism and racism in South Africa. Therefore, this is a battle to change the racist status quo and infrastructure of apartheid which has remained untouched and unchanged by the ANC government (Poho, 2016).

Closer inspection of the quotation reveals perspectives shared by student leaders that are highly politicized and not properly thought through. They tend to reduce social conflict to issues of racism and capitalism while excluding alternative perspectives.

The student social movements that emerged in 2015 and 2016 and took social media by storm were the #Feesmustfall and #Rhodesmustfall. Although complex in formation and difficult to pin to a particular political ideology, these student social movements disrupted the higher education sector. During the disruptions, academic libraries were never part of the discourse even though they were also targeted by students. This study argues that academic libraries traditionally support university faculties and departments in research, teaching and learning through the materials organised and stored as recorded knowledge. In addition, they have a historical connection with research libraries and a link with the wider functions relevant in a knowledge system. This problematizes their position and responsibility as well as their response to social conflict.

While much of the student community's anger was directed at the government for allegedly failing to come up with policies that would, provide for "free quality decolonized education", it raised the societal problem of university-library-community relations as well. The opportunistic Marxist-Leninist undertones in the quotation by Poho and shortcomings in similar arguments by others is perhaps expressed more effectively in Dahrendorf's view (1958: 171) on social conflicts:

> The problem of conflict is no less complex than that of integration of societies. We now know that the attempt to reduce all actually occurring conflicts among social groups to a common principle, say that of classes, is sterile. It leads either to empty generalizations (such as "Every society experiences social conflicts") or to empirically unjustifiable oversimplifications (such as "The history of all societies so far has been a history of class struggles"). It seems advisable, first, to sort out and to classify the problems which are conceived under the general heading of "social conflict". Even a superficial reflection leads to the distinction of a series of types.

It is therefore relevant that academic libraries were also targeted in these protests which presents a particular type of social conflict and problem that requires fuller investigation. For instance, the destruction by fire of the library of the Ahmed Baba Institute of Islamic Advanced Studies and Research in Timbuktu in 2013 raised concerns among the International Federation of Library Associations (IFLA) and the South African National Library Association (LIASA). The burning of the University of Kwazulu-Natal (UKZN) Howard College Law Library was part of the discussions within the Library and Information Association of South Africa (LIASA) in 2016. Furthermore, Lor (2013), Dick (2013), and Ntsala and Mahlatji (2016) have investigated the phenomenon of the destruction of libraries, manuscripts and books during protest action. According to Dick (2013: 105), there has been a lot of collaboration between the government and LIASA in analysing the root causes of destruction of libraries during protest action. No charges were ever laid against those arrested and therefore the behaviour for such actions remains unknown.

As institutions for the communication of knowledge, particular types of social conflict for libraries in general, and for academic libraries in particular, can be better explained by locating libraries within the wider context of the knowledge system.

1.1 Problem statement:

Where do academic libraries fit into the narrative of “free quality decolonized education”? The South African higher education system is under tremendous pressure to accommodate larger numbers of students wishing to enrol at universities and Further Education and Training Colleges (FETs) for a variety of qualifications. At the same time, recent disruptions led by student activist movements are indicative of a bigger challenge facing South African institutions of higher learning than just the issue of fees. As a result, a debate has been sparked on the decolonization of higher education.

Academic libraries have for a very long time existed solely for the purpose of supporting university faculties and departments with their vast collections of recorded knowledge. Through their association with universities and colleges, academic libraries are part of a broader societal knowledge system, and influenced by other role players in their traditional core areas of focus namely organisation and storage, as exemplified in models of society’s knowledge system (Dick, 1982). Views on “free quality decolonized education” assert that universities may transform in order to be more inclusive and accessible in a democratic society, and that the university curriculum may be restructured to include indigenous knowledge systems. These views connect society’s knowledge system and academic libraries which organise, store and disseminate knowledge. In South Africa, the functions of academic libraries were influenced by the country’s segregation policies of apartheid and the policies of higher education.

Yet in South Africa, research on the position of the academic library within such a theoretical framework and how traditional core functions of organisation and storage of knowledge relate to others such as knowledge production, distribution, application and use, have not received much scholarly analysis. Not much has been researched on how the segregation and apartheid policies impacted the traditional functions of academic libraries in general, and in a wider knowledge system as a particular type of social conflict, in particular.

1.2 Aim

The aim of this study is to fill the scholarly gap in this regard by focusing on Tshwane University of Technology's (TUT) libraries' challenges as a case study, in light of developments in higher education in South Africa and elsewhere in the world.

1.3 Research objectives

- To examine the context and functions of TUT's libraries using relevant literature and empirical evidence
- Compare TUT's libraries with a selection of South African universities and their libraries,
- Evaluate a set of relevant models of society's knowledge system and propose a suitable model.
- Expand and refine the model of society's knowledge system by creating a proposed model.
- Make recommendations on policy direction for TUT's libraries.

1.4 Main research question

Which model of society's knowledge system is best suited as a context to frame TUT's libraries' responses to social conflict affecting higher education in South Africa?

1.4.1 Sub-questions:

- What is the particular type of social conflict that problematizes the role of academic libraries?
- How did TUT's libraries respond to the student disruptions of 2015 and 2016?
- Why are TUT's libraries not taking part in activities related to knowledge production, application and use?
- Which is the most suitable model of society's knowledge system for TUT's libraries?
- What lessons can be learned from locating TUT's libraries within society's knowledge system more generally?

1.5 Methodology

The study employs a mixed method approach that draws on both literature and empirical evidence to build a case study of TUT's libraries located within a wider knowledge system context. Several data collection instruments are triangulated to collect data from more than one source. See Chapter Five for more details on methodology.

1.6 Significance of the study

- The study comes at a time when public discourse around the narratives of "free quality decolonized education", "decolonization of the university curricula", and "africanization of the university" of the 19th century is being revisited, with the insistence of students; by government, academics and the like.
- As the issue around higher education in South Africa is re-invigorated, there is a need to highlight relations between the university, the academic library and the general public.

1.7 Limitations of the study

- Although the concept of society's knowledge system and its processes has implications for all types of libraries, the study is limited to the university and its library.
- The limited time available for completion of the dissertation was considered. It is felt that the library within a university environment represents an institutionalised centre of technical, specialised knowledge that is used in academic professions.
- The nature and/or origins of the knowledge organised and stored by the library in its support of the teaching, learning and research activities of the university fits into the narrative of "free quality decolonized education" and therefore deserves attention.

1.8 List of key terms

The definitions of key terms were taken from authoritative sources. Each key term has various definitions by different authors in the literature. Those used were relevant to the aim of the study hence their selection. No other definition of the key terms in this study shall be considered.

1.8.1 Africanization within "the context of decolonization and political independence in higher education is to rid the writing (knowledge) of African history of the prejudices and limitations imposed by traditional colonial and European history" (Brizuela-Garcia, 2006:85-87).

1.8.2 Decolonization within the context of higher education means "the process of dismantling epistemologies and knowledge systems rooted in colonial, apartheid and Western worldviews and epistemological traditions" (Heleta, 2016).

1.8.3 Epistemology is "how we know…we make implicit epistemic statements about knowledge of concepts, acts, entities and systems…in so doing we create knowledge, and our epistemic stances dictate what kind of knowledge that is. Examples of names of epistemic stances include pragmatism, positivistic, operationalist, referential, instrumental, empiricist, rationalist, realist etc. each of these stances make claims as to what kind of knowledge can be created through research and how it is gathered and how it is presented. These epistemic stances do this work because they have a systemic view on reality, our knowledge of it, and the meaning we can ascribe to it" (Tennis, 2008:103).

1.8.4 Epistemic communities refers to "a network of professionals with recognised expertise and authoritative claims to policy relevant knowledge in a particular issue area. Such professionals can have different backgrounds and can be located in different countries, but they share a set of norms that motivate their common action, a set of beliefs about central problems in their area of expertise, they share criteria for evaluating knowledge, and a common policy enterprise. The concept of epistemic communities was first introduced by John Ruggie and then refined by Peter M. Haas" (Clunan, 2017).

1.8.5 Knowledge society is "a human structured organisation based on contemporary developed knowledge and representing new quality of life support systems" (Afgan and Carvalho, 2010).

1.8.6 Knowledge system is "a broader social context that can facilitate the sociological study of librarianship" (Dick, 1982). However, scholars of indigenous knowledge systems have sought to differentiate between knowledge systems in the world. For instance, their differentiation between knowledge systems of the global north and the global south have resulted in what is now known as indigenous knowledge systems. According to Lillejord and

Mashile (2004, v), “indigenous knowledge systems consist of indigenous, traditional and local knowledge that is contextual or situated knowledge”. Depending on one’s angle, indigenous knowledge systems can be defined using location or an association with a particular ethnic group. In this study, the term indigenous knowledge systems is an extension of the knowledge system referred to as African indigenous, local, traditional knowledge associated with all the ethnic groups found in South Africa.

1.9 Outline of chapters

1.9.1 Chapter one: Introduction and Overview

This chapter introduces the 2015 and 2016 student disruptions as a unique type of conflict for academic libraries. The institutional support role of academic libraries to universities, their historical connection with research libraries as well as the link of their relevant functions with society’s knowledge system is problematic, since this hampers their response to social conflict.

1.9.2 Chapter two: Mapping South African Universities and their Libraries

This chapter briefly compares TUT’s libraries as a case study with a selection of South African universities to understand the hidden history of their libraries. Selected universities are University of South Africa (UNISA), University of the Witwatersrand (Wits), Cape Peninsula University of Technology (CPUT) and Durban University of Technology (DUT).

1.9.3 Chapter three: Student disruptions crisis for TUT’s libraries

This chapter sketches TUT’s libraries passive response to the student disruptions of 2015 and 2016. The intention is to show that the passive response stems from a poor understanding of the theoretical context of their support roles and functions

1.9.4 Chapter four: Academic Libraries and Knowledge Systems

This chapter expands on the main argument provided in Chapter One. It addresses the historical connection academic libraries have with research libraries, looking at national variations of early development in American, British, Australian and German university library

environments. It also looks at the existence of knowledge systems across various disciplines, and the knowledge society approach. A set of models of society's knowledge system are evaluated.

1.9.5 Chapter five: Research Methodology

Chapter four briefly discusses the strategy used to investigate the topic. A blended methods approach is used to collect data from different sources. The case study method, a focused literature review and the qualitative evaluation method are used. In addition, an electronic survey questionnaire, a focus group and an interview schedule are used to collect additional data from a purposive sample of participants at TUT.

1.9.6 Chapter six: Data Analysis

This chapter analyses data collected from documentary evidence at TUT, the literature review and the purposive sample of participants. Both qualitative and quantitative data are analysed using the computer program Statistical Package for the Social Sciences (SPSS).

1.9.7 Chapter seven: Proposed Model for TUT's Libraries

After evaluating a set of models in Chapter Four, this chapter proposes a model for TUT's libraries. The model is adapted from the model of society's knowledge system and consists of elements of models evaluated in Chapter Four.

1.9.8 Chapter eight: Findings and Conclusion

The findings of the study are presented and a conclusion is given. The study concludes with recommendations that could assist in shaping TUT's libraries' policies henceforth.

1.10 Summary

In this chapter, an argument for the investigation of the topic was provided for in the introduction and problem statement. Several research questions were asked and research objectives stated. These were followed by the rationale, significance as well limitations of the study. An outline of chapters and list of key terms was also given.

Chapter Two: Mapping South African Universities and their Libraries

Introduction

This chapter deals with the development of TUT's libraries since the merger of former Technikon Northern Gauteng, Technikon North West, and Technikon Pretoria. An overview of selected South African universities and their libraries is also addressed for comparative reasons. Selected universities and their libraries include University of South Africa (UNISA), University of the Witwatersrand (Wits), Cape Peninsula University of Technology (CPUT) and Durban University of Technology (DUT). CPUT and DUT's libraries are included because the library system which is used by these libraries is similar to the one used in TUT's libraries.

Very few sources exist on library history in South Africa. This point is reiterated by Dick (2006) as well as Suttie (2005; 2006).

A very limited number of sources were found on academic library history in South Africa. Limited scholarly publications which were found include a study by Musiker (1982) on the aspects of Wits library history, a doctoral thesis on the history of the University of Natal libraries between 1910 and 2003 by Buchanan (2008), a book on the historical development of the library of the University of Cape Town between 1892 and 1955 by Immelmann (1955) as well as Dubow's (2006) article on South Africa's intellectual history. Also found was an unpublished dissertation on the some libraries and book collections at the Cape of Good Hope, with special reference to the establishment of the South African library by Tyrell-Glynn (1972) and Coates's (2014) doctoral thesis on the South African Library as a state aided national library in the era of apartheid. These publications are not on academic libraries but are helpful in highlighting the wider context for understanding the roles of libraries in society. Two publications by Suttie (2005; 2006) were very helpful in uncovering relevant facts about the UNISA library in Pretoria and its various branches. As a result, the search for sources on South African Universities and their libraries in this chapter was dominated more by a retrieval of annual reports of selected universities and their libraries through their websites and less relevant journal articles and books. Also, a few sources exist on public library history as in the case of Lor (1996); Owens (2002); Van der Walt (2004); and Brown and others in Suttie (2006).

2.1 Tshwane University of Technology (TUT)

The university was established on 1 January 2004, with the merging of the former Technikon Northern Gauteng, Technikon North West, and Technikon Pretoria. The merger resulted in the dropping of the word "Technikon" in favour of the internationally accepted "university of technology" designation. The university has campuses in four of the nine provinces namely Gauteng, Mpumalanga, Limpopo, and the North West province (TUT website, 2004-2018).

Through teaching and learning activities, TUT offers academic courses through its seven faculties on all four campuses. Around 50 000 students enroll annually, with 22 percent of students accommodated in its residences, thereby making it one of the largest residential higher institutions in southern Africa. Its Community Engagement Unit is responsible for liaison with public and private institutions on collaborations, partnerships, capacity building, skills development and refurbishing of resources (TUT website, 2004-2018).

2.2. The development of TUT's libraries

Each one of the campuses listed above has a library referred to as a "departmental library". The development of TUT's libraries can be traced back to the construction of the main library of the former Technikon Pretoria at the Pretoria campus. Although very little information could be found on the history of the former Pretoria Technikon library, its planning started in 1988. Planning and excavation work for the library started in 1992 after consultation between architects, engineers, building consultants, staff and library users. Importantly, the Pretoria Technikon library opened its door to users for the first time on the 01 October 1993. A year later, Mr Robin Plumbridge, Chairman and Chief Executive Officer of Gold Fields, officially opened the library on 17 October 1994 (TUT website, 2004-2018). As the reader will uncover in sections 2.3.2, private organizations have been involved in funding the establishment of university libraries throughout South Africa's history. It is therefore not surprising that the former Technikon Pretoria's library building at the Pretoria Campus was also referred to as Gold Fields given the financial contribution made by its sponsor Goldfields. "Gold Fields Limited is a globally diversified gold producer with seven operating mines in Australia, Ghana, Peru and South Africa, and a total attributable annual gold-equivalent

production of approximately 2.2 million ounces" (Gold Fields, 2018). The involvement of First National Bank in the development of TUT's libraries is also worth noting. For example, the bank contributed to the establishment of Electronic Resource Centres in TUT's libraries (see Figure 2.1). Another example of a local academic library-private organization relationship is that of the UNISA library and Suid Afrikaanse Nasionale Lewens Assuransie Maatkappij (SANLAM) (see 2.3). It is also a well-documented fact that international multi-national corporations such as the Carnegie Corporation contributed to South Africa's library and information services industry (Rochester, 1999). Partnerships between TUT's libraries and private organizations strengthens the argument that libraries can be located within the wider context of the knowledge system.

Figure 2. 1: The involvement of First National Bank in TUT's libraries.

After the merger of former Technikon Northern Gauteng, Technikon North West, and Technikon Pretoria in 2004, TUT's libraries inherited the library building of Technikon Pretoria's library in Pretoria and its collections. These collections have since been distributed to other 'departmental libraries' at TUT's satellite campuses. To date, collections of the former Technikon Pretoria can be found in TUT satellite campus libraries (refer to Figure 2).

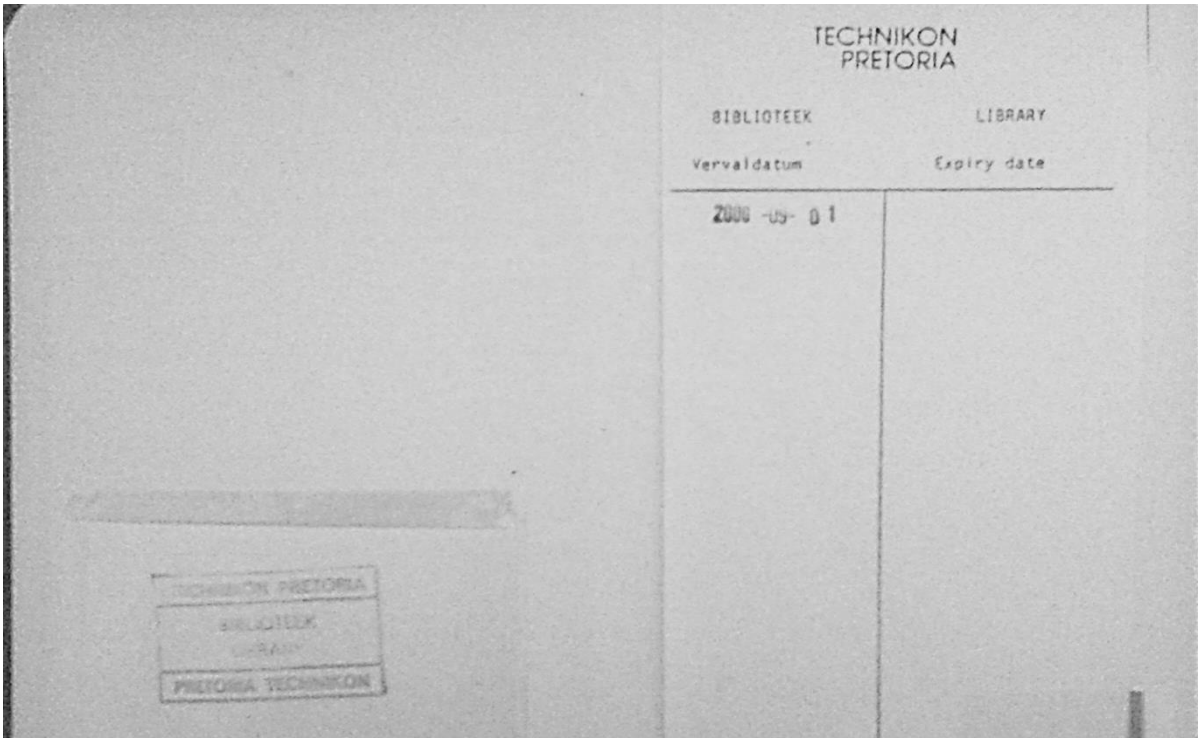


Figure 2. 2: The inside view of a circulation record of a book at the TUT Mbombela library.

According to the Library and Information Services policy, a departmental library is "a collection of information resources such as books, journals, videos, audio cassettes, and CD-ROMS that are collected, organized and stored by a department of TUT other than the Library and Information Services, to make it available to students and staff of a department for reference or study purpose". These departmental libraries exist to serve the needs of academic departments which offer specific courses in their different localities under the control of the Department of Library and Information Services which is centralized in Pretoria.

a. TUT satellite campus libraries

"TUT was established on 01 January 2004, following the government's move to merge Pretoria Technikon, located near the city centre, with the then Soshanguwe-based Technikon Northern Gauteng and Technikon North-West in Ga Rankuwa. This was a merger of historically disadvantaged institutions and a white university that the apartheid government had heavily invested into" (Nkosi, 2015). After the merger, TUT expanded by opening satellite campuses. By 2015, TUT had a total of six campuses. These campuses are spread

across four provinces namely Gauteng, Mpumalanga, Limpopo, and the North West province.

In 2018, TUT's satellite campuses consist of twelve learning sites with a 'departmental library' that supports the teaching, learning and research activities of various faculties and departments. Since the establishment of these learning sites and their libraries, the greatest challenge has been the distribution of infrastructure such as buildings and resources. For instance, between 2004 and 2015, there were numerous complaints by the student representative council (SRC) and political formations in satellite campuses such as Soshanguwe, Polokwane, Mbombela and Emalahleni about the unequal distribution of infrastructure and resources. SRC officer Noluthando Precious Mazibuko highlighted the lack lecture halls at the Soshanguwe campus and the absence of a library at the Polokwane campus. There were also complaints about TUT management's prioritisation of the Pretoria campus even after the merger. These complaints have since been looked into by the management of the university. In 2018, each of the learning site has been allocated a 'departmental library' with electronic resource centres and I-centres. According to the Institutional Feedback Report published on the 26 July 2017, electronic resource centres within libraries and outside libraries were rolled out to ensure students have access to computers, internet and WiFi hotspots. 300 computers were replaced in 2014, followed by a further 179 in 2015 in electronic resource centres and i-centres. These improvements created more technology enabled tools and resources for learners across most learning sites. The availability of technology enabled tools and resources enhance teaching and learning. These tools and resources also allow learners to search TUT's libraries digital collections as a supplement to printed collections. The extension of library facilities has been successfully carried out in some learning sites with the exception of the Mbombela Campus library (Council on Higher Education, 2017: 25-27). The recently launched Tshwane University of Technology Digital Open Repository (TUTDor) hosts the research output of faculties, departments and units of the university (TUT website, 2004-2018).

b. The visibility of TUT's libraries annual reports

Swanepoel and Smit (2003) conducted a study to ascertain the role that annual reports play in South African libraries in general, and academic libraries, in particular. In the previous sections it has been highlighted that most of the universities selected for this chapter compile and publish annual reports. These reports are easily accessible to anyone. According to Swanepoel and Smit (2003: 144), the majority of university and Technikon libraries regard past performance to be the main reason for compiling and publishing annual reports. Issues such as marketing and influence are perceived as "softer" and therefore regarded as not deserving of attention by some libraries, while only a minority of libraries regard future plans, strategies, and direction as purposeful. Only a few see the annual report as a document used to present financial statements. The researcher sought to find such annual reports for TUT's libraries, but none were found. This raises questions around the visibility of these libraries and their engagement with the public.

Although the availability of annual reports of TUT's libraries in the public space could be helpful in addressing governance issues such as transparency and accountability, they provide little information about the historical development of TUT's libraries. More authoritative sources such as books and journal articles are needed to examine TUT's libraries history.

2.2.1 Adapting to change and managing change

There is no denying the fact that change in society also affects academic libraries. This point was corroborated by Tucker (2000) in the following statement:

> Change is the air for academic libraries. Factors driving change are numerous and deeply interwoven and they influence virtually all of literate society, not merely academic libraries.

Indeed, adapting to the rapid changes taking place in society and managing the change is a daunting task for academic libraries. These are discussed in the next sections.

2.2.2 The advent of the World Wide Web

It is generally acknowledged that the advent of the World Wide Web (www) advanced the transition of character-based telnet systems to rapidly selling Graphical User Interface

systems (GUI). Pace (2009) reveals how the transition impacted on the first generation web-based online catalogues as libraries adopted a wait-and-see approach to the more sophisticated patron interfaces of the 21st century. This wait-and-see approach became a distraction as rapid changes to the nature of their mostly print collections and workflow took root. Web-based content licensed resources, born digital documents and institutionally significant digital collections emerged rapidly to overtake the effort required to maintain print collections, especially in academic libraries.

Traditional integrated systems designed to try and manage these new assets such as Cooperative Online Resource Cataloguing (CORC), e-reserve scanning stations, MARC 21 format, just to mention a few, proved inadequate. The challenge was worsened by the desire among software vendors operating outside the library to develop new solutions with new technology. Solutions such as Electronic Resource Management (ERM), Digital Asset Management (DAM) and Institutional Repository (IR) systems emerged to aid new library workflows (Pace, 2009: 642). Web 2.0 applications on the www are a useful way of engaging with the public for most modern organisations. Social media platforms such as YouTube, Facebook and Twitter just to mention a few, are powerful communication tools but they are not utilized within TUT's libraries.

2.2.3 Library management, research and administration

The impact of electronic technology on society influences library users to assume unpredictable behaviour. This forces library management to reconsider approaches in strategy, especially with regards to strategy and direction, leadership of personnel, collection development and management. Admittedly, in recalling the words of one university dean, Tucker (2000) posited that the activity of research in library administration has become more complicated as a result of rapid changes taking place in society and libraries. A change in libraries and library user behaviour has implications for institutional culture to which most academic libraries in universities are subjected. Budd (1998: 57) proposed organisational culture as a means to understanding the diversity of human organisations. That such constructs allow for an investigation into "the un-deterministic, non-mechanistic features and activities of an organization". It is through a deeper understanding of the diverse culture of

the organisation (i.e. universities) that both staff and management will be able to anticipate the changing needs of its users and develop a collection accordingly. TUT's libraries still use old library rules despite the fact that modern technological tools such as WiFi hotspots have been introduced into libraries. Most TUT's libraries' rules are displayed on the inner walls of the libraries. Most millennials spend most of their time in the libraries connected to their phones and personal computers and seldom pay attention to library rules. No research has been conducted on the changing behaviour of TUT's library users.

2.2.4 Collection development and management

The greatest impact on the function of collection development in South African academic libraries stems from the major changes that were brought by the re-alignment of higher education when laws are passed by government. For instance in South Africa, the Technikons Act of 1993 required South African Technikons to offer degree courses in addition to National Diplomas and National Higher Diplomas and this created an expectation for increased research output (Van Zijl *et al,* 2006: 159). The new focus put a strain on academic libraries as they were forced to reconsider their collections. Van Zijl *et al* (2006) further indicates that the situation worsened with the transition from Technikons to universities of technology in 2004.

Adding to the challenge was the new funding formula for private higher education institutions. The new framework was first published in the Government Gazette (Vol 462, number 25824) and was used for grant allocation in the 2004/5 funding period (Ministry of Education, 2004) (RSA, 2004). In terms of the categories of funding, 12% is for research output generated by Masters and Doctorate students. This simply means that academic library collections had to cater for the needs of post-graduates and researchers. However, Van Zijl *et al* (2006) highlights that little progress has been made by South African university of technology libraries in terms of expanding both print and electronic collections.

Collection development and the management of academic libraries relies heavily on what Coughlin and Gertzog (1997: 47) refer to as the "Campus Context". The authors further emphasize the importance of a clearly stated purpose. They describe colleges as including

faculty, administration, trustees, students, alumni, history, traditions, physical plant and a library noting that no two colleges combine these in equal proportions. The authors agree that all the elements are important in determining institutional character and as a result, that of the library. To understand institutional character is to understand the special place of the library within the campus setting.

TUT's libraries have inherited most of their collections from the former Technikon Northern Gauteng, Technikon North West, and Technikon Pretoria. Most of these former institutions were established during apartheid and their collections were greatly influenced by the political and economic climate of the time. The criteria used for the selection and acquisition of information resources in the TUT LIS policy on collection development are not aligned with TUT's policy on Language of Teaching, Instruction and Communication. For instance, section 3.4 on the LIS policy for collection development does not mention the development of SiSwati and Setswana as indigenous languages whose terminology it will develop for academic, scientific and communication purposes (TUT LIS Policy on Collection Development, 2018). This presents TUT's libraries with a challenge surrounding the nature of the knowledge organised, stored and disseminated to both students and staff. The collection development and management challenge is directly linked to the discussions in Chapter Three. Chapter discusses TUT's responses to the 2015 and 2016 student disruptions. The discussion will show how issues of collection development and management all connect with the wider context of the knowledge system.

2.2.5 Ordering, acquisition and circulation

It is argued that long before ATM machines and the World Wide Web, libraries in general were the first to introduce public computer use and database interaction (Pace, 2009: 642). This came about as result of the transition from manual punched card catalogues to early library integrated systems that relied on data supplied from a centralized hub connected to a main frame computer which assisted in the ordering, acquisition and circulation of physical materials mostly in print format. TUT's libraries currently use a modern library management system that allows for seamless ordering, acquisition and circulation of items from various publishers.

The LIS policy on the acquisition of information resources is informed by the LIS policy on collection development (see 2.2.4). Section 3.8 of the policy does not clarify the nature of the supplier of information resources. It only mentions time and costs as important factors (TUT LIS Policy on the Acquisition of Information Resources, 2018). Also, these two policies inform the policy on the circulation/loan of information resources. There is not much to read into the policy on the circulation of information resources except for the rules that pertain to staff, students, alumni and external members (TUT LIS Policy on the Circulation of Information Resources, 2018). TUT's libraries rely on publishers and commercial vendors to perform their ordering, acquisition and circulation functions. Publishers and commercial vendors form part of a network of entities and sub-entities which make up society's knowledge systems. The challenge for TUT's libraries is that the production of the materials ordered and acquired is left to publishers and commercial vendors. This challenge is not isolated, and connects with collection development and management - highlighted in section 2.2.6.

2.2.6 Organisation and storage of scholarly communication

In a discussion on scholarly communication, Budd (1998: 84) defined scholarly communication as "a system based on the assumption that the components of scholarly communication neither have independent origins nor behave independently". One of the primary components includes the faculty's interest in producing scholarly material and the outlets needed to disseminate the output. However, the availability of scholarly communication systems within the university does not answer questions asked by Steele (2014) as to who owns scholarly knowledge in the twenty first century? Is the future to be research-driven or publisher-driven and what role will universities and their libraries play in new scholarly communication frameworks?

2.2.6.1 Publishers and intellectual property rights

Mason (2017) reveals the tradition of academics and universities "selling off their intellectual rights so that publishers can make more money from their ideas and scholars can receive professional exposure" can be traced back to the history of scholarly communication in Ancient Greece in the third century BC. Students of Plato are said to have regularly sold or

rented out their master's intellectual transcripts. Anthenian publishers used scribes to make copies of intellectual work, which were sold through reading to a paying audience. These publishers made money while the scholars of the original work were paid nothing (Mason, 2017).

In addition, Steele (2014: 1-2) refers to the history of scholarly communication in Australia which dates back to the publication of the first peer reviewed publication *Philosophical Transactions* in 1665. The editor of the publication is said to have been paid very little, an unfair tradition, which Steele (2014) confirms, continues today for peer reviewed journal editors. The questioning of current trends in scholarly communication where big multi-national publishing companies dominate the publishing rights of knowledge produced by scholars in universities is very relevant to this study. For instance, this raises issues around the availability and role of university presses in managing the intellectual rights of producers of scholarly output, especially serials. According to Mason (2017), serials are at the centre of the crisis as a result of "the preoccupation with scholarly production and the tension existing between research and teaching…".

In corroborating the questions raised earlier by Steele (2014), Mason (2017) states that current trends in scholarly communication and challenges facing libraries and librarians with regards to collection development and acquisition amid rising volumes of serials publication, requires urgent attention. These current trends are discussed in detail in the publication, *Academic research, Scholarly Publishing, and the Serials Crisis* by Moya K. Mason.

2.2.6.2 The involvement of the academic library in scholarly communication

Budd (1998) observed the disjuncture between the qualitative and quantitative in the involvement of the academic library in scholarly communication as follows:

> The academic library is perceived as a qualitative part of the same system although the economic environment for the publication and pricing of serials for example is in most cases not determined by the management of the library but publishers outside the physical boundaries of the university itself.

The observation by Budd (1998) can be applied to the TUT's libraries context. Although TUT's libraries administer the university's institutional repository, the pricing of the serials is determined by publishers outside the university. Steele (2014: 3) advocates for disruptions in the now complex ecology of scholarly communication in order to rebuild a greener and fairer scholarly publishing environment.

There are currently very few universities in South Africa with in house university presses. These include UNISA, Wits as well as UKZN. The discussion in this section has been dominated by contestations around intellectual property rights, the serials crisis and the economic spin offs of scholarly communication. Not much has been said about the early influences of publishing and how these influences helped to shape universities and academic culture in South Africa. A painstaking search for scholarly sources on the origins of scholarly publishing led to the doctoral thesis of Elizabeth le Roux. Her study investigated the social history of university presses in apartheid South Africa. Although rooted in publishing studies, the study proved to be useful in providing answers to the following questions. What role can university presses play in shaping knowledge systems of modern contemporary societies? What were the early influences of universities and academic culture in South Africa? The TUT Intellectual Property Policy (2005) does not adequately address the questions above or those asked by Steele (2014). The next sections discuss university presses and their impact on the academic culture of universities.

2.2.6.1 University presses

The establishment of the first university printing press can be traced back to the nineteenth century. Prior to that, printing had already been introduced in the Cape of Good Hope mainly by missionaries and trade merchants. There were a number of events which gave way to university printing presses. First, the formation of the Union of South Africa in 1920 influenced the union to support Britain in World War I. During the war, Oxford University Press was the first to open an office in order to distribute books that were imported from colonial Britain. This point links with the history of the UNISA library discussed in Chapter Two.

The rise of Afrikaner nationalism between 1910 and 1960 saw the introduction of Afrikaans publishing houses, notably, Van Schaik and Nationale Pers. After the Anglo-Boer War, Afrikaans publishing houses flourished for two reasons, they had the full support of the National Party government after it rose to power in 1948 because of their support for the use of the Afrikaans language, and it was during this period that the National Party maintained its grip on power through the implementation of segregation policies which cemented apartheid rule. Examples of such policies included the University Act of 1955, the Extension of University Education Act of 1959 and the Bantu Education Act of 1953. After World War II, the publishing trajectory shifted from Anglo-Saxophonic to Afrikanerdom. Such a shift also influenced South Africa's universities (Le Roux, 2013: 6).

Since then, there has been a political transition from apartheid to a democratic state after Nelson Mandela was inaugurated as the first black African president in 1994. The 2015 and 2016 student disruptions took place twenty two years after the first democratic elections were held. Although so much has been achieved by the African National Congress (ANC) led government, universities and their libraries still have a long way to go in terms of transformation. Signs of early colonial influences within the university and the library are still very evident. Le Roux (2013) indicates that, "the academic culture at the local universities was thus initially colored by colonial ties with England and by scholars who had studies in the imperial metropole".

Elizabeth Le Roux's thesis proves very useful in our understanding of how publishing influenced the academic culture in South African universities and the role played by university presses throughout the colonial British and apartheid eras. It can also assist in understanding what role they ought to play in democratic South Africa, especially with regard to scholarly communication. Through the title of her thesis "Between Complicity and Resistance", we are able to understand the tough operational climate university presses found themselves in during apartheid. Conditions during apartheid did not allow university presses to exercise academic freedom and perhaps this also explains why only a few universities currently have university presses.

This then provides us with an opportunity to think critically about the knowledge system of contemporary South Africa. For instance, is the "Oxford model" of colonial British still in place or has it ceased to exist? Since publishing is an important component of the knowledge system, the thesis provides some perspective into challenges around the production of the learning and teaching materials which end up in the university library. Library management and the practices of TUT's libraries were inherited from former the technikons (i.e. Northern Gauteng, Technikon North West, and Technikon Pretoria) established during apartheid. Therefore, Elizabeth Le Roux's thesis is useful as it illuminates further the current challenges of TUT's libraries which this study seeks to investigate.

2.2.7 Academic integrity system

Drinan and Gallant (2008) assert that their interest in librarians and libraries as guardians of intellectual property and copyright in American institutions of higher learning was sparked by three reasons. Firstly, technological advances which have made it easier to plagiarise works and to detect plagiarism. Secondly, the growing interest in intellectual property has sensitized higher education to the matter of plagiarism. Thirdly, the formation of the Centre for Academic Integrity produced momentum for the adoption of best practices for the prevention and regulation of student academic misconduct, including plagiarism.

Traditionally, library rules include the creation of awareness on issues of copyright, intellectual property and respect for individual authorship. As Drinan and Gallant (2008) observe, the role of the librarian in enforcing academic integrity systems on students for instance, has for a long time been overshadowed by the responsibility bestowed on faculty staff. Given the impact technological advances have on academic libraries, the argument by the authors is not without foundation since technological equipment housed in the library could be used by library users to commit unethical acts including plagiarism. Allowing librarians to serve as guardians of academic integrity systems in institutions of higher learning could be a step in the right direction towards creating awareness across society as a whole. It is not clear what is expected from librarians within TUT's libraries with regard to the academic integrity system. Unless otherwise stated, the important issue of academic integrity does not feature on the job profiles of librarians at TUT.

2.2.8 Classification systems

Most academic libraries in South Africa and elsewhere in the world use the Dewey Decimal Classification (DDC) system as a classification system for knowledge organisation and storage. However, this long standing tradition has been challenged in the work of Hjórland (2008) and others. Questions are being asked around the eternity of the marriage that the DDC has enjoyed with academic libraries for centuries. The DDC is being scrutinized for weaknesses as corroborated in the following statement by Adler (2016):

> In recent decades, scholars and practitioners have tried to make sense of offensive, outdated, one sided terms, and their relationships by examining subjects and systems through an ontogenetic or historical lens, frequently, such studies analyze subjects using queer and critical race theories from indigenous perspectives. They reveal library classifications to be reflective of the times and spaces in which they are created, revised, and amended as well as perspectives and interests of the writers of the classifications, whether they are agencies of the State, like the Library of Congress, or social reformers who held particular views about "progress:", such as Melville Dewey.

Similarly, the continued use of the DDC within TUT's libraries cannot be left unchallenged. The classification system was used in the former technikon (i.e. Northern Gauteng, Technikon North West, and Technikon Pretoria) libraries established during the apartheid era. The same classification system is currently used.

Research done in other fields, for example computational linguistics has in recent times put pressure on approaches and methods used for document modelling in digital libraries to adapt to or face criticism for being too closed. Examples of such research include, among others, the study by Mehler and Waltinger (2009), who introduced a search engine-based classifier for the DDC which integrates social semantic knowledge to enhance document representation thereby proposing a move from a closed topic model towards a more open topic model for classification of documents in an online environment, that is, in digital libraries. The challenge for TUT's libraries is to do self-reflection on the over-use of the DDC as this directly impacts on the role they ought to play in ensuring the semantic and modelling participation of local languages in the systems they use to organise and store knowledge.

2.2.9 Teaching and learning

Teaching and learning are important cornerstones of functionality in higher education. Traditionally, teaching and learning at universities was supported by printed collections in academic libraries. However, the development of information technologies has changed how libraries support teaching and learning. Remotely accessible sources and devices have become digital extensions of traditional library buildings, collections and services (Gruca, 2010: 16). These trends and developments have culminated into a phenomenon known as E-learning. According to Gruca (2010), E-learning is a modern form of distance education based on using digital devices.

A study by Gruca (2010) highlights how E-learning offers new opportunities for university libraries and their users in Poland. In Botswana, the academic library at University of Botswana (UB) supports E-learning in the domains of distance learning, digitization efforts, digital institutional repositories through the INNOVATIVE system, e book service, e reserves, learning commons, multimedia resources, electronic reference services and integrated information literacy. Information literacy teaching and learning is also an integral part of the support offered by academic libraries to universities.

In this study, the definition of information literacy is taken from Johnson and Weber (2003: 336), who define information literacy as the adoption of appropriate information behaviour to obtain through whatever channel or medium, information well fitted to information needs, together with critical awareness of the importance of wise and ethical use of information in society. In fact, most universities have since included information literacy as an introductory module offered to undergraduate students. Among others, South African examples include the Durban University of Technology's General Education Module (GEM) as a renewal strategy to enhance student centred learning across all six faculties of the university (Neerputh, 2016) and the TUT101 module recently introduced at Tshwane University of Technology in 2016. Yet there are still challenges. The methods used to teach information literacy may need to be reviewed to suit the millennial user. Low turnout rates of students in information literacy classes, inappropriate behaviour towards library rules (see also 2.2.7), as

well as lack of evaluation tools to determine the effectiveness of the teaching methods on the students, remain obstacles.

The activities of the academic library highlighted in previous sections have all been affected by change. This literature review shows academic libraries in other parts of the world have become aware of the change and are adapting accordingly. Signs of adaptation to change are evident in the literature. In South Africa, policies on similar academic library activities at TUT remain the same in spite the transition from apartheid to a democratic dispensation. For instance, the LIS policy on Information Literacy Training does not address the language bias of the DDC discussed in 2.2.8. Much of the focus is on explaining the functionality of the DDC to students (TUT LIS Policy on Information Literacy Training, 2018). As the call for the transformation of universities among student formations grows, it is crucial to highlight the c TUT's libraries passive response to change may contribute to the emergence of conflict.

2.3 University of South Africa (UNISA)

The scarcity of scholarly sources on university library history in South Africa makes it difficult to investigate their link with the wider social context and other role players in society. This is made worse by the close institutional relationship that academic libraries have with universities. According to Suttie (2006: 284), the "institutionality" of libraries can be summed by making a case as follows:

> The "institutionality" of libraries discloses their plurality and diversity and often explains their contradictoriness, serving different constituencies and interests, accommodating conflicting and competing ideologies, apparently serving many masters. Researching libraries from the vantage point of social and cultural history is therefore likely to uncover such embeddedness of ideology and consciousness in library management and practice, not to mention its potential to identify intellectual and political currents.

Similarly, a sociological study of academic libraries can assist with a deeper systematic understanding of the contradictions, interests as well as conflicting and competing ideologies. A wider context of knowledge systems can offer a social vantage point that can be useful to understand the nature of academic libraries and their activities.

The formative years of the UNISA library were influenced largely by the growing number of African students who could not be accommodated at the South African Native College. Such a demand for education was a prelude to research and fierce debates regarding the introduction of distance education, which subsequently gave birth to services such as library loans. The library loans service was modelled on the University of London's external study system. Most books were acquired through donations from Australasian, American and European agencies and South African sources as funding was a problem during the early years. However, this improved with time as the state and other interest groups initially perceived UNISA as a "whites only university". The introduction of the distance education model and its successes during its early formation assisted UNISA in attracting funding from both the state and private funders such as SANLAM, which meant an exponential growth in the resources of its library (Suttie, 2006).

2.3.1 Connection with the British system of higher education

A closer look at the paragraph above reveals UNISA and its library had a closer connection with the British system of higher education during its formative years. It was through the research exported from London to one of the British colonies, South Africa, that the distance education model was introduced. Another point is that the distance education model allowed a mixed group of students to enrol at the university in spite of the constraining political and intellectual climate of the 1940s. Growing numbers in enrolment and a number of other factors, attracted both state and private funding to the university and its libraries. It is also not surprising that the UNISA library has a historical relationship with research libraries and their focus on knowledge production and other processes of modern contemporary knowledge systems. Both the introduction of the Research Library, sponsored by Afrikaner big business in SANLAM, the development of publishing enterprises in the area of librarianship such as Mousaion and others are indicative of the early involvement of the library in more than just one or two processes of the society's knowledge system.

2.3.2 The relationship between UNISA, the state and private organizations

Furthermore, we can sum up the relationship between UNISA, the state and private organisations as liberal since there were both signs of complicity and resistance during the formative years. Both the declining of the proposal by the Broederbond to change the university's name to Rand Afrikaans Universiteit (RAU) and the continued enrolment of students of African descent despite the financial support UNISA and its library were receiving from state, are indicative of this. The diversity of students served by the university included political prisoners, trade unionists and activists. It is now public knowledge that well known figures such as Dennis Goldberg and fellow Rivonia Trialist Nelson Mandela also received degrees through UNISA, with the library playing the role of intermediary and facilitator to their learning process. Suttie (2005: 102-103) indicated that little was documented on the Sharpeville police shooting of 1960 in UNISA library meetings of that year. The alleged insensitivity towards significant political events emboldens the liberal character of UNISA's library. Such a liberal character showed itself sixteen years later. According to Suttie (2006: 286) UNISA's library meetings between during the 1976 uprising was marred by a sense of "work as usual".

2.4 University of the Witwatersrand (Wits)

There has been a vacuum of debates on library history in South Africa since 1990 (Dick, 2006). This vacuum was also highlighted by former Director of Library Services at RAU, Piet Aucamp. In reference to the publication, *Wits Library: a centenary history* by Rueben Musiker and Naomi Musiker, he revealed how the history of the Wits library had not been adequately told until 1998. This assertion confirms the scarcity of relevant sources on academic libraries as highlighted in the introduction to this chapter. With this in mind, the following sections take a look at university-library-community relations, drawing on the 1998 narration by Aucamp, aspects of Musiker's (1982) work, as well as the 2014 Wits library annual report.

There are numerous signs of community engagement available on the Wits website. The Historical Papers Research Archive webpage on the university website points to a number of finding aids for the historical papers collection, the Anglican Church collections, the Historical Papers Photos, Poster Inventory, and a Guide to digital Audio-Visual resources. Also

established in 1966, the archive is situated in the William Cullen Library and is said to have been an accessible hub for human rights research, serving civil society, scholars and researchers.

According to Mohale (2017), the archives are the most revered in South Africa since they ”are extensive and provide a unique documentary record of South African history and society…and have contributed to many notable publications, television, documentaries, school textbooks and academic works…and contain collective social memory”. Mohale’s (2017) statement reinforces the notion that the organisation storage, and maintenance of the collection as well as making the collection accessible to the community, is the focus of the university library. Traces of knowledge production in the area of Library and Information Science (LIS) by library staff were limited if not visible at all. It was reported that only one library staff publication was produced in the 2014 Annual Report, while nothing was reported as published by library staff in the 2015 Annual Report.

At a structural level, the library has a decentralized structure inherited from the university’s early years. University committees such as the Board of Control of the Library are made up of Council and Senate members, and the Senate Library Committee has a say in the affairs of the library administration (Aucamp, 1988). Aucamp (1998) further indicates the domination of Council and Senate members in the operation of the library has its advantages but also led to the resignation of one university librarian. Over the span of seventy years only five university librarians had been appointed. The stubbornness of library management to stick to only five university librarians over seventy years could be attributed to the segregated past of librarianship in South Africa as highlighted by Suttie (2005; 2006) and Dick (2006). Library funding was derived from alumni, the campus population and the private sector (Aucamp, 1998). Unlike the UNISA library, Aucamp (1988) makes no mention of state funding during the early years of the library and this gives the impression of the dominance of private sponsorship in the erection of library buildings and the acquisition of books. Similar to other universities, current university-library relations at Wits are dominated by the teaching and learning as well as the research support the library provides to faculties and departments located within the university through its variety of services.

The growing cancellation of serials' subscriptions between the year 2010 and 2014 highlights some of the measures taken to deal with budgetary issues. This was done in consultation with university faculties and departmental representatives (Wits Library Annual Report, 2014). According to Aucamp (1988), there was library science education and training during the early years of the Wits library. However, the current academic topography of the university does not include education and training in the fields of library and information sciences.

Several activities of library cooperation and partnership, referred to as community engagement, are listed in the library's annual report of 2014. Interestingly, most of the activities of cooperation and partnership touted as community engagement within the ten branches of the library revolved around affiliation to professional bodies such as the Library and Information Association of South Africa (LIASA) (Wits Annual Library Report, 2014). From this it can be concluded that community relations within the Wits libraries is targeted mostly at academic and affiliated professional bodies and not necessarily the general public. The annual report of 2015 does not mention student activism that started in 2015 and destabilised higher education in 2016. The silence by the Wits library fraternity is not dissimilar to that of the UNISA library during the Sharpeville police shooting of 1960 and the Soweto Student Uprising of 1976, as indicated in Suttie (2005; 2006), and may be a cause for concern. It is important to note that the annual report of the Wits library does not provide enough information about the history of the library. The information provided might be a one sided view of the library's operational improvements for a specific year. For instance, these improvements could have been specifically selected to drive a particular subjective message meant for the management of the university and might not be reliable.

2.5 Cape Peninsula University of Technology (CPUT)

The Cape Peninsula University of Technology (CPUT) Library was started in 2005 as a result of the merger between the Cape Technikon Library and the Peninsula Technikon Library. In the introduction to the Annual Report of 2015, Chairperson of Council, Mr M Bikwani indicated that the university takes responsibility in solving the challenges faced by society through research and innovation. An example of such interventions include the 2015 Exhibition of the

Unyindoda Male Medical Circumcision Underwear meant to prevent infections for circumcised males. Reference was also made to the 2015 #Feesmustfall movement *albeit* with caution because it was believed that the noble cause of the students was later hijacked by political opportunism with unknown intentions (CPUT Annual Report, 2015: 4).

2.5.1 The influence of politics on the #Feesmustfall movement

What the Chair of Council omitted was that politics had an influence on the #Feesmustfall movement, and therefore it was inevitable that political parties would take interest. In addition, the transformation report highlights a number of initiatives and programmes the university undertook in 2015. These include initiatives in the areas of performance management, culture and climate survey as well as affirmative action measures (CPUT Annual Report, 2015: 57-60). Some of the initiatives may not be considered as the content and intentions might not necessarily meet the expectations of the general public. It appears that most of these initiatives and programmes were meant to strengthen CPUT from within and not necessarily strengthen the relations of the university with the general public. Research grants were received for a variety of categories of research and innovation, including indigenous knowledge systems. The CPUT Research, Technology and Innovation Blueprint strives to, among other benefits, contribute to economic growth and the Gross Domestic Product of the country through high-quality research as well as the growth of a robust cohort of post-graduate students and post-doctoral fellows across disciplines (CPUT Annual Report, 2015: 53-54).

2.5.2 The isolation of CPUT Library

When reading through the CPUT Annual Report of 2015, one gets a sense that the library is almost isolated from all the strategies, plans and programmes undertaken during that academic year. Except for information literacy programs incorporated within the university curriculum, very little is mentioned about the role the library plays within the university. However, a more detailed presentation of library activities and the support rendered to the institution can be found in CPUT libraries Annual Reports. According to the 2016 CPUT Annual Report, the vision of CPUT is “to be the innovative leading information partner enabling the institution to be at the heart of technology education in Africa”. It is interesting to note that

CPUT libraries view themselves as partners in their support of the teaching, learning and research activities of the institution. Strategic objectives, in reverse order, are:

- To be an excellent science and technology library supporting the institutional identity.
- To publicise the library's research output to the academic community and for good practices for the benefit of students.
- To support problem solving or user-inspired research, which relates to challenges faced by communities.
- To support institutional scholarly communication and/or technology transfer to industry, business, government and civil society (Chiware, 2016).

2.5.3 University-library relations

The above strategic objectives are also interesting since they reveal university-library relations in the critical areas of knowledge production, scholarly communication and technology transfer, which is also the nexus of this study. For instance, objective two reveals that there are traces of knowledge production since CPUT libraries and staff publish their own research output in accredited journals, take part in seminars to share research proposals and data with the rest of the university and research community, and attend conferences and present papers. Objective four gives a hint of how the university and its libraries view their position in terms of research and innovation that takes place between industry, government and civil society. Industry is still perceived as a leader in innovation. It is not clear though, how CPUT libraries deal with the issue of outsourcing publishing rights of scholarly communication (see Steele, 2014 and Mason, 2017 in Chapter Two) since more resources are directed at collection development by purchasing more electronic resources over their printed counterparts (Chiware, 2016). What is missing is the existence of library and information science in the academic topography of CPUT, a feat that is similar to that of TUT.

2.5.4 CPUT Libraries-community relations

CPUT libraries-community relations extend beyond the institutional and professional boundaries of the university. For instance, library staff serve on the Foundation Phase School Outreach Committee which facilitates the donation of discarded books by some of its branch

libraries to schools without libraries and those with small collections. Books are also donated to old age homes and churches. There is also a link with *Nalibali*: a National Reading and Literacy Campaign. On the marketing front, individual libraries promote their collections and activities within their communities using plasma screens during exhibitions, and the new website linked to social media such as Facebook, Twitter and YouTube. It is important to note the sensitivity of CPUT libraries and management to the student disruptions of 2015 and 2016. The student disruptions were viewed as important demands in need of attention throughout the 2016 CPUT libraries Annual Report. Again, the contents of the CPUT's libraries newsletter do not provide enough information about the history of the libraries. The newsletter is prepared to highlight operational matters for a given period of time. It is useful as an information source for the short term decision making by the executive management of the university and CPUT libraries and not necessarily the aim of this study.

2.6 Durban University of Technology (DUT)

The Durban University of Technology (DUT) was established as a result of a merger between the Natal and M.L Sultan Technikons. Its six campuses are spread throughout Durban and Pietermaritzburg where a variety of full time and part time programmes lead to tertiary qualifications. DUT has in excess of 23 000 students and employs over 1500 staff members. Courses offered to students range from Certificates and National Diplomas to Bachelors, Masters and Doctoral degrees in Technology (DUT website, 2017). Similar to other universities of technology, DUT has a dedicated focus on research and innovation, especially in the area of technology transfer. The Technology Transfer and Innovation Unit promotes innovation, technology transfer and entrepreneurship in positioning DUT as a Centre of Excellence in Technology. The focus of the unit is on elaborating indigenous technologies that have great entrepreneurial potential and can be converted into a product and create financial viability for participation. Those earmarked for participation include industry, the university itself and the general public (DUT website, 2017).

2.6.1 Directorate and Materials Organization Department

DUT libraries provide information services at the six campuses with a staff of 80. The management of the libraries is centralized through the Directorate and Materials

Organization Department. The centralized management of DUT's libraries is similar to that of TUT's libraries. The nomenclature used in naming the directorate also reveals that the focus of the libraries is organisation and storage as well as distribution. According to the Director, the libraries are a dynamic partner in the DUT learning community dedicated to the provision of full and equal access to information and the preservation of intellectual output (DUT Library Newsletter, 2016). At the centre of DUT university-library relations is information literacy. Subject librarians are responsible for rolling out the Cornerstone and General Education modules through teaching. Budgetary constraints remain a huge problem and have resulted in journal subscription cancellations. The Library Strategic plan for 2015-19 is focused on student-centredness and engagement with faculties and departments of the university, with the library goals aligned with those of the institution.

DUT's libraries have an ongoing knitting project for a children's organisation called Durban Child and Youth Care Centre. The organisation cares for 82 orphaned and vulnerable children. The knitting is done every year and rolled out during Mandela Day (DUT Library Newsletter, 2016). Although the DUT library newsletter highlights important initiatives for the year 2016, it does not provide sufficient information about the history of DUT's libraries. The scope covered by the newsletter is current and limited to initiatives for a particular year. Its relevance to the aim of this study is therefore questionable.

2.6 Summary

A selection of South African universities and their libraries were mapped in the first four sections of the chapter. These include TUT, UNISA, Wits, CPUT and DUT. Library history in South Africa has not been sufficiently studied and as a result, very few sources could be found. Both CPUT and DUT were selected because they have a library system similar to TUT's libraries. Much of the focus in this chapter was on the development of TUT's libraries since the establishment of the university in 2004. There is evidence that academic libraries across the world have become aware of the changing nature of their core activities. Researchers in disciplines such as LIS and computer science are embracing the change and proposing new methods, models and policies. In South Africa, the slow pace in the transformation of universities has contributed to the emergence of conflict. The 2015 and 2016 student

disruptions were identified as a result of the untransformed institutions of higher learning landscape.

Chapter Three: Student disruptions crisis for TUT's libraries

Introduction

This chapter sketches TUT's libraries passive response to the student disruptions of 2015 and 2016. Actual events of student disruptions and TUT's response to these protests are also addressed. It is also worth noting that in all student disruptions detailed in this chapter, the targeting of TUT's libraries was rather indirect than direct. Although TUT's libraries have not been destroyed during student protest, general damage to other university property, death and injury have been at the centre of student protests at TUT. The targeting of TUT's libraries during student protest include the disruption of learning and service provision.

The burning of the University of Kwazulu-Natal (UKZN) Howard College Law Library and other types of libraries, is used as an example and a premise to call attention to the need to locate TUT's libraries in a wider context of the knowledge system. This examples were mentioned in Chapter One as evidence that libraries are often targeted during protest because of their association with social and scientific thought, colonial identity, and political power in South Africa. The intention of this chapter is to show that the passive response of TUT's libraries to student disruptions stems from a poor understanding of the theoretical context of their support roles and functions.

3.1 A description of actual students disruptions at TUT, 2004-2015

Since the merger of former technikons Pretoria, Northern Gauteng and North West, the newly established university has experienced a share fair of student disruptions. At the core of these disruptions had been the infrastructure and service disparities that still exist between the historically black TUT campuses and the historically white Pretoria campus. This was also highlighted in Chapter Two (see 2.1 and 2.2). According to the South African History Online (2018), "student leaders and large portions of the TUT student populace have been vocal about the sub-standard quality of the historically disadvantaged institutions and the lack of effort from university management to provide better quality education and facilities…". The South African History Online (2018) also describes actual TUT student's disruptions as follows:

2008

Student disruptions at TUT started in 2008 at the Soshanguve and Ga Rankuwa campuses when students protested against fee hikes and academic exclusion. Prior to this, the university's council had decided on an average fee increase of 9%, later trimmed to down to 8.5%. This decision was done in consultation with a student representative who sits on the council. However, this decision proved unpopular as students from the Garankuwa and Soshanguwe campuses staged a protest on Monday 18 February over fees hikes and academic exclusion. Subsequently, a memorandum of demands was delivered to the university's management. A door at the lecture hall was allegedly broken by student's protesters, police fired rubber bullets and 10 students are later arrested.

After a meeting between the South African Union of Students (SAUS) and the department of education, there was no clear response from the university as indicated in the statement by the university spokesperson Wila De Ruyter:

"I do not know the outcome of the meeting as it was a closed meeting".

2009

In 2009, the then department of education provided an additional grant which enabled the university to reduce the approved class fee increase from 10% to 9%, one percent of which was to go to student bursaries. On 24 January 2009, the National Health and Allied Workers Union (NEHAWU) and the former National Union of Tertiary Employees of South Africa (NUTESU), now National Tertiary Education Union (NTEU), staged a protest over wages. This protest continued into the month of February since no agreement was reached during a meeting between the two unions and the university management. Students at the Soshanguve and Ga Rankuwa campuses were prevented from registering. As a result, the Central Student Representative Council at the Ga Rankuwa campus decided to support the strike since it affected teaching and learning. After successful intervention by the then Minister of Education Naledi Pandor and, the Commission for Conciliation, Mediation and Arbitration (CCMA), TUT council approved a general tuition fee increase of 7.5% for the following year, 2010, a 6.5% fee increase for tuition fees and 1% for bursaries for needy and deserving students as well as flat rates for residences. TUT reopened its doors of teaching and learning on Friday 20 February.

2010

There was renewed protest at the Soshanguve campus led by the student organization, Pan Africanist Movement of Azania (PASMA) and the SRC over financial exclusion and campus conditions. The university responded by obtaining a court interdict against certain members of PASMA and other student protesters on 28 January. Subsequently, the university management closed the Soshanguve campus citing lawlessness and acts of violence. Student's were ordered to vacate residences for safety reasons. Protest continued as students protested financial exclusion and eviction from residences. There was a clash between student protesters and police as stones are thrown and police retaliate with teargas and rubber bullets.

2011

On Friday 29 July, the university appointed Johnny Molefe as the new Vice Chancellor. The appointment was marred by allegations of fabricated qualifications amid support from the management of the university. The then Minister of Higher Education, Blade Nzimande appointed an independent assessor to look into the matter. The assessment identified serious problems in the governance and management of TUT stemming from the human resource portfolio of the institution. The management of the university was accused of its lack of communication with labour unions and its handling of the university's procurement process. As a result, the Minister of Higher Education invoked legislation for the dissolution of TUT's council and, appointed Professor Themba Mosia as an administrator. Members of the dissolved TUT council retaliated by applying to the North Gauteng High Court to have the decision of the minister reversed. The application at the North Gauteng High Court was ruled in favour of the dissolved TUT council.

2012

Between March and June, the CCMA ruled that Molefe's dismissal was procedurally unfair and that he should be reinstated to his original position. In June, TUT's appointed administrator Mosia argued the university wiould contest the decision. In August, student protest start again at the Soshanguve campus. Student protesters were demanding better-quality education, better hygienic conditions at residences, leniency on students who cannot afford tuition fees and management to listen to the demands of workers. A memorandum of

demands is handed over to the management of the university amid high police visibility. On August 20, TUT announces campuses will be closed until further notice.

2014

Students began protesting against a lack of funds from the National Student Financial Aid Scheme as the university opened for registration. On January 30, the university management suspended classes and closed the university until further notice. The university also obtained a court interdict stopping protests at all its campuses on 30 January. On Saturday 1 February, the Socialist Youth Movement (SYM) and TUT's SRC won an interdict at the High Court in Pretoria against the unlawful eviction of students from residences. An agreement was later reached between the SRC and the university management to allow students to move back into residences so that the university can reopen. Student protest continued into September and there were reports of damage to property and vandalism at TUT. In early November, Professor Nthabiseng Ogude resigned from her post as Vice Chancellor. There were allegations that her resignation was caused by a broken relationship between her and the TUT council. It was also alleged the university needed a leader who could unite management and listen to the demands of students.

2015

In 2015, there was a decision by NASFAS to cut down TUT's allocation of R270 million and this affected at least 20 000 returning students by the SRC's estimates. In February, students protest started again citing financial exclusion. There were major clashes between students and police at the Soshanguve, Ga Rankuwa and Mbombela campuses. TUT's management responded by suspending academic activities. After two weeks of protest, an agreement was reached between TUT student leadership and the newly appointed Vice Chancellor Professor Van Staden. The agreement included the release of R16 million from the university's merit bursary programme to 500 of the excluded students. It was also during the student protest of 2015 that Professor Van Staden announced he will be depositing funds from his salary into the bursary programme every month for a year.

TUT's libraries were not directly targeted between 2008 and 2015. However, the disruption affected learning activities and information services provided by the libraries. It is also important to note that TUT's libraries were passive throughout the timeline of student

protests at TUT. This passive response can be linked to the close relationship TUT's libraries have with the university (see also the quotation by Suttie, 2006 in Chapter Two, 2.3). This close relationship can be construed as university-library relationship that makes it difficult to locate TUT's libraries in a wider context. The idea of a knowledge system provides a social vantage point from where TUT's libraries can be located in a wider context regarding their role and responsibility in a South African society characterised by complex multiple realities.

3.1.1 Transformation initiatives and inconsistencies at TUT

The agenda of transformation at TUT had been completely frozen until the student disruptions of 2015 and 2016. During the memorial service of one of the students who was knocked down by car and killed during #Feesmustfall protest at the Sohwanguve campus, TUT Chancellor Gwen Ramokgopa declared her full support for the protest as follows:

> We said political freedom in our lifetime, and it happened. So we may be the first to support all students who are demonstrating in a highly disciplined manner (Phakgadi, 2016).

The likening of the 2015 and 2016 student protest to the struggle against apartheid by Chancellor Ramokgopa connects with the observation made by Dahrendorf on social conflicts in the introductory overview of the study in Chapter one. It is argued here that the targeting of academic libraries during social conflict cannot be simply categorized as just another political struggle. It is much more complex than it first appears and therefore needs to be treated as a special type of conflict in need of scholarly attention. This study intends to highlight such a necessity.

a. TUT Strategic documents of transformation

The first document reviewed is the discussion paper on TUT transformation compiled in January 2007. The document's purpose was twofold. To clarify terminologies related to transformation and to stimulate thought on transformation and promote debate among staff. Section 4 of the discussion document refers to the use of the term responsiveness and highlights the challenge facing TUT as follows:

> TUT therefore faces the challenge of not only being responsive to the market and economic needs of South Africa, but to be responsive, in the broader sense, to the social needs through its production, dissemination and application of knowledge (Pieterse, 2007).

The quote is relevant to this study since it acknowledges the wider societal context TUT has to consider especially as it relates to the processes of production, dissemination and application of knowledge. That said, it falls short of linking TUT's libraries to the challenge. It is not clear what the role of TUT's libraries would be in dealing with this challenge. What is even more worrying is that there is not a single mention of TUT's libraries within the twenty page discussion document. It is not clear whether the exclusion of TUT's libraries in the discussion document was deliberate or an indication of a systemic perception of academic libraries within the institution. The exclusion of TUT's libraries in the discussion document connects with the argument presented in the introduction and overview as well as the problem statement of this study. There is a need for scholarly attention on the place of the academic library within the wider context of the knowledge system. Such a theoretical framework is necessary for a better understanding of the role the academic library ought to play in society as a whole.

In 2017, the transformation agenda was revisited again at TUT. This time with some gravity taking into consideration the pressure that was exerted by the 2015 and 2016 student disruptions. Prior to the TUT Transformation Summit that took place on the 12th and 13th September 2017 at the Pretoria Campus, a thirty page draft transformation framework was compiled and distributed to staff for comments. Having read the contents of the draft transformation framework, it is worth noting the draft framework lacks concrete ideas and input on the transformation of TUT's libraries, especially how TUT's libraries relate to the discourse on "africanization" and "decolonization" of the university and the curriculum, which received more attention in the topics of interest expressed in the announcement and call for presentations as well as the draft framework. The only time library and information are mentioned in the draft framework is in a figure that shows "domains that require reflection and action" on page 18 of the draft framework (TUT Transformation Framework, 2017).

The lack of content addressing TUT's libraries in the draft transformation framework is problematic. On the one hand, it provides some insight into the contribution of the LIS community at TUT in as far as the transformation agenda is concerned. On the other hand, it reveals a consistent pattern of neglect of TUT's libraries in transformation discussions by strategic planners and advisors of TUT. This pattern of oversight can be traced back to the TUT Transformation Discussion Document of 2007. TUT's libraries should not be excluded from transformation discussions since they are implicated in the #Feesmustfall and Rhodesmustfall movements, in discourse around textbook access and affordability, the call for "free quality decolonized education", africanization of universities and curricula and the epistemological challenge. These are discussed in the next sections.

b. Transformative initiatives in TUT's libraries

The library and information services directorate has initiated a separate transformation summit post the publication of the TUT Transformation Framework 2017. The summit entitled "New Trends and Technologies: The Future and Beyond", was held on the 28th of June 2018 (see Appendix 4). The LIS transformation summit appears to have motivated library and information services researchers to reimagine TUT's libraries. A case in point is the strategic objective of TUT's library and information services to provide learning and research spaces perceived by clients to be enabling and conducive for learning and research. According to McCallum (2017), "the project will focus on four main areas: Spaces – addressing challenges with the utilization of space in the current building, as well changing user's needs; Services – the revisiting of some services in line with modern library trends; Technology – the provision of technology enabled workspaces for students; and People – the project team, library staff and university students". Although this project is still unfolding, it is worth noting the emphasis on service provision. Also, similar to the recent library and information services summit, the approach to this project appears to be aligned with the information society approach discussed in Chapter Four (see 4.7.1).

These transformative projects in TUT's libraries are commendable given changes taking place in higher education. However, there is very little evidence of how these projects link to the wider context of the knowledge system.

3.1.2 #Feesmustfall and #Rhodesmustfall movements

South African student leaders in the #Feesmustfall movement overwhelmingly attested that the challenges of exorbitant fees, access to education and affordability are based on class struggles in society. Similarly, the leaders of the #Rhodesmustfall movement believe colonial statues symbolise repressive power and class distinctions of the colonial era. It is not known what conclusive path these hashtag student movements will follow and what goals they will pursue in future. What we know is that the issues of class and power struggles are a reality in democratic South Africa. In the book *Power and powerlessness: quiescence and rebellion in an Appalachian Valley,* John Gaventa depicts sociological imaginations on how the powerful elite dominate the powerless non-elite in a society. The book is about quiescence and rebellion in a society defined by inequality. The following question was raised in the first chapter of the book:

> Why, in a social relationship involving the domination of a non-elite by an elite, does challenge to that domination not occur (Gaventa, 1980: 3)?

Gaventa (1980) raises important questions as to how power does not always operate through overt force but also happens in mysterious hidden ways. In the book, mine workers from the Appalachian Valley belong to unions, which in turn organise strikes and protests from time to time, but this does not stop mine bosses from manipulating their grievances and refocusing attention elsewhere.

The statement made by Gaventa (1980) is interesting if one is to pay closer attention to the measures taken by the South African government in partnership with universities to quell dissent and the absolute silence that followed such measures in 2017.

3.1.2.1 The Heher Commission of Inquiry Report: Libraries

Such measures include the establishment of a Commission of Inquiry into the Feasibility of Free Education chaired by retired Judge Heher. The report was eventually released on the 13 November 2017 by President Jacob Zuma. The seven hundred and forty eight (748) page document summarily reported free education in institutions of higher learning was not

feasible. Instead, a new funding model also referred to as the Income Contingency Loan (ICL) was proposed. The model proposed unrestricted commercial bank loans for students guaranteed by the government. Interestingly, the report cites case studies where the model has been successfully implemented in developed countries such as the United Kingdom and Australia. However, on the 16th December 2017 President Jacob Zuma overruled the data of the Heher Commission by announcing free education for poor and working class students (News24, 2017).

Libraries were also mentioned in the Heher report. The commission heard evidence that libraries were an increasing cost at universities. Of particular interest is the submissions made by the South African National Library and Information Consortium (SANLiC). According to SANLiC, the provision of high quality electronic information in libraries was a necessity. However, the decline of library budgets and the depreciation of the currency were mentioned as serious challenges. The Committee of Higher Education Libraries of South Africa (CHELSA) also raised its concerns about the inadequate funding model of university libraries. It was mentioned that budgetary constraints in university libraries were affected by factors such as access to print and online resources, library systems and discovery tools, wired and wireless connectivity, the lifespan of computers, software upgrades and, access to personal computers, laptops and tablets (Commission of Inquiry into Higher Education and Training Report, 2017: 319-322).

The researcher acknowledges that TUT's libraries are also affected by budgetary constraints highlighted in the report. Inadequate funding and the decline of budgets are not peculiar to TUT's libraries. It is important to recognize that the proposed model for TUT's libraries (see Chapter Seven) might not be feasible for implementation at a practical level because of financial challenges mentioned in the Heher report. Financial challenges could be averted by using a phased model during implementation. The researcher agrees with the general call for the transformation of libraries and recommendations of CHELSA in the Heher report. The general call for the transformation of libraries should encourage TUT's libraries to look for new revenue streams to implement the proposed model in Chapter Seven.

3.1.3 Textbook access and affordability

There is a general consensus among several authors that the cost of textbooks and course material at universities and colleges continues to rise at an unsustainable rate. This point was demonstrated by studies conducted at universities and colleges in the United States (US) by Ferguson, (2016) Okamoto, (2013) in Eighmy-Brown *et al* 2017) and others. In South Africa, Statistics South Africa (2014) reports that textbook prices increased by the above inflation percentage of 13,6% over the course of 2013 (Nkosi, 2014). Rising textbook costs affects the overall cost of higher education and the performance of students. In reality, failure to afford tuition fees subsequently means that many cannot afford textbooks and other course material.

However, issues of textbook access and affordability are important but peripheral within the context of this study. The focus here is on the knowledge contained in learning and teaching materials as a central aspect of social life. For instance, what are the cultural and social contexts within which this knowledge is produced and what is the position of the producer of the knowledge? Dick (1982: 18) and others specified the position of the producer of knowledge in the academic profession by arguing "epistemic communities" use a "frame of reference" in the production and application of knowledge. It is therefore, this specified position of the producer of the knowledge used in modern universities that is at the centre of the call for "free quality decolonized education" by students given the colonial past of South Africa and the rest of the African continent.

3.1.4 The call for "free quality decolonized education"

The student protests of 2015 and 2016 precipitated a renewed interest in the decolonization of the university in South Africa and, by association the decolonization of the university curriculum (Le Grange, 2016: 1). According to Le Grange (2016) discourse around the decolonization of the university and the curriculum is an important conversation and long overdue, especially given that the Western model of academic organisation on which South African universities are based; remains unchallenged. In part, South Africa's historical past of racial segregation could be blamed for the current status quo where most universities and colleges remain racially biased. The challenges facing higher education in South Africa today

could also be laid at the doorstep of the ruling African National Congress (ANC) and the slow progress made on transformation since 1994. As part of the university setup and a broader societal knowledge system, academic libraries are discreetly at the centre of the crisis in institutions of higher education because of the role they play in organising and storing as well as distributing knowledge produced for application and use.

3.1.5 Africanization of universities

According to Cross (1999: 223-258) discourse on "africanization" dominated South African politics during the days of Africanism in the early 1950's through to the early 1960's and during the Black Consciousness Movement (BCM) of the late 1960's onwards and only re-surfaced after the 1994 democratic elections. Reading through the literature, the concept of "africanization" is used interchangeably with "decolonization" and "indigenization". Within the discourse on africanizing the university, one can pick up concepts such as the "new African university", which by and large, resonates well with the call for "free quality decolonized education" by the student movements of 2015 and 2016. Admittedly, the former Minister of Higher Education, Dr Blade Nzimande has called for the "africanization of the university". In his speech at the Higher Education Summit held in October 2015, the minister reiterated that "universities, all of them, must shed the problematic features of their apartheid and problematic past" (Nzimande, 2015). The Minister made a call to all universities to look into the issue of decolonizing the curriculum.

Le Grange (2016) notes efforts to look into the decolonization issue. For instance, in the Western Cape, a curriculum committee was set up at the University of Cape Town, a colloquium held at the University of the Western Cape as well as panel presentations and discussions organised by the Cape Higher Education Consortium at the Going Global Conference held at the Cape Town International Convention Centre. In a chapter titled *Transforming knowledge production systems in the new African university*, Maringe (2017: 1) explains the use of the word "new" in the following quote:

> The term new in the title signifies a momentum gathering within post-colonial universities to embark on transformational journeys which seek to interrogate inherited and embedded episteme while

> developing new ways of conceptualizing and developing new knowledge and knowledge production systems.

While the relevance of Maringa's (2017) comments to the study is easy to pick up, it is also worth noting the prevalence of the terms "africanization" and "decolonization" within TUT structures in 2017. These terms featured in the final report of the Vice Chancellor on the Transformation Summit.

3.1.5.1 The exclusion of student disruptions in meetings

However, the same cannot be said about the library and information services community. For instance, the minutes of the first library and information services staff meeting (2017) address issues such as, upgrading of staff job profiles, after hours model, the improvement of services to students and staff just to mention a few (Library and Information Services General Staff Meeting, 2017). There is no mention of the impact of the 2015 and 2016 student disruptions on the LIS sector and how such incidents could be addressed since academic libraries were also targeted during student protests. The issue of student disruptions appears to be left for the attention of the institution's management. That said, it is still not clear how the prevalence of these terms within the upper echelons of TUT will inspire the development of new knowledge and knowledge production systems. TUT's libraries could take up this new challenge.

3.1.6 "Africanization" of the curriculum

Reading through the literature, the discourse on "africanization" appears to be have undergone several U-turns. First the discourse was around the inclusion of African languages in the core curriculum of the universities which evolved into a discourse on a complete overhaul of the Western based curriculum towards "africanization". According to Moll (2004: 15) in Council on Higher Education (2010: 50), "africanization" in the context of the curriculum entails approaching labour market supply, cultural diversity, disciplinary knowledge and academic learning from the perspective that university curricula must engage with the problems and issues facing Africa.

As components of universities, academic libraries are also impacted by the discourse on the "africanization" of the curriculum. The discourse around the "africanization" of the curriculum has implications for TUT's libraries because of their relationship with recorded knowledge (i.e. books and other similar items). Significantly, the discourse around "free quality decolonized education" and similar nomenclature such as "africanization" among Library and Information professionals can be better explained through the philosophy of epistemology. As indicated in Chapter One under the list of key terms, epistemology is the study or theory of the nature and grounds of knowledge especially with reference to its limits and validity. In LIS, epistemology can assist in deepening our understanding of the knowledge base which informs, for instance, classification schemes and collection development policies.

3.1.6.1 The importance of epistemology

According to Dick (2013) epistemology in LIS is concerned with the knowledge base which informs the systems, models, research produced and advise given by LIS professionals. Similarly, "africanization of the curriculum" in the case of TUT's libraries can mean questioning the validity of the knowledge base of university curricula. In this case, the questioning of activities, systems and models used within TUT's libraries can be split between competing epistemological traditions.

Dick (2013) highlights the competition between the scientific tradition and the hermeneutical tradition in LIS. These two traditions compete to validate the knowledge base which informs the "social status of LIS professionals, the claims they make, the research they produce, and the advise they offer". In TUT's libraries, the contested knowledge base terrain informs the activities, systems, models and policy decisions. Therefore in the case of the curriculum, the task of epistemology in LIS would be to question the decisions which inform for instance, collection development policies. On a narrower level, questioning the epistemological position of collections within TUT's libraries can assist to give direction to the agenda of transforming the curriculum to be inclusive of local epistemologies.

3.1.7 “Africanization” as epistemological challenge

Historically, academic libraries have attempted to organise and store all forms of human knowledge. For instance, attempts to control bibliography have led to the frequent use of the phrase “universe of knowledge” to refer to universality. As mentioned earlier in section 2.1, Suttie (2006) attributes such plurality and diversity to the “institutionality” or close relationship libraries have with universities. Suttie (2006) further asserts that studying the “institutionality” of libraries can disclose the multiple constituencies and interests they serve. “Africanization” of universities and the curriculum remains a challenge unless there is a general acknowledgement of the multiple realities evident in academic libraries. Epistemology in LIS can assist in dealing with multiple realities as well as generating much needed the intellectual and theoretical discourse summarized by Dick (2013: 8) in the following statement:

> The range of epistemological positions required to deal with the multiple realities of LIS generate a number intellectual and theoretical issues that can result in debate and discussion. This self–reflexive character of epistemology in LIS questions its own assumptions and methods in order to test the reliability of its knowledge claims and to eliminate false claims and errors in models and theories.

The statement by Dick (2013) challenges LIS professionals to question, for instance, the claims made about bibliographic control as a “universe of knowledge”’. A “universe of knowledge” which favours knowledge from the developed nations of the global north at the expense of knowledge from the developing nations of the global south may be questioned. It is the intention of this study to sensitise the LIS community at TUT to the range of epistemological positions available to deal with “africanization as epistemological challenge”.

Awareness of available epistemological positions can spark debate and discussion in an intellectual climate that seems to suggest what is currently known may be accepted as such without criticism. Self-reflection on the part of the LIS community at TUT would lead to the development of local epistemologies which have to compete with those of developed nations of the global north. Maringe and Ojo (2017) posit that the criterion for transformation of universities in Africa may include the development of local epistemologies which prioritise an intimate understanding of the local environment and its challenges first and foremost, before

turning to global imperatives. The proposed model in Chapter Six of this study attempts to provide solutions for this epistemological challenge.

3.2 A possible way forward

As highlighted in section 3.1.2, the student disruptions of 2015 and 2016, as well as the debates that followed these events, bring to the surface university-library-community relations. These relations occur within a broader societal framework that is society's knowledge system and warrant closer scholarly attention. Located within society's knowledge system is the library, in particular the academic library with its association with university activities such as teaching and learning as well as research. It is argued that South African national discourse on the transformation of universities is narrowly conceived and lacks a scholarly perspective on the manner in which academic libraries within society's knowledge system relate to both academia and the general public.

The narrow focus of libraries on organisation and storage, as well as distribution at the expense of related processes of knowledge production, application and use is also not helping the situation. Society's knowledge system is rapidly changing and this has adverse effects on higher education and the activities of academic libraries. The inability to observe these changes by policy makers in the domains of government, economic development and academia encourages suspicion by students since they are directly affected by the seemingly stagnant nature of systemic institutional structures.

A possible way forward is to highlight evidence of the knowledge system across various disciplines. It is also important to show the connection between academic libraries and research libraries. This is followed by an evaluation of models that shape activities of academic libraries, higher education and society's knowledge system in Chapter Four.

3.3 Summary

This chapter briefly sketched TUT's libraries passive response to the student disruptions of 2015 and 2016. It also addressed debates and discussions that followed the student disruptions of 2015 and 2016.

Chapter Four: Academic Libraries and Knowledge Systems

Introduction

In Chapter One it was argued that the institutional support role played by academic libraries to universities, their historical connection with research libraries and their link with the wider functions relevant in society's knowledge system problematizes their position when responding to social conflict. This chapter outlines the historical connection academic libraries have with research libraries. A comparison of the national variation of this connection is made between American, British, German and Australian library culture. It is important to note that the formulation of attitudes towards higher education by government in South Africa has been influenced by American and European examples, especially British and Australian models throughout the country's colonial history and during apartheid (see also section 4.1 in this chapter for models of higher education).

In addition, a broad outline of how modern society's knowledge system manifests itself across selected disciplines is provided in the first sections. The theory of society's knowledge system is essential to understand how the interaction between the processes of knowledge production, organisation, storage, application and use occur within subsystems and entities which are related to a larger social context. As the reader will uncover in the next chapters, university-library-community relations manifest themselves within society's knowledge system. The words society and community are used interchangeably to refer to both academia and the general public. Academic libraries, university libraries, research and special libraries are also used where they apply in specific instances throughout the chapter.

4.1. Historical connection between academic libraries and research libraries

The connection between academic libraries and research libraries is traced back to the earliest development of university libraries among European nations. This is not to say that this was not the case in other nations of the world. Most of the literature available on the connection between academic libraries and research libraries is written in English, which is the most accessible for the researcher. The connection between academic libraries and research libraries gained momentum during and after World War II when the need for research and development in specialized disciplines such as mathematics and engineering

was emphasized. To start with, a definition of a special/research library is necessary. Kent and Lancour (1968: 105) used the terms research and special library interchangeably and wrote:

> A special library/research library's function is to serve the needs of personnel of the parent or sponsoring organization. Its collection is specialized in nature, it is oriented to support and serve the subject interests of the parent organization. It must in addition, give attention to the collection of materials in fields which border on or relate to those of primary interest to the organization it serves.

This phenomenon of specialization in academic and research/special libraries began in the US, swept across the world and was later adopted by other nations of the world. It is relevant then that the definition of a special/research library by Kent and Lancour (1968) links to the institutional support role of an academic library in a university.

4.1.1 Background in Britain

According to Tidmarsh in Saunders (1968), seminar libraries in German universities influenced some librarians in European nations to set up departmental libraries opposite large research collections. While the first substantial item of information on a university library appeared in 1894, it was reported that at Aberdeen University Library for instance, there was already a growing awareness of the needs of readers. Opening hours were extended and books were issued and not merely kept. During this period, both Oxford and Cambridge University Libraries had already considered themselves research libraries. These academic libraries' main focus was on providing material for the scholar who was expected to have already acquired bibliographic skills in their own field.

The commitment and responsibility of the Aberdeen University library to become a research library was captured by the Aberdeen University Library Committee in a report submitted to the University Court:

> Its responsibilities are not to supply students textbooks, which they may buy from class libraries, but to provide treaties and reference books, transactions of learned societies and leading journals as recommended by the teaching staff to further the research of staff and graduates (Tidmarsh in Sauders, 1968: 41)

The quotation attests to the historical overlapping nature of academic libraries with research. Interestingly, the tradition of teaching staff making recommendations to academic library staff as to what material may be included in academic library collections goes back in time. The only difference is that, as in the case of Aberdeen University Library, recommendations from academic staff were meant for advancing the research interests of staff and graduates. In South Africa, the historical connection between academic libraries and research libraries is overshadowed by the current context and functions in academic libraries. For instance, current recommendations by academic staff members to TUT's libraries for collection development purposes focus more on the inclusion of discipline specific textbooks for students and less on leading journals, treaties, reference books and transactions of learned societies.

Policy and practice may differ at other South African university libraries. This narrow focus of the functions of TUT's libraries is problematic since it overlooks wider functions that are relevant to society's knowledge system.

4.1.1.1 Instruction and wider functions in university libraries

The influence exerted on British university libraries by German seminar libraries necessitated the need for instruction in university libraries. The British Library community felt that departmental libraries could be used by undergraduates as "practice" in using a large research collection. American libraries were the first to introduce instruction programmes detailing the use of the academic library. By the 1920s these program were becoming widespread in Britain (Tidmarsh in Saunders, 1968: 40).

By 1921, there was a general recognition that, in addition to the institutional support role, the university library had links to wider functions that were relevant to society's knowledge system. This is encapsulated in the quotation by the University Grants Committee:

> An adequate library is not the basis for all teaching and study, it is the essential condition of research without which additions cannot be made to the sum of human knowledge (Tidmarsh in Saunders, 1968: 42).

In the preface to the book, *University and Research Library Studies (…)*, editor W.L Saunders asserts that departmental libraries of universities have complex origins. They were shaped by the powerful influence of a few exceptional individuals notably scholar–librarian Sampson and wealthy benefactors Christie and Tate (Saunders, 1968: x). Influence by exceptional individuals and corporations on academic libraries and research libraries explains the careful division between teaching departments which became standard practice. Furthermore, reference to a locus of influence also echoes the quotation by Suttie (2006) in Chapter Two section 2.3 about the contradictions and complexities which define the role of academic libraries in universities as well as the diverse interests they serve.

Similarly, the quotation by the University Grants Committee is important since it highlights that the historical connection between academic libraries and research libraries has been shaped by the willingness of exceptional individuals to sponsor collections that satisfy specific sponsorship interests.

4.1.2 Private sponsorship of collections in America

According to Drake (2003), most of the universities in the US started as private colleges at the time when tax laws favoured donations by private individuals, foundations and corporations. For instance, Thomas Jefferson gave his collection to the University of Virginia as charity and this collection created the university's first proper library. Similarly, the private collections of Harry Elkins Widener were given to Harvard by his family after he became a casualty in the Titanic disaster. "It was only after the publication of Darwin's *Origin of the Species* and the establishment of land grant colleges that education adopted a philosophy of scientific inquiry" (Weiner, 2005). In order to support scientific inquiry, academic libraries began to build competitive collections that would assist research and development and specialization. For example, the formation of the National Advisory Committee for Aeronautics culminated in the establishment of the aeronautic-type special/research library in 1914 following the establishment of the Special Libraries Association in 1909.

4.1.3 The Australasian case

According to Jolley in Saunders (1968: 2), there is a common library and cultural tradition between British and American university libraries as well as between Australian, Scottish and British university libraries, with a few exceptions. As mentioned already, this common library and cultural tradition has exerted its influence generally on South African higher education during its colonial and apartheid past (See 4.3.1; and 2.2.6.1). In Australia, the founding of the post graduate Australian National University contributed to the rapid development of post graduate studies between 1946 and 1966. As a result, Science departments in state universities had well established research libraries followed by the social sciences and humanities. Jolly in Saunders (1968: 3) summed up the connection of academic libraries and research libraries in Australia by emphasizing that "university libraries may be considered in the wider context of the community the universities serve".

Moreover, Singapore is rated third in the INSEAD Global Innovation Index and first in the Innovation and Information Technology Foundation's 2011 Innovation and Competitiveness report. Its economy is mostly knowledge based and its successes are attributed to some of its best universities and their special/research libraries. For instance, the Hon Sui Sen Memorial Special Library, which started operating in 1987, is situated within the National University of Singapore which caters to the faculty of Business Administration and the Graduate School of Business (Drake 2003).

As discussed in previous sections, the influence private persons have on academic libraries in the US for example, shows that most academic libraries were modelled along the first private collections received from individuals. For example, a collection of the University of Virginia library started with a private collection donated by Thomas Jefferson would reflect the level of specialty or personal interest of the donor. Similar to research libraries, academic libraries also support both students and staff in their teaching, learning as well as research activities. In addition, both have a focus on specialized knowledge which is necessary for students and staff to solve practical problems across various specialized disciplines. University faculties and departments can also use both collections of both libraries to detect gaps in knowledge thereby producing a new body of knowledge that can assist with the maturity of various

disciplines. Since World War II, developed countries have relied on the knowledge produced, applied and used in research/special libraries, mostly operating within universities, to grow the economy, foster a culture of innovation and improve the lives of their people.

To emphasise the value placed on knowledge production, application and use as wider functions of academic libraries relevant to society's knowledge system, previous sections have sought to show the historical connection between academic libraries and research libraries. The narrow focus of academic libraries on organisation and storage, distribution and access does not do justice to the historical connection academic libraries have with research/special libraries.

The next sections address evidence of the knowledge system across various other disciplines, including Library and Information Science.

4.2 The Knowledge System in Sustainable Development

The next section sections will examine a number of knowledge systems that could be helpful in positioning academic libraries. The Massachusetts Institute of Technology (2017) and their team for Global System for Sustainable Development define a knowledge system as follows:

> An organized structure and dynamic process (a) generating and representing content, components, classes, or types of knowledge, that is (b) domain specific or characterized by domain-relevant features as defined by the user or consumer, (c) reinforced by a set of logical relationships that connect the content of knowledge to its value (utility), (d) enhanced by a set of iterative processes that enable the evolution, revision, adaptation, and advances and (e) subject to criteria of relevance, reliability, and quality.

On the 25th of September, signatory countries adopted the United Nations (UN) strategic goals on sustainable development. Among others, goal 11: sustainable cities and communities and goal 12: responsible consumption and production were declared for adoption (United Nations, 2005). South Africa is also a signatory to the strategic goals influenced largely by the ongoing debate on climate change and a sustainable future. These strategic goals on sustainability by the UN have implications for academic libraries. In many parts of the world,

academic libraries in universities are part of cities and their communities. Using the case study of Macquirie University in Australia, Brodie (2012) highlights how libraries' interest in issues of sustainability has become part of national discourse by different interest groups. These include the International Federation of Library Associations Special Interest Group on Environmental Sustainability, the American Library Association Task Force on the Environment and the Australian Library and Information Association Sustainable Libraries Group. The consumption of finite resources for profit by multi-national corporations is a genuine concern of society. Within a broader knowledge system on sustainability, academic libraries may look into sustainable design and operation of collections, and the reframing of library organisational design and service provision for the future (Brodie, 2012: 4-5).

In South Africa, academic libraries could take an interest in the concept of "green libraries" and many similar concepts under the banner of sustainable development. However, this could only happen if sociological studies into librarianship apply holistic approaches as is the case with the knowledge system context in this study.

4.3 The Knowledge System in Computer Science

According to Wagner (1998: xxiv), the concept of a knowledge system constitutes a useful framework for the classification and comparison of various computational systems and formalism such as relational, temporal and deductive databases. Computer Science is one of the disciplines, which is challenging Library and Information Science on factors such as knowledge organisation and storage (Hjórland, 2008: 86). For instance, historical classification systems such as the Dewey Decimal Classification System (DDC) and others are being forced to adapt to the era of the internet. The multiple realities brought about by the proliferation of the internet and its ability to link with telecommunications are forcing academic libraries to think about new ways to perform their traditional functions. In order to survive, academic libraries need to look beyond their physical walls and become part of a broader knowledge system distributed across society.

According to Hjórland (2008), accommodating contributions from other disciplines is crucial since knowledge organisation in the narrower sense of the traditional academic library cannot

develop a fruitful body of literature without consideration of the broader meaning, which can be found in other disciplines within society's knowledge system. Saumure and Shiri (2008: 655) attest that "steps were being taken towards the use of machines in organizing knowledge….that the creation of programs such as FASIT (Fully Automatic Syntactically Based Indexing of Text) revealed that the ability of computers to index materials was being explored". In the post-web era the trend has shifted to accommodate the classification and cataloguing of electronic records.

One can attest to this trend by mentioning the growing availability of digital libraries today. Although some argue the principles of classification are still the same, Saumure and Shiri (2008: 656) indicate that much of the focus on precision and relevance has changed to interoperability where, for example, there is an emphasis on developing new standards for the web environment such as Metadata Encoding and Transmission Standard (METS), Dublin core and XML protocols. These protocols assist robots to index information from a network of interconnected databases and websites, mostly driven by the internet. Notable examples in new developments in classification schemes include the introduction of the MARC 21 format and the online version of the Dewey Decimal Classification System also known as Web-Dewey. The pervasive nature of Computer Science in Library and Information Science is so embedded in the core functions of university libraries it is becoming difficult to study librarianship without a deeper understanding of external influences (see also section 2.2.8 in Chapter Two). TUT's libraries are also affected by these external influences.

4.4 The Knowledge System in Psychology

Henriques (2003) provides a new epistemological system that helps examine how psychological science exists in relation to other sciences. Termed the *Tree of Knowledge Systems* (TOK), the new epistemological system attempts to unify opposing paradigms of two notable contributing scholars, B.F Skinner and Sigmand Freud. According to Henriques (2003: 178), the TOK system is a meta-theoretical framework whose analysis has made it possible for a unified theory of psychology. There is no doubt debates in the discipline of Psychology on interdisciplinarity also exist in Library and Information Science. Debates between Marcia

Bates and Birger Hjórland around the many available definitions of information as a central concept of study in information science are one example.

Hjórland (2011) criticizes Bates for defining information using an essentialist and evolutionary approach. In response, Bates (2008: 842) argues that her ideas were misrepresented, that information can be both objective and subjective. Intense as the debate was, both Bates and Hjórland's positions are useful for the growth of the discipline of information science in the same way Hendriques, (2003) and others have contributed to the discipline of psychology. After all, "it is the essence of science to have debates and disagreements over ideas and theories" (Bates, 2008: 842). Criticism levelled against the evolutionary position in the discipline of psychology has implications for the ideas of Bates (2008) in information science regarding collaboration between disciplines. According to Jackson (2010), "evolutionary psychology offers an essentialist definition of culture and thus offers a much less promising vision of interdisciplinary collaboration".

Within the context of this study, an approach of academic libraries from the point of view of a knowledge system highlights the importance of collaboration with other disciplines. TUT's libraries could benefit from approaching issues from a multi-disciplinary standpoint within the wholeness of society's knowledge system.

4.5 The Knowledge System in Knowledge Management

MacFadden (2000: 43) asserts that the Organizational Knowledge System (OKS) is a holistic synthesis of the organisational learning and organisational knowledge literature. It was conceived to close a gap that existed in the literature on organisational learning and organisational knowledge. As a methodological way of thinking, OKS consists of four subsystems: information acquisition, information storage, and interpretation and information dissemination. As a field of information science, OKS encompasses subsystems which are akin to the core functions of academic libraries. For instance, a more resource-based approach reveals "information acquisition" in knowledge management could be tied with collection development in academic libraries.

In general, libraries are traditionally known to organise and store recorded knowledge in the form of books and other resources. The acquisition of these resources is guided by collection development policies. The interpretation of information occurs when researchers in library and information science undertake research and produce specialized technical knowledge. Such output is then disseminated across various platforms for application and use. McFadden's (2000) attempt to unify organisational learning and organisational knowledge in the field of knowledge management could be helpful for unifying the functions of organisation and storage, distribution, application and use in academic libraries with the production of knowledge within society's wider knowledge system.

4.6 The Knowledge System in Sociology

In the book *Knowledge application: the knowledge system in society*, Burkart Holzner and John H. Marx emphasize the relevance of the sociology of knowledge for librarianship. Reading through the book, information professionals are not addressed directly as indicated by the following quote:

> We address an audience of those interested in the sociology of knowledge and sociological theory, but we hope to find interest among…practitioners in the personal services professions (Holzner and Marx, 1979).

However, the book's relevance to Library and Information Science is evident in the following statement:

> Our concern lies with the manner in which the production, organization, distribution, application and utilization of specialized; technical knowledge has transformed social life by creating a postmodern knowledge base economy (Holzner and Marx, 1979).

Holzner and Marx's (1979) criticism of the "social constructionist school of thought" and its examination of knowledge is in contradiction to the ideas of Schutz, Berger and Luckman and therefore challenges the norms of culture free centres of knowledge production such as universities. It is at these universities where the concern for knowledge production is primary and social controls on thought, imagination and action are lessened. It could also be assumed that the notion of universities as culture free centres makes the knowledge organised and

stored by the library immune from criticism by users for as long as it serves the norms and values bound by institutional character. The fact that users concern themselves with knowledge given and treat it as incoherent and less integrated poses a great risk to a deeper understanding of the origins and the reasons it was produced in the first place. This is well explained by Schutz in the following quotation:

> The knowledge distributed within society is not integrated…it is a mere juxtaposition of more or less coherent systems of knowledge which themselves are neither coherent nor even compatible with one another. Where our practical interest predominates we are satisfied with our knowledge that certain means and procedures achieve certain desired or undesired results. The fact that we do not understand the Why and the How of their working and that we do not know anything of their origin does not hinder us from dealing undisturbed with situations, things and persons (Schutz, 1946: 463).

The quotation by Schutz (1946) clearly has implications for the manner in which knowledge is applied and used in society. In the case of TUT's libraries, knowing the origins of a book or the social context within which it was produced might be the least of the worries for students and staff who have only one aim: to apply and use the knowledge contained within the book to complete the learning and teaching mandates of the university.

Holzner and Marx's (1979) perspective is based on a branch of classical sociology of knowledge essentially concerned with ideologies and belief systems. Swidler and Arditi (1994) argue for a new sociology of knowledge by examining how kinds of social organisation make whole orderings of knowledge possible rather than focusing on the differing social locations and interests of individuals or groups. The authors further claim that newer work in sociology and cultural studies suggests that formal systems of ideas are linked to broader cultural patterns. They review how the structure of the media through which knowledge is organised, stored and transmitted has a direct effect on the content, citing the introduction of print for formalized forms of knowledge as an example. Collective memory is also review to investigate social conditions which determine how knowledge is transmitted through time (Swidler and Arditi, 1994: 308).

Sections that are more relevant for this study are the ones on authority and organisation as well as power. Swidler and Arditi (1994: 310-314) provide for a theoretical analysis on authority relations as an example of a broader movement in the sociology of knowledge towards attention to the specific organisational contexts in which knowledge produces work. A section on authority and organisation examined institutionalization and how the workings of authority within organisation influences knowledge to derive its features from the way knowledge producing communities are organised. Cited in the review by Swidler and Arditi (1994) are the works of Ortner, (1984) and Lamont and Withnow, (1990), in particular the work of Michel Foucault (1973) who has written about changes in "epistemes". For instance, Foucault did not only focus on systems of classification, but the logic in terms of which these classifications are constructed. Power is said to be embodied in the practices and techniques of epistemic communities. Indeed, Dick (1982:18) also emphasizes the role of epistemic communities in universities where academic disciplines are structured around frames of reference. For Swidler and Arditi (1994), the unequal power between the colonizer and the colonized has implications for the producers of knowledge within specific contexts and therefore, an effect on the content produced.

It therefore appears that the knowledge system approach to the sociological study of librarianship could bridge the disconnect that exists between traditional functions of academic libraries and their relevance for society's knowledge system. Thus questions such as who produces the knowledge and within which social context could be asked. After-all, the knowledge organised and stored by these libraries has origins and this requires scholarly attention.

4.7 The Knowledge System in Library and Information Science

Based on the ideas of Holzner and Marx (1979) and others, Dick (1982: 17) argues for a "reality constructionist" approach that perceives knowledge as being socially constructed. Contrary to the constructionist approach, the reality constructionist approach is not concerned with ideologies or belief systems but the social context within which knowledge was created and the consequences for social life after use.

According to Dick (1982) society's knowledge system consists of knowledge production, organisation and storage, distribution and accessing as well as knowledge application and use.

The link between the functions of academic libraries, which are also relevant in society's knowledge system, provides a great platform to zoom in on the current context and functions of, for instance, TUT's libraries. To do this we need to find connections between the current focus of TUT's libraries and other processes of the knowledge system, summarized as follows:

> Although libraries are more narrowly concerned with the second and third elements, the other two also have implications for libraries. For example, the content of the library collection can be seen in connection with knowledge production. In addition, the fact that the library is used as a source of research or as an information centre to seek answers to practical problems can be seen in relation to knowledge application (Dick, 1982: 17).

The context and functions of TUT's libraries on organisation and storage, distribution and accessing shows a disjuncture with other functions relevant to the wider context of society's knowledge system. Hence the unique type of social conflict for academic libraries highlighted in Chapter One.

Any reference to society's knowledge system has to consider the concept of the knowledge society and the manner in which librarians and researchers in library and information science approach it in the literature. The arrangement of entities and sub-entities and the network of processes, communications and interactions that takes place between several role players can be referred to as a knowledge system but the ultimate goal is to work towards an ideal society or a knowledge society.

The following sections will unpack the notion of the knowledge society with two objectives in mind. Firstly, to highlight how the information society and knowledge society have been studied extensively without any connection to the wider context of society's knowledge system. Secondly, to show how academic libraries are influenced by the wider context of society's knowledge system and how their roles are shaped by multiple social realities of a knowledge society. A knowledge society approach that principally focuses on Information and

Communication Technologies (ICTs) and digital networks does so at the expense of the knowledge system context which has received little scholarly attention in LIS.

4.7.1 The Knowledge Society approach

As indicated in this chapter (see 4.2 to 4.7), evidence of knowledge systems shows there is a wider context within which academic libraries operate. Such evidence also shows how modern societies are organised and can assist us in understanding the balance of forces between economics, politics, social and cultural life. Since the concepts of an information and knowledge society reached global attention at the World Summit on the Information Society (WSIS) in Geneva in 2003, there has been an increase in the volume of literature on the knowledge society approach. Researchers across disciplines as well as politicians and business executives have written about the information and knowledge society.

The World Summit on the Information Society in 2003 in Geneva defined the information and knowledge society as "a society in which people interact with technology as a fundamental part of life and social organisation to exchange information on a global scale" (International Telecommunications Union, 2003). It is clear from the definition by WSIS that initially the approach of the information and knowledge society was on the technological infrastructure needed for people to create, organise and be able to share information across national borders for economic development. It is therefore not surprising that available research in the discipline of Library and Information Science (LIS) on the information and knowledge society mostly covers the use of Information and Communications Technologies (ICTs) to empower local communities, as well as previously marginalized groups. Studies by Holmner (2008, 2011), Jiyane *et al* (2013), Nassimbeni (1998), Hamid and Zaman (2008) and others attest to this.

The overuse of ICTs for information transmission and access, the justification of the empowerment of local communities and marginalized groups, such as women, all encompass the overall approach. Little or no connection is made to the wider knowledge system context and its processes, how these processes interrelate and the consequences for the envisaged information and/or knowledge society. It not clear how the concept of the information society

links to the wider context of knowledge systems, especially regarding the creation, transmission, application and use of specialized technical knowledge, which is the lifeblood of economic development, public policy making and education. Researchers who focus on the information and knowledge society approach in LIS neglect the wider context of a knowledge system, and therefore deal with the concepts at a basic level.

For instance, Holmner (2008) identified a criteria used by developed countries to measure a knowledge society. In a subsequent study, Holmner (2011) highlights the challenges faced by developing countries in their efforts to become knowledge societies in line with The United Nations Millennium Development Goals (UNMDG). She identified indigenous knowledge systems being used by developing countries as alternative strategies to assist them progress towards UNMDG. Jiyane *et al* (2013) investigates the benefit of information and knowledge societies for informal sector women entrepreneurs. Nassimbeni (1998) as well as Hamid and Zaman (2008) assert that very few models and indicators have been developed to measure information and knowledge society status, especially in developing countries. This oversight is also evident in the work done by the Higher Education Library Interest Group (HELIG) affiliated to the Library and Information Association of South Africa (LIASA). For instance, their efforts have mostly been directed at the governance of the interest group as indicated by Chairperson Ina Smith in the 2014-2015 and the 2014-2016 annual reports respectively. In addition, most of the activities of the interest group have been dominated by engagements in information literacy, ICT tools and online journal management (HELIG Annual Report, 2016).

As components of universities, academic libraries support faculties and departments organised as academia. Any attempt to study the arrangement of a society at a certain point in time may take into consideration the wider context of the knowledge society in relation to knowledge systems (see Chapter One, section 1.9.6 for definition). It is imperative to link the knowledge society approach with the wider context of knowledge systems for understanding the ideas of the knowledge society. One of the objectives of this study is to examine the current context and functions of TUT's libraries in light of developments in higher education in South Africa and elsewhere in the world (see also objectives in Chapter One).

What then, does a knowledge society entail and how can it benefit from the wider context of knowledge systems?

4.7.1.1 Some key sources and ideas of the Knowledge Society approach

The concept of the knowledge society follows on the idea of an information society. Both the concepts of an information and a knowledge society are often used interchangeably and can be confusing.

a. Fritz Machlup

Fritz Machlup is one of the authors credited with the conception of a knowledge society. In the book, *The Production and Distribution of Knowledge in the United States* (1962), Machlup investigates the manner in which the allocation of resources to education, research and development increases the rate in the production and distribution of specialized, technical knowledge. While both the terms knowledge and society are used loosely in the book, it is clear specialized technical knowledge was becoming the cornerstone of the American economy at the time of publication. Most importantly, Machlup (1962) highlights the division of labour in society as the basis upon which we can differentiate productive knowledge from unproductive knowledge. For instance, research work is referred to as "pure brain work" while physical performance jobs are those done by secretaries and executives. Another author credited with a sound explanation of the knowledge society after Machlup is Peter F. Drucker.

b. Peter F. Drucker

In the essay, *The Rise of the Knowledge Society* (1993), Drucker narrates how the transformation of the meaning of the term knowledge among Western, European and Asian nations introduced capitalism and technology throughout the ages. As a result, the diffusion of capitalism and technology across the globe changed geography, created social classes when capital and labour were the core assets of the capitalist machinery. After World War II, specialized technical knowledge replaced capital and labour as a new meaning was applied to knowledge in a new era referred to as "post capitalist" (Drucker, 1993: 54). It is important to

note that specialized technical knowledge enables organisations to thrive. Such organisations can include universities, academic libraries, government departments and similar others. Towards the end of the essay, Drucker (1993) asks a pertinent question around what the role of the educated person may be in an ideal knowledge society and answers as follows:

> Tomorrow's educated person will have to be prepared to live in a global world. It will be a Westernized world. But educated people will also live in increasingly tribalized world. They must be able to be citizens of the world-their vision, their horizons, their information-but they will also have to draw nourishment from their local roots and in turn, enrich and nourish their own local culture (Drucker, 1993: 70).

Drucker's quote is important in that it places education as an instrument in the creation of a knowledge society. It encourages the educated to be wary of loosely translating the human development opportunities that come with the knowledge society without political, cultural and social consideration. It also reveals a new type of socialization where the dominance of science for decision making requires a mutual understanding of different types of knowledge. Significantly, it draws attention to the need for local epistemologies to be nourished. Developing countries such as South Africa can draw inspiration from Drucker's assertion.

c. UNESCO Report of 2005

The United Nations Educational, Scientific and Cultural Organization (UNESCO) Report of 2005 entitled *Towards Knowledge Societies* defines knowledge societies as follows:

> Knowledge societies are about capabilities to identify, produce, process, transform, disseminate and use information to build and apply knowledge for human development. They require an empowering social vision that encompasses plurality, inclusion, solidarity and participation (UNESCO, 2005).

UNESCO's definition makes a connection with points raised earlier by both Machlup (1962) and Drucker (1993). While Machlup (1962) recognised that specialized technical knowledge was becoming a key element of the American economy, UNESCO is concerned that knowledge societies based on the techno-scientific model will thrive at the expense of non-scientific knowledge societies. It also connects with the assertion made by Drucker (1993) on the dual responsibility of the educated person, that of embracing plurality and encouraging

participation of other cultures in the knowledge chain. Also, the change from a singular society to societies in the title of the 2005 UNESCO report should be noted. It challenges us to think broadly about the idea of knowledge systems. After all, knowledge has always been part of societies across the world. This simply means knowledge societies and systems have always existed. Therefore, by asking the question: what types of knowledge are we talking about, UNESCO raised a pertinent issue relating to the general notion that ordinary people need to understand science because "decision making is increasingly associated with science, and those, who do not have the idea what science is, are disregarded" (Mackenzie, 1998).

The 2005 UNESCO report cautions about the extensive commodification of knowledge and rejects technological determinism in favour of the diversity of knowledge societies. It challenges us to think critically about, for instance, collection development and management as well as the classification systems used in academic libraries (see also 2.2.4 and 2.2.8). Criteria used to develop collections in TUT's libraries is based on the library resources needed by faculty and departments. This simply means the courses offered at a particular campus dictate the criteria and not the diversity of communities in that particular location. Also, the current use of the DDC within TUT's libraries is influenced largely by the need to store and organise available knowledge and not the diversity of knowledge societies per se. Researchers in LIS should take into consideration the paradigm shift by UNESCO on the knowledge society approach in order to consider alternative approaches.

d. UNESCO Report of 2013

In 2013, UNESCO commissioned Professor Robin Mansell and Professor Gaetan Tremblay to compile a report prepared for the UNESCO's World Summit on the Information Society+10 Review Event. The contents of the 2013 UNESCO report are too extensive to be covered in this section. In brief, the initial vision of the information and knowledge society has moved beyond a focus on the information and communication infrastructure to human beings and the processes of learning. Importantly, knowledge societies are not emerging in isolation from other large scale changes in society (Mansell and Gaetan for UNESCO, 2013). Indeed, changes taking place in society also mean a realignment of the knowledge system, which directly affects both universities and academic libraries. It is the purpose of this study to highlight

these changes while corroborating the observations made by UNESCO about the initial knowledge society approach. It is true that the policy environment is currently focused on technology and digital information thereby neglecting other issues. Generally, the guidelines and strategies for action provided by the 2013 UNESCO report may be applauded. They look good on paper and appear realistic, however, challenges abound.

- Selected guidelines in the UNESCO 2013 report

For instance, guideline number 3 emphasizes "the rapid circulation of scientific knowledge in all parts of the world, especially in less developed areas, as a high priority". It may be of great concern that UNESCO advocates for the facilitation of rapid circulation of scientific knowledge to all parts of the world. Knowledge means different things to different people (Drucker, 1993: 56). While the call for facilitation of scientific knowledge to all parts of the world is by intent, good, the desired outcomes might not be so good.

Making scientific knowledge available for local communities does not necessarily mean it will be put to good use. In any case, libraries, and in particular, academic libraries, have a responsibility to ensure the influx of such scientific knowledge produced elsewhere is used and applied for the development of local communities. As it stands, academic libraries do not seem to be ready for this task because of their narrow focus on organisation, storage and distribution. Their historical connection with research libraries and oversight of wider functions relevant in society's knowledge system problematizes their response to social conflict. Locating academic libraries within the wider context of society's knowledge system can assist in preparing them for this task, that of participating in knowledge production activities in addition to their traditional core focus areas.

- Ethics and environmental sustainability

Other important issues raised in the 2013 UNESCO report are issues of ethics and environmental sustainability. This is important given the possibility of varying motivations for different knowledge societies across the world. We know from Machlup (1962) and others that industrialized and developed nations of the global north rely on specialized technical knowledge to keep their economies competitive. Unfortunately, highly competitive

economies tend to use their knowledge base to persuade lesser developed nations to allow access to their natural resources. Such relationships can take a top-down approach and in the process violate the human and intellectual property rights of smaller countries.

e. Robert E. Lane

Another interesting definition is offered by Lane (1966) in an article entitled *The Decline of Politics and Ideology in a Knowledgeable Society*. Robert E. Lane is also credited as one of the authors who attempted to pin down the definition of a knowledge society after Machlup (1962). Lane defined a knowledge society as follows:

> The knowledge society is one in which, more than any other societies, its members: (a) inquire into the basis of their beliefs about man, nature and society; (b) are guided (perhaps unconsciously) by objective standards of veridical truth, and the upper levels of education, follow scientific rules of evidence and inference in inquiry; (c) devote considerable resources to this inquiry and thus have a large store of knowledge; (d) collect, organize, and interpret their knowledge in a constant effort to extract further meaning from it for the purposes at hand; (e) employ this knowledge to illuminate(and perhaps modify) their values and goals as well as to advance them. Just as the democratic society has a foundation in governmental and interpersonal relations and the affluent society, a foundation in economics, so the knowledgeable society has its roots in epistemology and the logic of inquiry (Lane, 1966:650).

A connection can be made between Lane's (1966) line of thought in the quotation and the inclusive approach taken by UNESCO in its appropriation of knowledge societies. It is clear that once a "knowledgeable society" has been established, it tends to distinguish itself from other "knowledgeable societies" along the lines of higher levels of education, scientific rules of inquiry and inference in inquiry. Of course, this line of thought is not different and builds on the ideas of Machlup (1962). The last part of the quotation is equally important since it reveals epistemology as the root of a "knowledgeable society".

4.7.1.2 Shortcomings of the knowledge system context

This section identifies shortcomings of the wider knowledge system context as it relates to the ideas of the knowledge society approach. These are evident in the key sources consulted on the knowledge society approach. The first shortcoming of the knowledge system context

is its focus on modern contemporary societies. Societies which are still broadly structured according to primitive knowledge systems of the ancient world can find it difficult to participate in the processes of the knowledge system of modern contemporary societies. Within modern contemporary societies, university education is an instrument while universities are centres of the production of specialized, technical knowledge. Such an arrangement calls into question the plight of indigenous knowledge systems.

In many parts of the world, and Africa in particular, traditional localized or situational knowledge exists (Lillejord and Mashile, 2004). The authors further assert that indigenous knowledge may be included in modern knowledge producing institutions such as universities so as to create a balance between available forms of knowledge. In addition, systematic specialized technical knowledge dominates over any other form of knowledge in modern contemporary knowledge systems. This is another shortcoming. It means decisions for modern contemporary society's well-being are mostly based on science. This is problematic since science dominates economic development, public policy making as well as academia. Lessons learned from Machlup (1962) and others indicate that the most industrialized of nations in the world rely on specialized, technical scientific knowledge for their economic development. This has been the case since the end of World War II and has since resulted in what is often referred to as the "knowledge explosion". As a result, research output in these developed nations of the global north far surpasses those nations in the global south.

The phenomenon of "knowledge explosion" automatically gives developed nations of the global north an unfair competitive advantage over the developing nations of the global south in the area of economic development and education.

4.7.1.3 Benefits for South African academic libraries

South African academic libraries can reap great benefits from the wider knowledge system context. Conditions for such benefits already exist in many of the modern contemporary universities available in the country. As components of these universities, academic libraries can take part in knowledge production activities in addition to their traditional core focus of organisation and storage as well as dissemination of knowledge. This will in turn supplement

the research output of their respective universities. Improved research output of universities is good for the competitive advantage of South Africa in the areas of economic and human development.

Human development entails empowering citizens with skills. Economic development entails dealing with the challenges of poverty, unemployment and inequality. For this to happen, academic libraries can partner with local communities and tap into the reserves of indigenous knowledge systems. The abstract nature of local indigenous knowledge requires some form of systematization for it to be globally understood and be able to make a meaningful contribution to society. Such a partnership would be crucial for the transformation agenda of the academic library in terms of adding knowledge diversity to collections. A diversified collection would in turn contribute to the transformational agenda of the university curriculum towards decolonization (See 1.8.2).

The epistemological challenge remains an invisible obstacle to the transformation of the university establishment. However, such a transformation will not occur unless the traditional core areas of the academic library such as knowledge organisation, storage and distribution are directly linked to related processes of knowledge production, application and use within the wider context of the knowledge system. A linkage of these interrelated processes would assist South African universities, universities of technology and their libraries to focus attention on the nature of knowledge contained in the teaching and learning materials. It is the content that is organised, stored and distributed by academic libraries to students and university staff daily that deserves scholarly attention. Until such time as a decisive about turn is made in the current approach to the knowledge society as discussed in previous sections, it would be very difficult to pin down the kind of knowledge society South Africa envisages. This would make it even more difficult for librarians and fellow information professionals in LIS to make a connection between a knowledge society and the knowledge system that shapes contemporary societies.

The next sections evaluate a set of models as a possible way forward.

4.8 Evaluated models

This section evaluates a set of models (from specific to broad) used by researchers in various disciplines to understand changes taking place in academic libraries, higher education and society's knowledge system, both locally and internationally. The models are tested using a self-developed list of criteria below to determine which one is suitable to assist respond to the character of TUT's libraries and their challenges.

4.9 Criteria for selection of model

According to Schafer, (1983) "…the manner in which the social forming of theories is exercised has shifted from linguistic patterns and metaphors to the perception of what constitutes a scientific problem and the establishment of criteria for solving them…'". A self-developed set of criteria has been created as a guideline that will inform the proposed model in Chapter Seven.

According to Paterson (2017), a strong relationship between the government and academia can assist in thwarting the derailment of national policies by foreign donors. The assertion made by German social scientists, Susanne Koch and Peter Weingart in Paterson (2017) on the influential role played by foreign donors on national policy regimes has relevance for this study. As highlighted in Chapter One (see 1.8), epistemic communities drive national policy regimes. For example, they can be crucial in creating conditions for the inclusion of local epistemologies in the university curriculum. The criteria corroborate the emphasis placed on universities and their libraries as critical partners in building the sovereignty of a country. Emphasis on the important role played by epistemic communities within universities and their libraries is necessary for an ideal South African knowledge society. The following list is not meant to be exhaustive but to assist in selecting a suitable model:

- Introduce the Library Project to TUT transformation agenda.
- Position academia as a leader in innovation.
- Assist in understanding the history of the structural reforms in higher education, especially with regards to universities of technology.
- Relevance to identifiable academic library activity affected by change.
- Affirm the role management must play in dealing with change.

- Allow academic libraries to re-consider non-traditional processes such as knowledge production, application or use.
- Be realistic and flexible to adapt to smaller academic libraries.
- Acknowledge academic libraries as diverse cultural organisations within a broader societal context.
- Advocate for the sustainable development of academic libraries taking into consideration the United Nations Millennium Sustainable Development Goals.
- Identify technological advancements as the main drivers of change.
- Must espouse a learner/user centred approach.
- Amplify the role of the academic library in research and scholarly communication.
- Emphasise skills development and lifelong learning of the academic library workforce.
- Corroborate the notion of business development within higher education in partnership with indigenous African communities.

The criteria were put together taking into consideration current challenges faced by TUT and its libraries. Its intention is to assist in creating an adapted/refined model that could be useful for framing TUT's libraries policy going forward. The proposed model follows in Chapter Seven.

4.10 Models for academic library activities

Academic libraries are experiencing change at unprecedented levels. Rapid changes in information technology affect all areas of academic libraries, from acquisitions to cataloguing, research and online learning (Yi, 2016). In order to deal with change and meet the needs of students, academic library staff may be aware of the influence of Information and Communications Technologies. The following sections look into models used to deal with library activities affected by change and which have a connection with the academic library activities discussed in Chapter Two.

4.10.1 Online Journals: Access and delivery models

This model is designed to assist academic libraries to deliver online and electronic journals to their users for better access. According to Dongardive (2013), online journals are

interchangeably referred to as electronic journals but not every electronic journal is an online journal. The author argued a homogenous typology is being used in the context of scholarly communication between faculties and researchers, but the concept of online journals is not homogenous.

4.10.2 Convergence of academic libraries with IT departments

The model posits that academic libraries are better off when they work closely with Information Technology departments in universities. Its main goal is to encourage technicians to provide libraries with the technical skills and know-how to operate its computerized systems and processes. Joint (2011: 638) indicates that the notion of convergence has received widespread attention. This is evident in the vast literature written on the subject. Joint (2011) further reports that convergence has been two pronged around the world, with some universities having embraced the idea whole-heartedly and some not.

Two approaches were put forward as possible solutions to managing such change. One is to have the library as an essential client of the IT department, where the library tells the IT department how it would like to manage issues of secure access, for instance, and then allows the IT department to deliver on the model; or the converged approach in which the process of secure access is adopted by a unified information service. Joint (2011: 540) argues that the first approach is disempowering to the library and its staff and rather approves of the second approach where shared responsibility between the IT department and the library defines the convergence model. A similar model to this has already been introduced at TUT. For instance, Agyei (2007) indicates that the LIS has a working relationship with the Directorate of Teaching and Learning with Technology (TLT) and Information, Communication and Technology (ICT) Services.

4.10.3 The Self-service model

The self-service model encourages organisations to allow their clientele to serve themselves without being assisted by intermediaries. More and more organisations across different sectors in society are embracing self-service as part of their repositioning strategy. As technology advances in society, self-service has also reached the library world. This is evident

in most library conferences (Sigwald, 2016: 454). Sigwald (2016) further asserts that self-service has developed into a standard form of service in the commercial, retail and government sectors. The subject of self-service for clientele does not only incorporate literature from library science but from the retail world as well. The banking sector is a leader in self-service. Although most academic libraries in South Africa have embraced self-service as a model, many are still lagging behind in certain activities of the library. For instance, at University of South Africa (UNISA) libraries, patrons can borrow and return library material using the Radio Frequency Identification (RFID) machine without mediation from the librarian. But what exactly is self-service?

Meuter *et al* (2000) in Alcock and Millard (2007) define self-service as any technological mediated interaction or transaction with a company where the only humans involved in the experience are the customers themselves. According to Alcock and Millard (2007: 314) common self-service technologies can range from the internet, through to interactive voice technologies and public kiosks. Among the benefits listed by Alcock and Millard (2007), reduction of costs appeared to be the more prominent. Other benefits include speed of delivery, precision and customization, increased productivity, improved competitiveness and increased market share, the ability to deliver services 24/7, increased customer satisfaction and customer loyalty.

As corroborated by Alcock and Millard (2007: 313) and others, self-service can have negative effects on an organisation if not implemented properly. The authors posit that although automated self-service is a major driver for businesses today, success stories appeared to be limited to domains that use simple interaction and a simple process that is understood by users. The authors cited examples such as Google and its natural keyword search features. It was cautioned that the success of Google is mostly attributed to its PageRank algorithm and not keyword searching.

4.10.4 From closed to open topic models for classification

The open topic model argues that traditional classification systems are too inward looking to respond to a changing digital environment that is more and more socially distributed. It is

argued that traditional classification systems need to integrate social semantics into their clustering of digital knowledge. Institutional repositories form part of the modern university and academic library's digital spheres. Due to the technological changes taking place in society, classification systems are under tremendous pressure to adapt. The emergence of digital libraries within universities calls for the document clustering methods and approaches of the DDC to be transferred to the area of digital libraries (Mehler and Waltinger, 2009: 521).

4.10.5 The Instructor-Student model

The model provides for the traditional classroom arrangement where the "instructor" has a duty to teach the "student" using a top down approach. Universities and universities of technology have used this model for many years. Baglier and Caswel (2016) argue for the reconceptualization of traditional descriptions of an academic classroom wherein technological apparatus is outdated, cramped space hinders mobility and there is a traditional layout providing rows of tables bolted to the floor facing an instructor podium.

4.11 Models for the Higher Education landscape

As part of the higher education system located in universities, the introduction of new legislation by government leads to new models of structural reform. New models culminate in new frameworks for funding in the areas of student enrolment and research output. These areas of focus all affect how universities and their libraries are managed. The following sections look at models used in higher education, both locally and internationally.

4.11.1 Model of global practice-oriented learning

Global practice-oriented learning was developed in Australia and refers to the rearrangement of university structures through merging. The intention is to respond to a global shift in higher education that prioritizes science and technology transfer as crucial for national development. The Australasian styled model of global practice-oriented learning has utility for the aim of the study since it was adopted by South African universities as highlighted by Van Zijl *et al* (2006:159), hence its inclusion here. The new TUT was also established using this model.

Australia appears to be a South African destination of choice in terms of the adoption of developmental ideas and models. The ICL model proposed by the Heher Commission of Inquiry into Higher Education and Training discussed in Chapter Three (see 3.1.2) is also said to have been tested for success in countries such as Australia.

The University of Technology Sydney's (UTS) model of global practice-oriented learning is made possible by strong research performance and a leading reputation for engagement with industry and professions. With a total enrolment of over 40 000 students, UTS is one of the largest universities in Australia (University of Technology Sydney, 2016). From the discussion, we can infer that the strong research performance standards set by University of Sydney may be a great example for TUT. The division of government budget between grant categories puts research output grants at twelve (12%) percent in the period 2004/05 and 2006/07 (Ministry of Education, 2004) (RSA, 2004). Empirical evidence shows that TUT has performed fairly well in terms of research output but could do even better compared to other universities of technology. For instance, the report on the evaluation of the 2015 universities research output indicated there was a three (3%) percent increase in journal publications output in international journals between 2014 and 2015 (Department of Higher Education and Training, 2015) (RSA, 2015). TUT's libraries could also take part in knowledge production activities to assist with improving on the research output of the university.

4.11.2 The micro-campus model for higher education

The micro-campus model was developed in the US to encourage western national universities to export their education system to other countries through collaboration and partnership with professionals and universities. It relies on Information and Communication Technologies (ICTs) for operation. Universities in the US have attempted to internationalise their courses to students based in other countries. However, the cost of US education and a limited number of scholarships offered prevent students in developing countries from enrolling. Only a small global elite with the financial means are able to access US higher education (White, 2017).

As a response to this challenge, the University of Arizona (UA) has developed the micro-campus model for transnational education. As a global network of micro-campuses, UA uses

technology to deliver cutting edge education to students wherever they are in the world while maintaining an in-class, campus experience.

Micro-campuses offer a holistic, multi-layered model for sustainable international education and collaboration between universities (White, 2017). Countries such as China also have mega-projects designed to internationalise their higher education system. For instance, Montgomery (2017) reports that Peking University in China will spend £9 million (US$11.7 million) on opening a business school in Oxford in the United Kingdom. The micro-campus model may assist TUT with teaching and learning partnerships with international institutions of higher learning. Such partnerships would also allow TUT's libraries to learn from the experiences of the university.

4.11.3 A model for branding of higher education in South Africa

The model provides guidelines for higher education institutions to follow based on local and international experiences. Experience economy, relevance and external branding were identified as the three pillars of the model. In a study that highlights branding challenges faced by universities and universities of technology as well as colleges, Hay and Van Gensen (2008) propose a model of branding for higher institutions in South Africa. According to Hay and Van Gensen (2008: 81-83), experience economy cannot be meaningful without the role played by human resources. It is argued that branding starts from the inside out and staff behaviour with brand values needs to be aligned as a very important aspect of internal branding. Relevance has more to do with staying relevant in a changing external environment. Institutions have to comply with various models of society's knowledge system and initiatives that have set the tone for transformation, especially when taking the entrepreneurial route. In order to stay relevant, South African institutions of higher learning may become more entrepreneurial. This would assist institutions of higher learning to be more conscious of the social wellness of the community in order to address the social injustices of the past (Hay and Van Gensen, 2008: 94).

4.12 Models depicting changes in knowledge systems of contemporary societies

In the book *The New Production of Knowledge: the dynamics of science and research in contemporary societies* Gibbons *et al* (1994) explore the changes that are taking place in the knowledge system of contemporary societies. The book discusses the emergence of a model Gibbons *et al* (1994) refers to as "mode 2". "Mode 2" is viewed as evolving from the traditional "mode 1" model. The emergence of new models results from a shift in the nature of economies around the world and the birth of a new society wherein the terms "post-industrial", "knowledge economy", "information society" have started taking centre stage among decision makers. According to Graham and Dickinson (2007) the central feature in the newly born society is knowledge, particularly technical knowledge in domains of economic development, public policy making and professional practice.

Dick (1982: 17) reiterates that most of the focus on knowledge in a new post-industrial society is specialized systematic bodies of knowledge such as the academic disciplines and professions. Libraries concern themselves with this type of knowledge. As the appetite for technical specialized knowledge grows, researchers outside traditional knowledge production spaces such as universities begin to realise the need for specialized technical knowledge is increasing even amid challenges of inaccessibility. Much of the research in the second half of the 20th century reveals that researchers became aware that access to specialized technical knowledge was a challenge, the knowledge that was accessible was irrelevant to their problem solving intentions (Graham and Dickinson, 2007: 2372). The result was the emergence of new models as society's knowledge system began to change. Graham and Dickinson (2007) further highlight that the second half of the 20th century saw the emergence of three popular models used frequently by researchers to frame challenges across various disciplines: Mode 2, Triple-Helix, and Post Normal Science. In addition to these popular models, this study goes further to evaluate others such as Finalization Science, Innovation Systems and Academic Capitalism.

4.12.1 Mode 1

According to Gibbons *et al* (1994), Mode 1 knowledge takes place within a strictly controlled environment such as a university where established norms and values are used by a group of

experts to decide which scientific problems warrant investigation. In Mode 1, the peer review mechanism is used to decide which research output is suitable for publication. A reward system is used to elevate scholars and researchers to higher positions based on their publishing credentials. The model referred to as Mode 1 can be traced from the manner in which universities organise and diffuse knowledge to be put into use through cognitive and social norms. It is important to point out that these cognitive and social norms are laid out by the people who produce the knowledge, in this case professionals embedded within universities. This point is also highlighted by Dick (1982:19) in the following quotation:

> knowledge is organized into bodies of knowledge for example Newtonian physics, mathematical logic or information science…that such bodies of knowledge are structured through cognitive activity and embedded in finite social domains.

As noted by Graham and Dickinson (2007) in section 4.4, such specialized, technical knowledge is often difficult to access by the rest of society for solution giving. Cognitive and social norms of universities determine what shall count as significant problems and who shall be allowed to practice science and what constitutes good science (Gibbons *et al*, 1994: 3).

Economic and political changes outside the confinement of universities have prompted the emergence of other models such as Mode 2. As Gibbons *et al* (1994) highlight in their book, questions could be raised around whether Mode 1 is different to require the use of a new label or whether it can be viewed as a development that can be accommodated within existing practices. This point was reiterated by Etzkowitz and Leydesdorff (2000: 116) regarding the nature of Mode 1, to which they claim, “Mode 1 is a construct, built upon the material base of science (i.e. Mode 2) in order to justify autonomy for science during the earliest days when a university was a fragile institution and needed all the help it could get”.

An example given was its early formation in the US during the 19th century when the private industry invested money to start new universities. In order to manage concerns of earlier science communities, physicist Henry Rowland, who was director of the American Association for the Advancement of Science at the time, coined the idea of pure science. A decade later, Merton strengthened the ideology of pure science by developing a normative structure for

its institutional management (Etzkowitz and Leydesdorff, 2000). The ideology of pure science and the normative structure remained as it was throughout the centuries until the introduction of practical research during World War II as a result of the Bush Report of 1945.

4.12.2 Mode 2

Mode 2 refers to the diffusion of knowledge through society as a result of researchers and scholars' realizing institutionalized Mode 1 knowledge was neither available nor accessible to the rest of society. The need for scientific knowledge to solve social problems results in disruptive behaviour and collaboration between researchers and scholars across various disciplines on a project to project basis. Mode 2 is not new and represents the original format of science before its academic institutionalization in the 19th century (Etzkowitz and Leydesdorff, 2000). In summarizing the attributes, Gibbons *et al* (1994) highlights that Mode 1 is strictly disciplinary while Mode 2 is trans-disciplinary.

While Mode 1 is characterized by homogeneity, Mode 2 is heterogeneous. Organisationally, Mode 1 is hierarchical and tends to preserve its original form while Mode 2 is hierarchical and transient. In terms of quality control, Mode 1 uses peer review while Mode 2 employs a different type of quality control. According to Etskowitz and Leydesdorff (2000), the mechanism for distributing government funding for research had already been revised with peer review having been introduced between the 1920's and 1930's, that is, between the draft report of the Bush report and its final report. Peer review is still being used today by many academic research journals operating within the structures of institutions across the world and in South Africa. One example that comes to mind in Library and Information Science is *Mousaion* linked to the University of South Africa through its peer review committee. However, peer review today is no longer acceptable to many researchers, especially as the sole basis for the distribution of public research funds (Etzkowitz and Leydesdorff, 2000: 117).

With the emergence of Mode 2 and other models of society's knowledge system, the distribution of funding to regions and institutes that were historically perceived to be non-scientific communities is gaining momentum. For instance, Etzkowitz and Leydesdorff (2000) cite funded research collaboration between Colombia University with a lobbyist firm in

Washington DC as one example of the disregard for the peer review tradition and the appropriation of on-time funding to persons or institutes with little or no previous research experience. In South Africa, the Arts and Culture Trust also has on-time research funding for professional development programmes which can be distributed to regions and persons or organisations historically perceived to be non-scientific to conduct scientific research.

As Gibbons *et al* (1994) notes, it cannot be said that such regions, persons or organisations do not necessarily practice the norms of the scientific community. The attribute of being socially accountable and reflexive in Mode 2 is important to note here. Collaboration between knowledge practitioners and researchers includes a wider more temporary and heterogeneous set of practitioners collaborating on a problem defined in a specific and localized context.

A closer look at the aforementioned attributes points to evidence that even disciplines such as Library Science for instance, have long been influenced by economic and social changes. Today the discipline has grown to become Information Science. Authors Birger Hjørland (2011) and Marcia Bates (2008) provide information professionals with important debates around emerging definitions of information as a core concept in information science. Similar to historical debates between Hjørland and Bates in information science, Gibbons' (1994) argument that the Mode 2 model allows for research to be carried out in the "context of application" is worth noting. According to Gibbons *et al* (1994), the context of application means that knowledge results from an aspect of negotiation and will not be produced until the interests of various role players are included. While collaboration could have far reaching consequences in terms of possible competition between various actors, the challenge lies in how governments manage collaboration and competition to their national advantage. Gibbons *et al* (1994: 15) further advise:

> As with scientists and technologists, governments, too, need to learn to operate in the context of application, and increasingly this involves supranational institutions. These have political, social and economic dimensions in the cases of the EU in Western Europe, but more narrowly economic aims in the case of the North American Free Trade Agreement (NAFTA) and the General Agreement on Tarriffs and Trade (GATT).

It is clear from the quotation above that the relationship between the state, industry and academia should not only be symbolic but be informed by scientific problem solving. It is also important to add the case of the Brazil Russia China South Africa (BRICS) bloc to the list of supranational institutions mentioned in the quotation. Broadly, Western Europe perspectives on trade as represented by the EU are seriously being challenged by emerging markets in rapidly developing economies of the BRICS bloc. It is becoming increasingly hard to ignore the influence of the BRICS bloc in the global economic regime. On a narrower scale, the economic aims of NAFTA and GATT are also likely to be met with resistance as the BRICS bloc gains momentum in its aims.

Graham and Dickinson (2007: 2373) point out that the rise of knowledge brokers, reforms to research funding procedures and efforts to hold researchers socially accountable through external monitoring, management and performance assessment as well as the use of contracts rather than research grants, are evidence of collaboration and negotiation as trends that follow the emergence of new models of society's knowledge system. The knowledge system concept as introduced by Holzner and Marx (1979) is useful in that it encourages LIS researchers to view the processes of knowledge production, organisation, storage, retrieval, transfer and application as interrelated thereby linking society at large with society's knowledge system. Information professionals in academic libraries could also benefit from viewing the above processes as interrelated rather than separated.

4.12.3 Triple-Helix

The Triple Helix model argues that the university may take a lead in innovation by rejecting the firm as leader. It encourages institutional re-arrangement between the university, state and industry through a complex network of constant communications based on expectations (i.e. profit). The model was first introduced by Etzkowitz and Leydesdorff (1995, 1997 and 2000). According to the authors, the Triple Helix thesis states that the university can play an enhanced role in innovation in increasingly knowledge-based societies.

Contrary to the National Innovation Systems approach (see also 4.12.5), Triple-Helix focuses on the network overlay of communications and expectations that reshape the institutional arrangement among universities, industries and government agencies. Triple-Helix is more complex than the mutual interactions between the "double helices" on which it rests (Leydesdorff, 2000). In referring to their earlier work, (Etzkowitz and Leydesdorff, 1997), the authors indicate that the transformations taking place in contemporary societies across the world have become a centre of debate around the appropriate role the university ought to play in technology and knowledge transfer. This is in lieu of the realization that in contemporary societies, the role of the military has decreased and academia has risen in the institutional structures of contemporary societies thus transforming the network of relationships among academia, industry and government.

There seemed to be a renewed interest among students interested in the system of knowledge production in universities as deserving of attention after being left out of major government policies centred on industrial innovation (Godin and Gingras, 2000: 273).

It is interesting to note how Etzkowitz and Leydesdorff (2000) define the configurations of the model. It is argued that the model has three configurations: Triple-Helix I, II and III. Triple-Helix I takes the shape of a nation state that directs existing activities of academia and industry. In the Triple-Helix II configuration, the state, academia and industry are said to exist separately with strong borders. In Triple-Helix III, knowledge infrastructure overlaps institutional sphere and hybrid organisations occur on each overlap. Tri-lateral networks and hybrid organisations exist to solve social and economic crises. Triple-Helix as a model is indeed complex and the overlay of communication and expectation within the network level can differ in dynamics from region to region, especially considering the difference between cultural and biological evolutions of individual nations.

It is generally acknowledged that systems based on the model can be expected to be continuously in transition, that the observations provide an opportunity to update the analytical expectation (Etzkowitz and Leydesdorff, 2000).

Globalization pressures on local governments are a reality that cannot be escaped and collaboration beyond national borders will require a lot of ingenuity. Ingenuity on the part of governments and other stakeholders is required because sooner or later collaboration must turn into competition. This is the nature of the wealth creating process as it is presently constituted (Gibbons *et al*, 1994: 15). The ability to adapt national innovation systems to a rapidly changing economic and social environment requires that the arrangement between government, industry and academia no longer needs to be conceptualized exclusively between national governments and specific industrial sectors. Strategic alliances acting on a regional and international level as in the case of the European Union (EU), North American Free Trade Agreement (NAFTA), the General Agreement on Tariffs and Trade (GATT) also need to be considered.

As Gibbons *et al* (1994) observe, the key question is how nations position themselves in that kind of arrangement, especially since Triple-Helix provides the level of social structure for the explanation of Mode 2 and its relation to Mode 1 (see 4.12.1 and 4.12.2).

Other implications of the Triple-Helix are that the driving force of the interactions of the model can be specified as the expectation for profit albeit profit means different things to different role players. The foundation of the model in terms of expectations leaves room for uncertainties and chance processes. As a result, the expansion of the higher education and academic research sector can provide society with a realm in which different representatives can be entertained and recombined in a systematic manner. Knowledge intensive economies can no longer be based on simple measures of profit, utility functions need to be matched with opportunity structures.

The rise and growth of scientific papers published on academic spin off as a form of technology transfer indicate the many opportunities being explored (Grasmik, 2016: 127). This would mean that any tensions arising out of theoretical perspectives of, for instance, Mode 1, Mode 2 and Triple-Helix; need to be resolved as the dynamics feed off each other. The question around exchange media and economic expectation in terms of profit and growth, theoretical expectations, assessment of what can be realized from role players in

different regions, with their constraints, have to be related and converted into one another (Etzkowitz and Leydesdorff, 2000: 118-120).

4.12.4 Post-Normal Science (PNS)

The post-normal science school of thought posits that the practice of science may be expanded beyond the institutional boundaries of the university for the democratization of science. There is a general agreement among revellers of this theory that the expansion of science in post-modern society shall foster dialogue among scientific and non-scientific communities to solve pressing environmental issues. The foundational document for the theory of PNS was introduced by Funtowicz and Ravetz. The authors proposed a methodology that is in contrast with the notion of "normal science" by Kuhn (Graham and Dickinson, 2007: 2374).

Similar to Mode 2, PNS evolved out of the constant referral of the term "post-modern" in contemporary society. According to Funtowicz and Ravetz (1993: 740), the post-modern phenomenon can be seen in one sense as a response to the collapse of "normality" as the norm for science and culture. The term post-normal was proposed as an alternative to post-modernity in lieu of a need to extend the model for scientific argument from formalized deduction to an interaction dialogue. Most importantly, its major contribution is the provision of guidance for the choice of problem solving strategies.

In championing the theory, Funtowicz and Ravetz (1993) envisage that public knowledge and values may be considered in scientific policy formulation to avoid the uncertainties that come with the "normal science" approach which has been used for decades. In contrast to Mode 1, where traditional "pure" and "basic" research is curiosity motivated; PNS adopts a new scientific methodology around problems of quality assurance of scientific information in which the traditional peer review mechanism is "extended" to the raw natural world in which all ways of knowing are considered without prejudice. The methodology of PNS connects with views on "africanization of the university" and "africanization of the curriculum" as well as the inclusion of local epistemologies in universities discussed in section 3.1.5, 3.1.6 and 3.1.7.

It is recognised that since the formulation of policy around issues of risk and environmental well-being affect everyone, including both scientific and non-scientific communities and their cultural and biological differences, the democratization of science would take effect. Even Etzkowitz and Leydesdorff (2000: 12) highlight the dynamics of models of society's knowledge system in contemporary societies can differ from region to region given differences between cultural and biological evolutions. The rejection of the domination of the scientific method over all other ways of knowing in PNS exists to circumvent the weaknesses of, for instance, the position of Mode 1.

According to Funtowicz and Ravetz (1993: 741), "common sense experience and inherited skills of making and living have lost their claims to authority. There has been a universal assumption, (however superficial and laced with cynicism), that scientific expertise is the crucial component of decision making, whether concerning nature or society". This rings true of some of humanity's most horrible tragedies resulting from poor policy decision making when it comes to how human beings relate with nature. If policy decision making that uses the "normal science" approach was all perfect, disasters such as the Deep Waters Horizon Oil Spill also referred to as the British Petroleum (BP) Oil spill in the Gulf of Mexico in April 2010 and the Fukushima Daiishi nuclear disaster could not have happened the way they did. This then legitimizes the PNS school of thought in a world where even the dominant teaching tradition in normal science is criticized for having created a universe of "unchallenged facts presented dogmatically by uncritical students" Funtowicz and Ravetz (1993: 742-743). These are some of the weaknesses inherent in the Mode 1 model. Funtowicz and Ravetz (1993) cautioned that such weaknesses result in policy dilemmas incapable of resolving themselves.

4.12.5 National Innovation Systems (NIS)

NIS theory puts the firm as the leader in innovation. Policy makers who use this theory as a philosophical outlook perceive the partnership between the state and industry as crucial for national development through innovation. Natural science subjects such as physics and mathematics are seen as more important than the social sciences in a country's innovation initiatives. Reading through the vast literature available on the NIS concept most of the sources point to Bengt-Anke Lundvall and Christopher Freeman as the foundational

originators of the concept. In an exhaustive paper entitled *National Innovation Systems – Analytical Concept and Development Tool* presented at the DRUID Tenth Anniversary Summer Conference 2005, Bengt-Anke Lundvall laid bare the origins of the concept.

It should be emphasized at the beginning of this section that the discussions to follow in the next paragraphs have relevance to the South African context since the NIS concept has influenced policy direction since the drafting of White Paper on Science and Technology in 1996. In the White Paper, the national innovation system is characterized as "a means by which a country seeks to create, acquire, diffuse and put into practice new knowledge that will help the country and its people achieve their individual and collective goals" (White Paper Science and Technology, 1996) (RSA 1996).

Lundvall (2005) reveals that the concept was developed in parallel at different places in Europe and in the US in the eighties. The broad geographical conditions under which the concept originated are evident in the many hits that appear when one searches the internet. According to Lundvall (2005), Google had 50 000 and Google Scholar about 5000 at the time he presented his paper. The NIS concept is credited to collaboration between Christopher Freeman and the IKE-group in Aalborg. Although it is also acknowledged that basic ingredients and inspiration could be found in the work of others before that (see Friedrich, 1800 in Manzini, 2012: 2).

Freeman is said to have "contributed deep understanding in innovation processes, historical insight and wisdom to the collaboration adding to earlier notions by Friedrich List; who linked the concept to the role of the state in catching up processes. The IKE-group, inspired by French structural Marxists and development economists, contributed ideas about "natural production systems and industrial complexities" where vertical interaction was crucial for performance and outcome and linked this to the analysis of international specialization.

Within the IKE-group, Esben Sloth Andersen and Gert Willumsen played key roles in developing the systemic aspects and the idea of interactive learning between users and procedures as the micro-foundations of the concept. Bent Dalum and Jan Fagerberg made

important contributions to technology and trade while Bjorn Johnson brought in perspectives from institutional economics and applied terms to innovation. Lundvall state that his starting point was the analyses of slack and diversity at the level of the firm (Lundvall, 2005: 3).

The main take away from the above paragraph on the origins of the NIS are the contributions of French structural Marxists and development economists. The analysis of the theory from the perspective of underdevelopment in developing countries was conducted by Rodrigo Arocena and Judith Sutz in a Latin American study entitled *Innovation Systems and Developing Countries*. In the section "Looking from the South", the authors raise five important points to describe the NIS theory as adopted by developing countries of Latin America.

For the purpose of this study, only the first and fifth points are taken into consideration in order to interrogate the contribution of political role players to the NIS during its earlier formation. In roman figure (i), Arocena and Sutz (2000) reiterate that the *National Innovation Systems is an "ex-post" concept,* that is, it has been created in the North, on the basis of empirical data. On the contrary, in the South it is rather an *"ex-ante"* concept, because socio-economic behaviour regarding innovation at a national level is, in fact, hardly systemic.

This puts into the spotlight the often unhelpful tradition of developing countries of the South borrowing concepts from the North without thoughtful consideration of the differences of local context in their catching up processes. Roman figure (v), highlights how the '*NSI describes situations in which conflict is present:* here conflict can be found along two dimensions: one within the national system of innovation and the other on a more general level. On a macro-social level, "internal" conflicts have to do mainly with institutional competence and with inter-institutional problems. The assertion by Arocena and Sutz (2000) around "the relative weight that entrepreneurial organisations, political power and the academia have regarding the setting of the research agendas" is pertinent to the South African context.

The latter part quotation is relevant to current policy making discourse in South Africa. One shortcoming identified by Arocena and Sutz (2000) is that not enough attention in the NIS

theory has been given to the transformation taking place in universities. This point could be further extended by asking where academic libraries feature in the transformation of universities? Evidence of continuous gross underdevelopment, even in developing countries which have embraced the concept as the basis for policy formulation, could be useful to point out the inability to evaluate the theory and its continuous revision by those who made contributions to its earlier forms. For instance, unemployment in South Africa stood at 27.7% during the Quarterly Labor Force Survey in 2017 (Statistics South Africa, 2017). This figure is worrisome considering the fact that NIS has been used as a guideline for policy positions for over twenty three years.

Manzini (2012: 2) notes that "a case is yet to be made for the appropriateness or expediency of the NSI concept as a conceptual framework for understanding and shaping the behaviour of knowledge driven institutions within a developing country". At the time of reviewing literature for this study, no study was found to have closed the research gap identified by Manzini (2012) in South Africa. Similarly, Lundvall (2005: 5) highlights the following pointers regarding the reconfiguration of NIS:

- Understanding interactive learning and knowledge calls for other disciplines than economics.
- Future research on innovation has to go into more detail referring to specific clusters, regions and technologies rather than remain at an aggregate national systems level.
- A "scientification approach" that declares the intentions to establish complete and final explanations of national innovation performance is not commendable.

A common behaviour among most "policy makers in developing countries is that they pay lip service to concepts such as the NIS while neglecting it in their practice" (Lundvall, 2005). The question is which model of society's knowledge system is most suitable for the policy direction of South Africa more generally and TUT's libraries in particular (see also 1.4.1).

4.12.6 Finalization in Science

Finalization in Science describes the process scientific disciplines in the academic professions undergo after reaching a stage of maturity. After maturity the discipline produces specialized

fields that are used to solve specific social challenges. The fundamental theoretical framework for this concept is highlighted by Schafer (1983) in a book volume consisting of essays and case studies entitled, *Finalization in Science: The Social Orientation of Scientific Progress.* The author introduced the book by indicating the contributions of a research group "Alternatives in Science".

The group worked tirelessly on the possibilities for the societal orientation of science. The group was formed at the Max Planck Institute for the Study of the Conditions of Life in the Scientific-Technical World, based at Stanberg in West Germany. Original group members were Gernot Bohme, Wolfgang van den Daele and Wolfgang Krohn and were later joined by Wolf Schafer, Raine Hohlfeld and Tilman Spengler. Schafer (1983) pointed out the initial hypothesis of the concept, which also appeared in the English version of Bohme *et al* (1973) followed by the empirical testing of its basic theoretical premises through a selection of case studies, was used to reflect on and revise the original position. The original position of Finalization in Science by Bohme *et al* (1976: 307) was theorized as follows:

> Contemporary science is characterized by specific latitude for alternative developments. This means that science is open for external (i.e. economic, social, political) purposes to become the guidelines of the development of theory…this notion must be distinguished from traditional forms of the application of theoretical results….three causes for the decline in the internal determination of the development of science are: 1. The achievement of a state of "theoretical maturity" in fundamental disciplines (e.g. physics and chemistry). 2. Partial renunciation of the demand for causal explication and transition to functionalist science (e.g. physiology). 3. The necessity of combining ecological approaches with the traditional analytical premise in different scientific disciplines. The perspective embodies a growing coincidence of theoretical aims and social norms.

Revised positions of the Finalization in Science concept offered by essays and case studies in Schafer (1983) have similarities to those discussed earlier for Mode 2 and are in contrast to the position in Mode 1 as indicated in sections 4.12.1 and 4.12.2. In is agreeing with the position of Mode 1, Schafer (1983) wrote:

> It is possible for theoretical developments themselves to be subjected to social influences and even political planning, and further; that this phenomenon of orientability is to be found at the current

> level of scientific attainment…the social orientation of present day sciences can be seen to be operative in a number of different areas, namely: 1. The selection of research problems where priorities are ordered in accordance with military, economic, welfare or other interests. 2. The definition of problems (e.g. establishment of concepts of illness and objectives in combating it). 3. Specification of explanatory ideals regarded as ideal for a given field. 4. The limiting conditions of research (i.e. boundaries beyond which further analysis of the field is not held to be of interest). Conditions follow from the specification.

Schafer (1983) made conclusive remarks by asserting that there were signs of a move towards the social steering of theoretical knowledge. The above changes are made explicit using a three phased model which highlights the phases of development in scientific disciplines, especially the "simplistic homogenous" natural sciences:

1. Exploration phase

   This is a period of development prior to the emergence of theories which serve to organise the scientific field.

2. A paradigmatic phase

   This phase follows in the footsteps of Kuhn (1976) in Schafer (1983) who argued for a 'paradigm' as a theoretical development in which progress of research is determined by the problems of theory. This phase leads to mature theories which contain a fundamental, sometimes conclusive, understanding of a discipline's research object.

3. Post-paradigmatic phase

   It consists of the bolstering of theoretical development and a shift towards the pursuit of social goals.

In Part I of the book by Schafer (1983), several case studies are presented as part of the empirical data that was collected in preparation for a reflection and a revision of the original position of the Finalization in Science concept. Just to mention a few, the case studies of *Agricultural Chemistry and Cancer Research* are compared to *Fermentation Research and Fluid Mechanics.* It was argued that *Agricultural Chemistry* emerged around 1840 as one instance of finalization from the methodological maturity of organic chemistry.

Also, *Fluid Mechanics* is said to have represented another instance of finalization where the significance of aircraft construction resulted in the special development of hydrodynamics –

which were equations developing out of the original science. It is interesting to note the changes or the transitions of internal to external dynamics of scientific disciplines presented by Schafer (1983) occur in other fields as well. LIS, for instance, is not immune from such a change and transition. It could be argued the theoretical developments can lead to the different phases the discipline has gone through up until today: from Claude Shannon's "information theory", documentation, library science to information science (Hjørland, 2015).

The question around whether or not "finalization" is needed in LIS is a topic for future research, especially given the challenges faced by TUT's libraries as highlighted in Chapter Two, (see 2.1).

4.12.7 Academic Capitalism (AC)

AC explains the process of college and university integration into the "new" global knowledge or information society, which is used interchangeably as a theory of society's knowledge system with an entrepreneurial focus. AC sees faculty, students, administrators and academic professionals as role players who use a combination of resources to take advantage of new partnerships that assist higher education with the "new" economy (Slaughter and Rhoades, 2004: 1-7).

The authors' further emphasize how the 2004 publication was different from the previous book: *Academic Capitalism: Politics, Policies and the Entrepreneurial University, 1997.* The 2004 book shifts from a public good knowledge/learning regime to an academic capitalist knowledge/learning regime. According to Slaughter and Rhoades (2004), "state resources are used to enable organisations to emerge by bringing the corporate sector inside the university so as to develop new networks that intermediate between private and public and public sector... AC moves beyond the thinking of the student as a consumer to considering the institution as marketer".

A changing landscape of external economic pressures and market forces are forcing universities to think about new ways to supplement government subsidies by forming new partnerships with the corporate sector in order to create new income streams. AC emerged

within higher education in the US and was referred to as “academic capitalism”. However, the notion of “bringing the corporate sector into the university” is contentious and controversial. Without strong leadership and effective management, the notion of embracing economic values poses a risk to core traditional academic tenets of teaching and a search for knowledge. This is very interesting when considering the often strained budgets of university libraries.

In South Africa, the recent student disruptions of 2015 and 2016 highlighted in Chapter One were driven by the desire by students to have “free quality decolonized education”. University management also made reference to strained budgets due to a declining public education subsidy from government. Academic libraries also have financial constraints of their own to confront. In many instances “funding for the library, and the priority given to its operations within the overall institutional budgets, is a matter of great concern for librarians” (Hoskins and Stilwell, 2011: 51).

Even more interesting is the fact that, since the “new” knowledge or information society economy has become globalized, there are small pockets that empirically resemble the theory of AC in higher education in South Africa. For instance, Slaughter and Rhoades (2004: 2) highlight how universities and colleges which use the AC model negotiate with external corporations on behalf of students and student bodies for resources through contracts such as sports contracts, test beds and direct marketing. Once students graduate, they are “traded off” by branding them as alumni and potential donors. Some elements of AC are common in South African universities. The notion of “captive markets” is clearly visible when one walks through malls and streets in cities such as Johannesburg and Pretoria. Students can be seen wearing clothing that displays university and college trademarked symbols, images and names.

Since AC as a theory has been mostly concentrated in the natural sciences (see Missyplicity project at Texas A & M University, USA in Slaughter and Rhoades, 2004), it remains to be seen how effective AC in both the natural and social sciences would be in South African Universities. Such research is not included in this study.

In this section, the focus is on whether AC or any of the models already discussed in earlier sections, could be used to frame TUT's libraries policy going forward. If it is true "market and market like activities are no longer confined to the natural sciences and engineering, they permeate higher learning" (Slaughter and Rhoades, 2004: 5), how then are the social sciences, such as LIS, coping within the "new" knowledge or information society economy? How can mechanisms of AC such as patenting, copyright, trademarks, intellectual property and extended managerial capacity, part-time faculty and information technology be of help to challenges faced by TUT's libraries?

In another study of US universities, Bullard (2007) expands on the theory of AC in a study entitled *Academic capitalism in the social sciences; Faculty responses to the entrepreneurial university*. The results of the study are summarised as:

> Academic capitalism in the social sciences is mostly about grant activity and involves no technology transfer or patenting. Grant activity is sporadic and still of great concern since it is more important to junior faculty than for senior faculty. In addition, academic capitalism in the social sciences is mostly about the marketing of ideas based on the value of positive social change and quality research, rather than economic yield.

Bullard (2007) proposes institutionalism and resource dependency theory as useful frameworks for viewing academic capitalism. Given the financial challenges faced by universities and their libraries, how can AC assist South African universities and their libraries in creating new revenue streams?

4.12.8 A model of society's knowledge system

World War II (1939-1945) was a turning point in the economy of the US. A decade and a half later, the Cold War between the US and the Soviet Union saw an exponential growth in the economy of the US. The emphasis put on research and development during and after the two wars saw the increase in the volume of specialized technical knowledge, especially in the "hard sciences" and engineering. With more resources allocated to education, and research and development, the volume of specialized technical knowledge increased. This resulted in what is referred to as the "knowledge explosion". The fall of communism as well as local

factors such as the growth of the automobile industry, the housing boom, defence spending just to mention a few, also contributed to the growth of the economy. For example, Gross National Product of goods and services grew from $200 thousand million in 1940 to $300 thousand million in 1950 to more than $500 thousand million in 1960. The post war period saw the US emerge as the richest country in the world (Eichengreen and Frankel, 1995).

Fritz Machlup's investigation of the production and distribution of knowledge in the US was a pioneering study which provided the lenses into the type of society emerging post-capitalism. This new knowledge based society became known as "postindustrial", "postcapitalist", "information society" and "knowledge society". These terms have since been exported globally and are now used by politicians, policy makers and academics across the world. Although rooted in economics, the study by Machlup (1962) laid the groundwork for further research on the main factors making up the emerging knowledge based society. Since Machlup's investigation, authors across various disciplines sought to understand and characterise the knowledge based society by identifying the processes of knowledge production, organisation and storage, distribution, application and use as key factors. These processes occur among role players who make up the knowledge system of contemporary society (see also Chapter Two) through partnerships and communication. Central to the knowledge system of contemporary society is the prevalence of universities as knowledge production centres of specialized, technical, recorded knowledge.

In characterizing the knowledge based society, Holzner and Marx (1979) proposed a sociology of knowledge based on the theory of social constructionism to highlight the manner in which knowledge production, organisation, distribution and utilization of specialized technical knowledge has transformed society into a postmodern society. For instance, they rejected the "social constructionist" school of thought of Schutz, Berger and Luckman and others. Holzner and Marx (1979) claim the notion that modern centres of knowledge production such as universities are culture neutral is not true since the ideas of the knowledge produced represent beliefs and ideologies.

Dick (1982) proposes a reality constructionist approach that perceives knowledge as socially constructed. It rejects the notion of beliefs and ideology by focusing on the social context within which knowledge is produced. According to Dick (1982), "any sociological study of librarianship may take into consideration society's knowledge system". Subsequently, he proposed a model for society's knowledge system as consisting of knowledge production, organisation and storage, distribution and access, application and use. Although the model is essential for the sociological study of librarianship, there is a need to adapt it to specific types of libraries and the South African context. In this study, the model is adapted to TUT's libraries albeit it can be adapted to any type of library. More details on the proposed model for TUT's libraries are discussed in Chapter Seven.

4.13 Summary

This chapter highlights the historical connection between academic libraries and research libraries and the value placed on knowledge production, application and use. Evidence of the existence of the knowledge system is presented across various disciplines and fields. This is followed by a substantial discussion on the knowledge society approach. It is argued that there is an absence of scholarly literature on the relationship of the knowledge society and the wider knowledge system context among librarians and researchers in library and information science. Models used in academic libraries, higher education and those used to depict the evolution of knowledge systems of modern contemporary societies are evaluated. The chapter ends with a discussion of the model of society's knowledge system, also used as a broad theoretical framework for this study. Based on the ideas of other researchers, an adapted model is proposed for South African universities and their libraries. See Chapter Seven for the proposed model.

Chapter Five: Research Methodology

Introduction

The study employs a blended methods approach that relies on a focused literature review, theoretical models and empirical evidence to inductively investigate TUT's libraries within a wider knowledge system context using a single case design.

5.1 Data collection methods

Data triangulation was employed to source data from different sources. This included a case study method, a qualitative evaluation method, and literature review across various disciplines, documents as well as data collected from participants. Henning *et al*, (2004) caution that using triangulation in a study may do more to source and interpret data in various ways than just the metaphoric definition of triangulation as calculating a position from several different vantage points.

5.1.1 Literature review

When searching through the literature, there are sporadic South African sources on the knowledge system in direct contrast to numerous sources available on academic libraries. As a result, the researcher has chosen to use older sources on the knowledge system from elsewhere in the world to supplement the seemingly hard to find new ones, especially in South Africa. Older sources are preferred because they provide for vital historical insights into the theoretical approaches of different authors on the knowledge system across various disciplines. Consulted sources, in no particular order, include those from the disciplines of sociology, psychology, economics, computer science, education, knowledge management, environmental sciences as well as Library and Information Science. Sporadic sources on the knowledge system in South Africa point to a worrying trend amongst scholars to investigate phenomena from an atomistic point of view in contrast to a holistic one, especially since academic libraries do not operate in a vacuum but are part of a larger social context also referred to as the knowledge system in society (Holzner and Marx, 1979). The investigation of the academic library using a narrower context is problematic and appears to be transdisciplinary (see Chapter Four).

5.1.2 Case study

The case study method was used to investigate TUT's libraries using available documents and additional data collected from participants. Yin (2014: 16) defines a case study as an empirical inquiry that investigates a contemporary phenomenon (the case) in depth and within this real world context, especially when the boundaries between phenomenon and context are not clearly evident. The link between TUT's libraries and the knowledge system context is often not very clear. It is the purpose of the study to illuminate on the position of TUT's libraries in society's knowledge system. According to Henning *et al* (2004: 40) case studies answer the questions who, how, why or what is the case?

5.1.3 The qualitative evaluation method

In addition, the qualitative evaluation method was used to evaluate a set of models. A self-developed set of criteria was used as a tool to test the models towards a selection of elements and features that are then used to table the proposed model in Chapter Seven. Qualitative evaluations occur when researchers design evaluation tools that they then standardize. Because the intent of a qualitative evaluation is to capture change, there has to be a baseline study followed by implementation and monitoring of evaluation and eventually an impact study (Owen and Rogers, 1998 in Henning *et al*, 2004: 47).

5.2 Data collection instruments

Apart from data collected from the literature, data from participants at TUT was collected in a survey using an electronic questionnaire. The survey was followed by a focus group and interviews. The researcher chose the use of an electronic survey questionnaire because TUT campuses are spread across four provinces. The electronic survey questionnaire relies on email addresses and it's able to reach all participants regardless of location. Also, the focus group and interviews were chosen to follow up on the electronic survey questionnaire. Participants were able to share experiences they were unable to share in the survey. In addition, the researcher, also an employee of the TUT library, relied on documentary evidence collected.

5.3 Sampling

A purposive sample of 40 participants was drawn for this study. The sample consisted of members of TUT Executive Management Committee, the Library and Information Services Directorate, Heads of Libraries, librarians and representatives of student organisations. Purposive samples are selected on the basis of the knowledge the sample possesses on a phenomenon or phenomena (Babbie, 2011: 179).

5.4 Data analysis

Quantitative and qualitative data was analysed using Statistical Package for the Social Sciences (SPSS). Histograms and frequency polygons were used to visualise quantitative data. Responses from a focus group discussion were coded, categorized into themes and then analysed for relationships and patterns using Creswell's data analysis spiral approach (Creswell, 2007). Pie charts, bar graphs and multiple bar graphs were used to visualise qualitative data.

For validity and reliability, the questions asked in the electronic survey questionnaire focused on the current context and core functions of TUT's libraries. All data collections instruments were piloted before the official data collection. Also, the sample chosen was made up of people with intuitive insight into the internal and external operations of TUT's libraries. In addition, the questions asked in the electronic survey questionnaire were followed up in a focus group and interviews. Focus groups and interviews supported and complemented each other. Moreover, the data was collected to assist with a deeper understanding of the context and functions of TUT's libraries revealed in the literature reviewed. The data collected in the survey, focus group and interviews remained the same under different conditions. This assisted the researcher to propose a model for TUT's libraries which can be used to make policy adaptations.

5.5 Ethical considerations

All research instruments and applicable documentation were submitted to the Research Ethics Committees of both TUT and University of Pretoria respectively for approval before

official data collection could take place (see Appendix 5 and 6). An informed consent document was circulated among participants to request for permission to collect data.

5.6 Summary

A blended methods approach was used to investigate TUT's libraries using a single case design. Data collection methods used include the literature review, case study and qualitative evaluation. The searcher relied on a survey to collect additional data from a purposive sample at TUT using an electronic questionnaire. The purposive sample consisted of members of Executive Management Committee, the Library and Information Services Directorate, Heads of Libraries, student organisations and community leaders. An informed consent form was circulated to all participants before additional data was collected.

Chapter Six: Data Analysis

Introduction

The analysis of data for the survey began a month after an electronic questionnaire was distributed to TUT library staff, directorate and students via email. It was not easy to collect additional data from a purposive sample at TUT. Some participants opted out of the email sent while others did not respond at all. The electronic questionnaire had twelve questions and was compiled with Qualtrics Survey Software. Questions were standard in nature (i.e. multiple, open ended, slider, rank order) as well as specialty questions (i.e. net promoter score).

Out of the initial sample of 40, 21 participants responded. There were 7 spoilt cases resulting from the inability of the survey software to display questions to some participants. An error message "this question was not displayed to the respondent" accompanied the spoilt responses. Subsequently, only 14 cases were considered for analysis. Recipients of the initial emails were spread across the libraries located at nine learning sites namely Arts Campus Library, Emalahleni Campus Library, Garankuwa Campus Library, Mbombela Campus Library, Polokwane Campus Library, Pretoria Campus Library, Soshanguwe North and South Library and the Science Campus Library. Among the fourteen initial cases recorded, only Soshanguwe North Library, Garankuwa Campus Library, Pretoria Campus Library, and Emalahleni Campus Library were represented.

Moreover, the response rate of 35% was low. To improve the low response rate a printed questionnaire was distributed to more participants. An invitation to participate in the survey was also sent to the Mbombela staff mailing list consisting of a hundred and thirty recipients. Out of a hundred and thirty recipients, only five responded. In addition, interviews were conducted with five students who are familiar with TUT's libraries not represented in the initial fourteen recorded responses. These students had lived in Limpopo province and are familiar with the TUT library in Polokwane. They have since relocated, and now study at the Mbombela Campus. As a result, Polokwane Campus Library was represented. One email with

two reminders was also sent to participants at the Durban Service Point Library. No response was received from the Durban Service Point Library. Out of the twelve learning sites where TUT's libraries are located, ten were represented. As a result of the extra efforts, thirty five responses were analysed. A final response rate of 85% was recorded. The analysis of the survey and interviews was followed by an analysis of responses from a focus group consisting of ten members of student organisations.

6.1 Quantitative data

The following responses were collected from participants during the survey. Data was analysed with the Statistical Package for the Social Sciences (SPSS).

6.1.1 Experience of TUT's libraries response to social conflict

This question asked participants to rate their experience of TUT's libraries response to social conflict affecting South African Higher Education, specifically the #Feesmustfall and #Rhodesmustfall campaigns. The following responses were given:

a. Engagement with students

   Of thirty five participants, the majority stated that the engagement of TUT's libraries with students' equalled expectations. More than 20% of participants stated that it was short of expectations and far short of expectations (See Figure 6.1). This question was followed up during interviews. Some interviewees indicated that engagement from TUT's libraries was through notices placed in and around the libraries

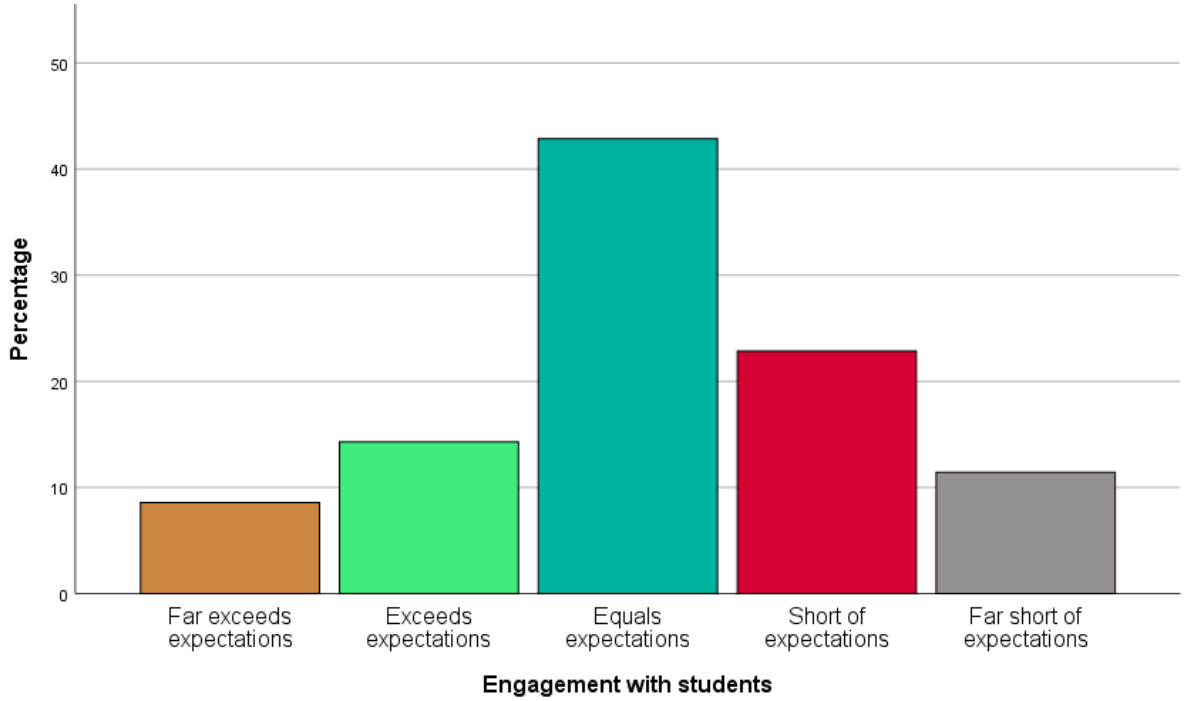


Figure 6. 1: TUT's libraries engagement with students during social conflict

Most of the notices were communication related to the closure of libraries during student disruptions. Such notices were also used at the Mbombela Campus Library where the researcher works fulltime. According to the data, the response of TUT's libraries during the 2015 and 2016 student disruptions focused more on matters relating to service provision. There was less engagement with students in debates and discussions around transformation in higher education.

b. Engagement with the general public

When asked about TUT's libraries' engagement with the general public, more than 30% of the participants said it equalled expectations. More than 20% indicated that engagement with the general public was short of expectations. It is not clear what type of communication was used to engage the public during the 2015 and 2016 student disruptions. According to the documentary evidence at the researcher's disposal, there were no documented engagements with the general public on transformation in higher education. As indicated in Chapter Two (see 2.1), annual reports of TUT's libraries are not easily accessible to the public.

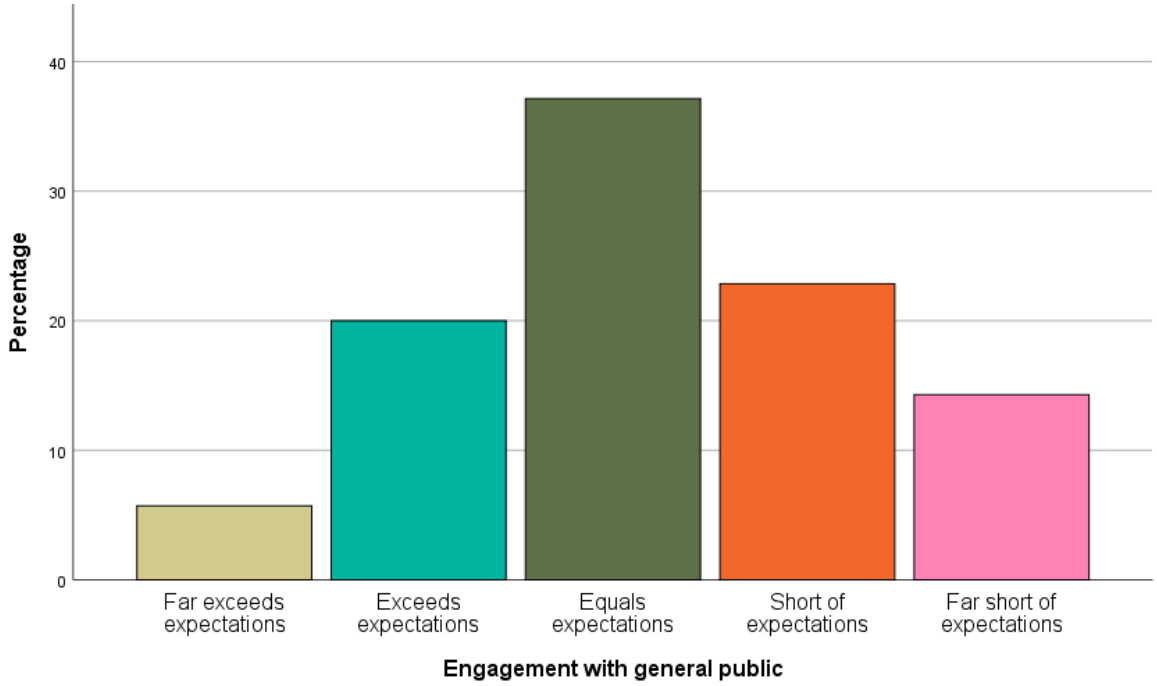


Figure 6. 2: TUT's libraries engagement with general public

c. Engagement with academic staff

Similarly, the majority of participants stated that engagement with academic staff equalled expectations (See figure 6.3).

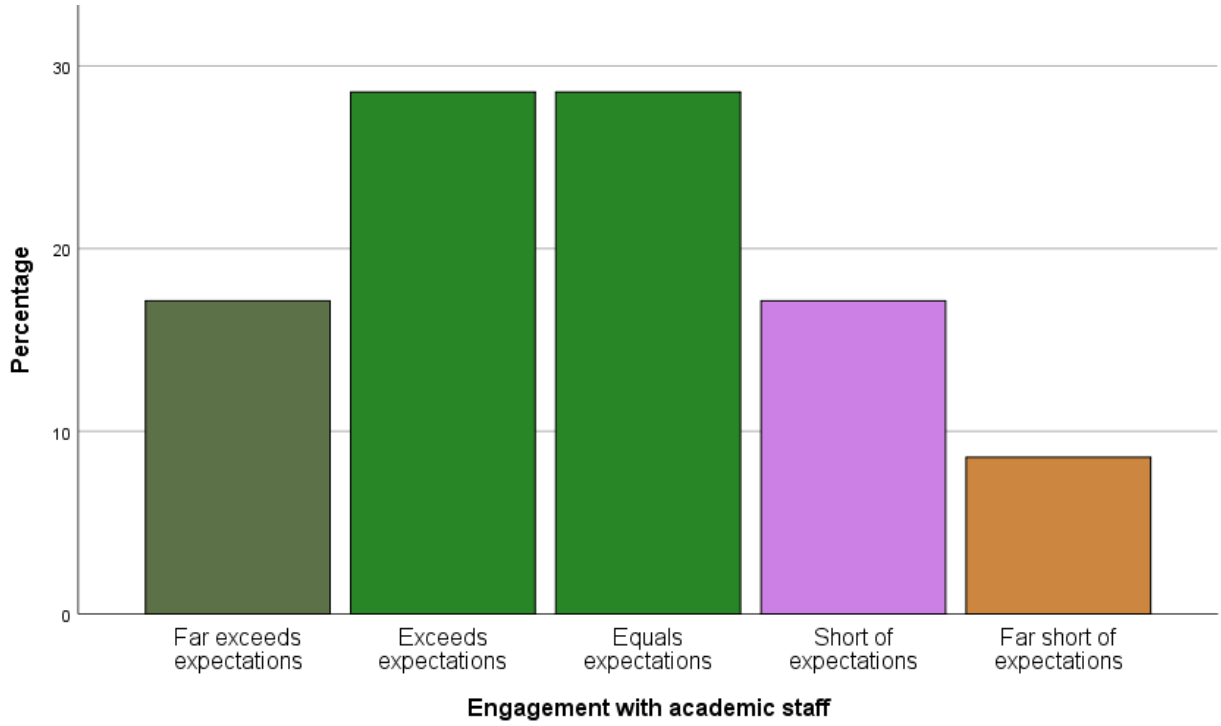


Figure 6. 3: TUT's libraries engagement with academic staff

Data for this question is interesting given the responses collected during a focus group discussion. For instance, it is not clear which communication tools TUT's libraries used to engage with students and the general public. In Chapter Two, (see 2.1) it was indicated that the researcher attempted to find annual reports of TUT's libraries but none were found. Data for the engagement with academic staff, is satisfactory since the TUT staff webmail for the different campuses is consistently used to engage staff on the operations of the university. However, the researcher did not observe any engagements of TUT's libraries with academic staff on the staff webmail, internal staff portal and similar communication platforms. A comparison with responses received during a focus group discussion with students is found in section 6.2 (analysis of qualitative data).

6.1.2 Role that TUT's libraries may play to address social conflict

When asked about the role that TUT's libraries may play to address social conflict, the majority of participants indicated they may play a supporting role to the university. There was also a considerable number of participants who did not see the role of TUT's libraries in addressing social conflict. A few participants indicated that TUT's libraries should play a leading role. This data confirms the current situation of TUT's libraries (see 2.1). Most of the libraries serve as departmental libraries for specific academic programs. As a result, there was a general perception that TUT's libraries should continue to play a supporting role to academic departments. This means that there is resistance to the involvement of matters other than supporting academic departments.

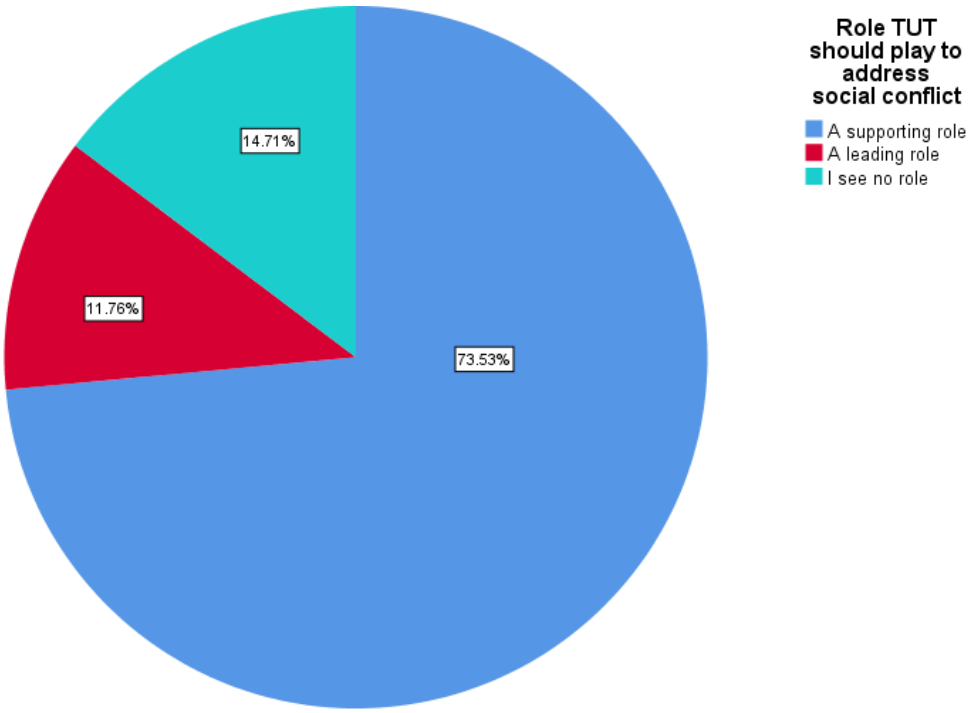


Figure 6. 4: Role that TUT's libraries should pay to address social conflict

6.1.3 The vision of TUTs Transformation Framework 2017

As indicated in Chapter Two (see 3.1), discussions about transformation at TUT have been scarce since the discussion paper on transformation was published. TUTs Transformation Framework 2017 represents a renewed interest on the issue of transformation within the university since the discussion paper on transformation was compiled in 2007. Survey participants were asked to state what percentage of TUT's libraries activities should support the ideals of the TUT Transformation Framework 2017. A score between 0-60 represents the detractors, 70-80 the passives and 90-100 the promoters of each ideal.

a. Ideal 1: Advances knowledge of all forms, including indigenous knowledge, through research

Of thirty five, the majority of participants were detractors of ideal number one. Also, a considerable number of participants were passive while a few promoted the ideal. It is not clear why ideal 1 was given a lower score than ideal 7 (see 6.1.3g) given its relevance to the discourse around "decolonization" and "africanization" of the university curriculum. Could this be linked to the data in section 6.1.2? The fact that the majority of participants indicated that TUT's libraries should play a supporting role while a

considerable number do not see any role for TUT's libraries in addressing social conflict confirm the negative response (See figure 6.4).

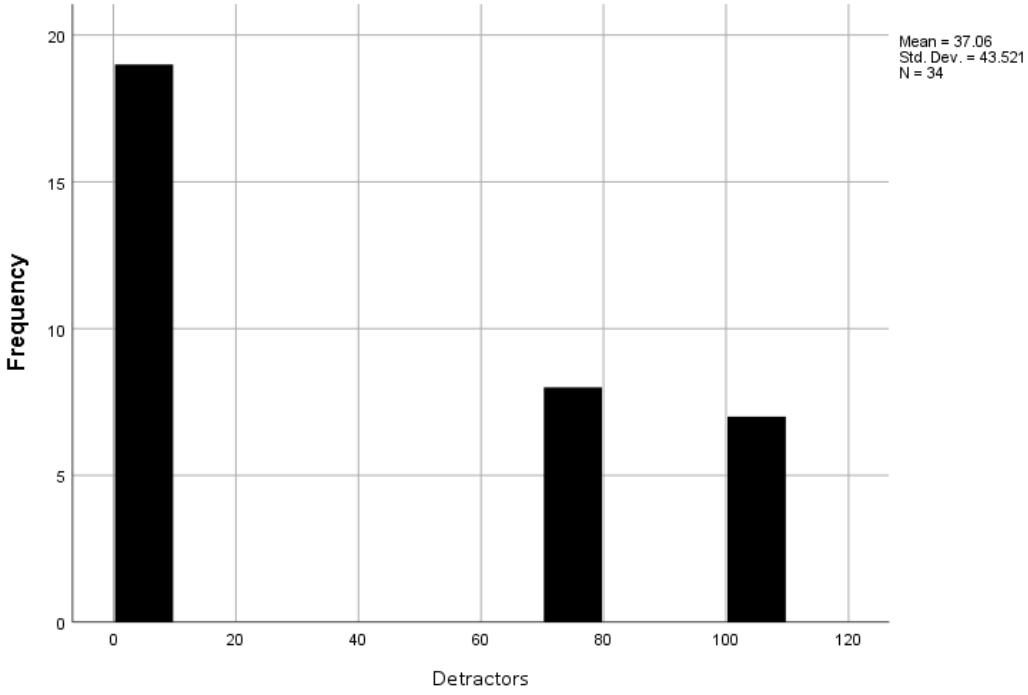


Figure 6. 5: Detractors of the support of TUT's libraries to ideal 1

b. Ideal 2: Provides quality service to students, staff, local communities and society

Of thirty five participants, the majority were passive about the support of TUT's libraries activities to ideal 2 of the TUT Transformation Framework. A considerable number of participants were detractors and a few promoters. This data also connects with the other data (see 6.1.10 and Figure 6.6).

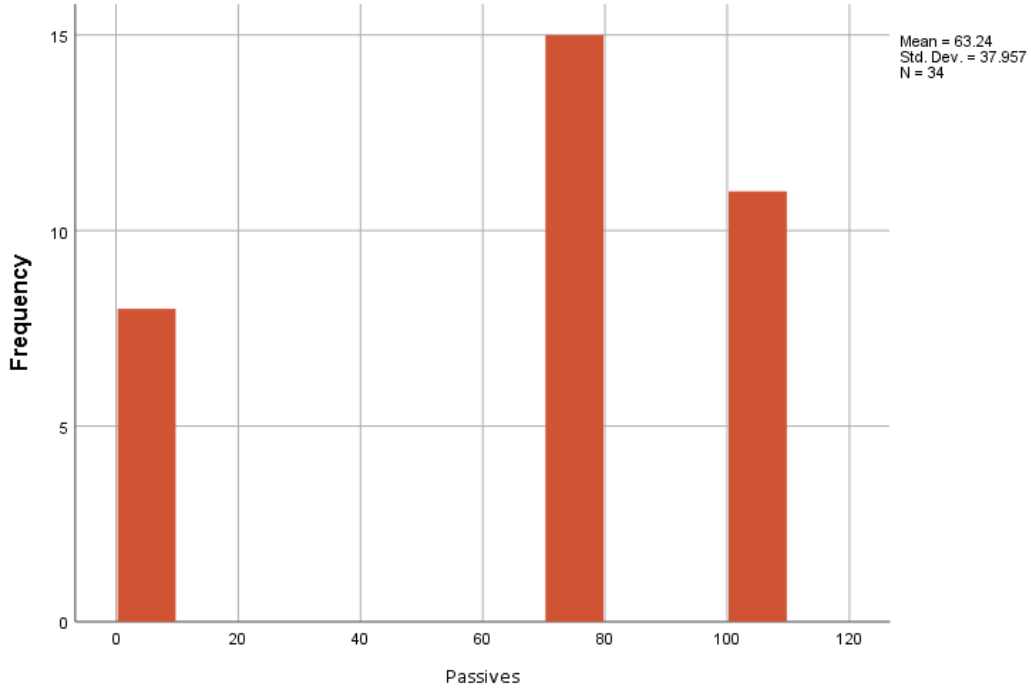


Figure 6. 6: Passives of support of TUT's libraries activities to ideal 2

c. Ideal 3: Educates well rounded students, appreciative of their culture and contribution to the good of society for 21st century challenges

The majority of participants did not promote the idea of TUT's libraries activities dedicated to ideal 3 of the TUT Transformation Framework. Also, a considerable number of participants were passive towards ideal 3. This data indicated that there was doubt about the support of TUT's libraries activities to ideal 3. This data connects with the data in Chapter Two (see 3.1). There was very little documentary evidence of TUT's response to transformation and the emergence of social conflict (i.e. fees must fall protests) prior to the publication of the TUT Transformation Framework 2017.

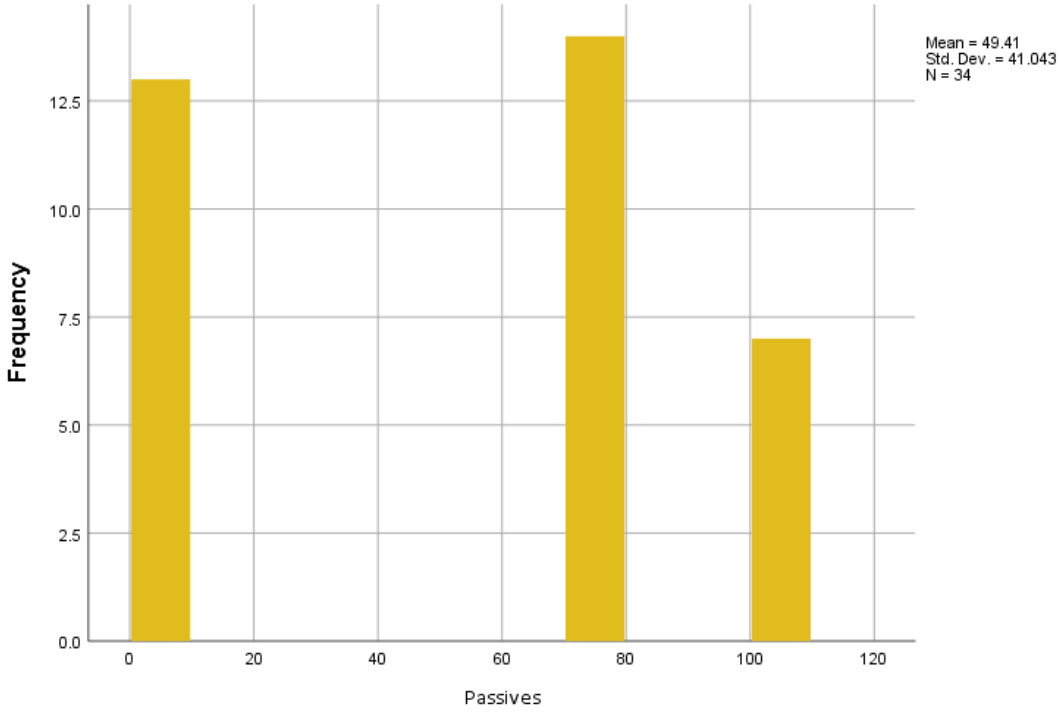


Figure 6. 7: Passives of the support of TUT's libraries activities to ideal 3

d. Ideal 4: Develops students as graduate leaders, critical citizens and agents of change

The majority of participants were both detractors and passives on the support of TUT's libraries activities to ideal 4 (see Figure 6.8). This implies that participants perceive TUT's libraries as crucial in student development. In addition, the promotion of some aspects of ideal 4 appears to be in line with the post normal science school of thought (see 4.12.4). However, this data is in conflict with the data in section 6.1.3a. The support of ideal 1 by TUT's libraries may assist to create conditions for the diversification of library collections to be reflective of the ethnic diversity of South Africa. The majority of participants were detractors of this ideal. The researcher can only speculate that participants did not see a connection because they believe there is a reluctance from TUT's libraries to advance all forms of knowledge, especially indigenous knowledge.

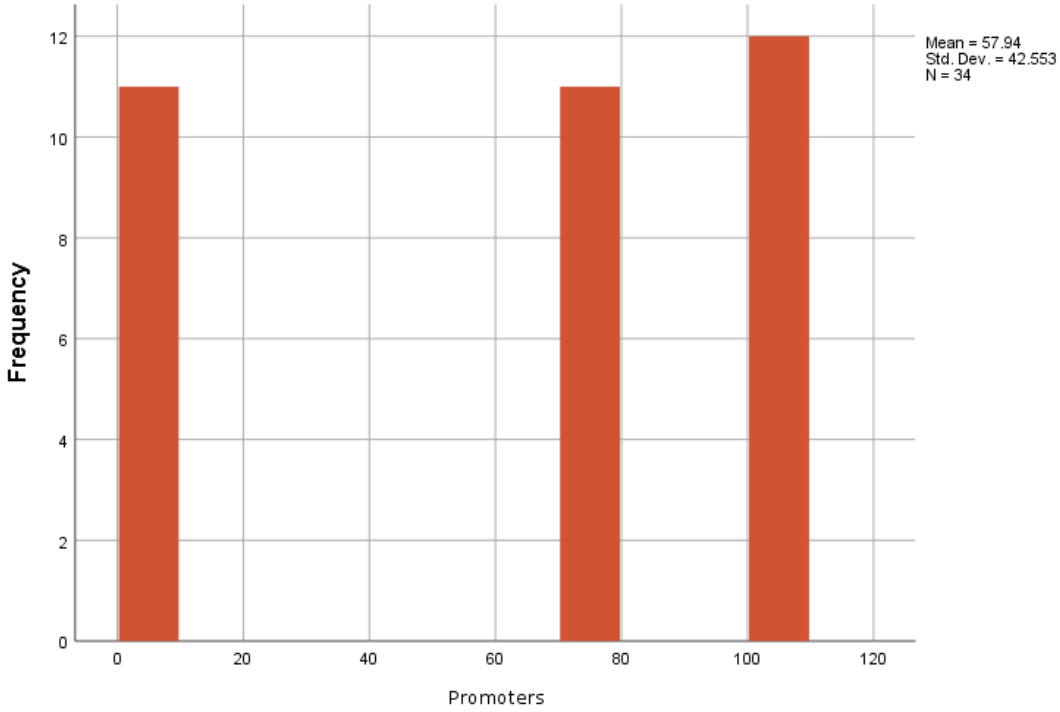


Figure 6. 8: Promoters of the support of TUT's libraries activities to ideal 4

e. Ideal 5: Fosters freedom, democracy, and social and economic justice

The majority of participants did not agree that TUT's libraries activities should support ideal 5 of the TUT Transformation Framework (see Figure 6.9). While the concepts of freedom, democracy and social and economic justice feature prominently in political speeches in South Africa, there is less rhetoric on these concepts within TUT's libraries. As indicated in Chapter One, discussions and debates about transformation in higher education are often politicized and reduced to class struggles. This could be one of the reasons why participants did not agree that TUT's libraries should support ideal 5.

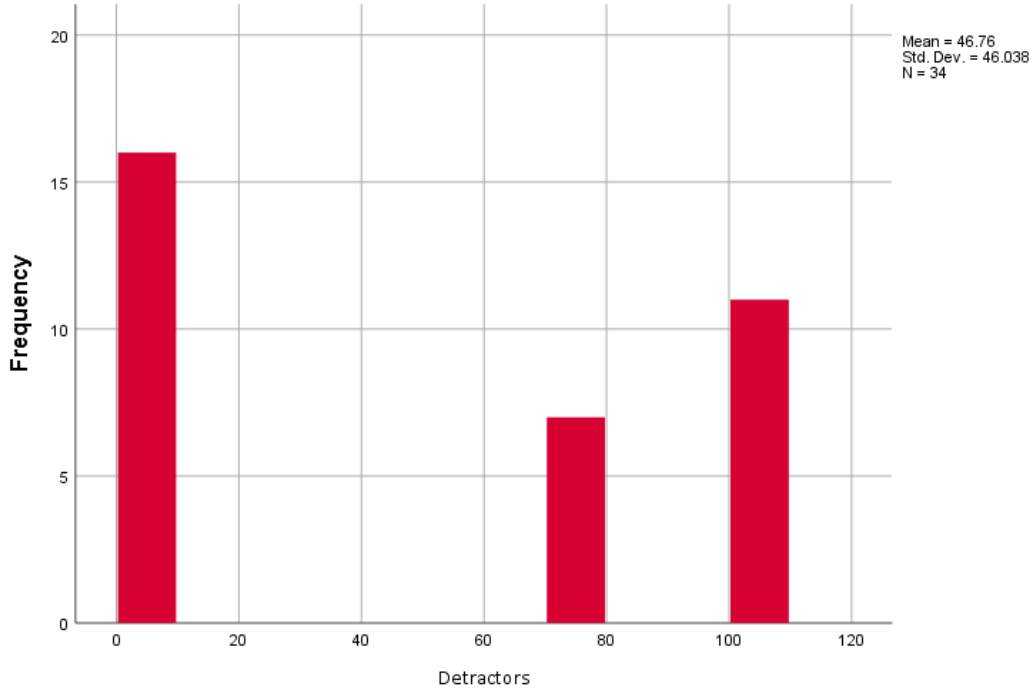


Figure 6. 9: Detractors of the support of TUT's libraries activities to ideal 5

f. Ideal 6: Strengthens identity, belonging and inclusion of staff and students

Most participants were not in favour of the support of TUT's libraries activities to ideal 6 of the TUT Transformation Framework (see Figure 6.10). Although the majority of participants were passives, a considerable number appear to promote the support of TUT's libraries to ideal 6. This data could be linked to the general perception of the lack of social cohesion among staff members. The organisational culture of associating job position with power is rife within the library and information services community. This leaves staff members such as cleaners lacking a sense of belonging within the university (Joint session of labour unions NEHAWU and NTEU, 2018). In addition, the data might indicate students are passive since there are currently very few cultural activities organised by TUT's libraries to promote this ideal.

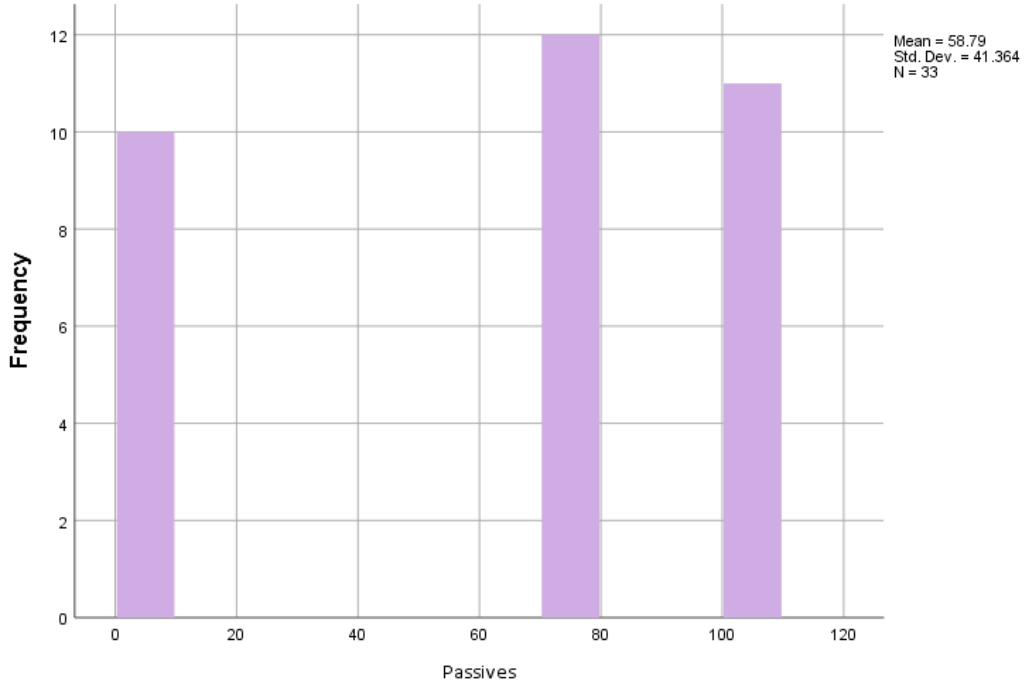


Figure 6. 10: Passives of the support of TUT's libraries activities to ideal 6

g. Ideal 7: Prioritizes gender redress and tackles discrimination in all its various forms

A majority of the participants were in favour of the dedication of TUT's libraries activities to ideal 7 (see Figure 6.11). This data might have more to do with the current political climate where gender equality dominates most of the political discussions and debates in South Africa. The researcher does not see any connection between TUT's libraries activities and this data.

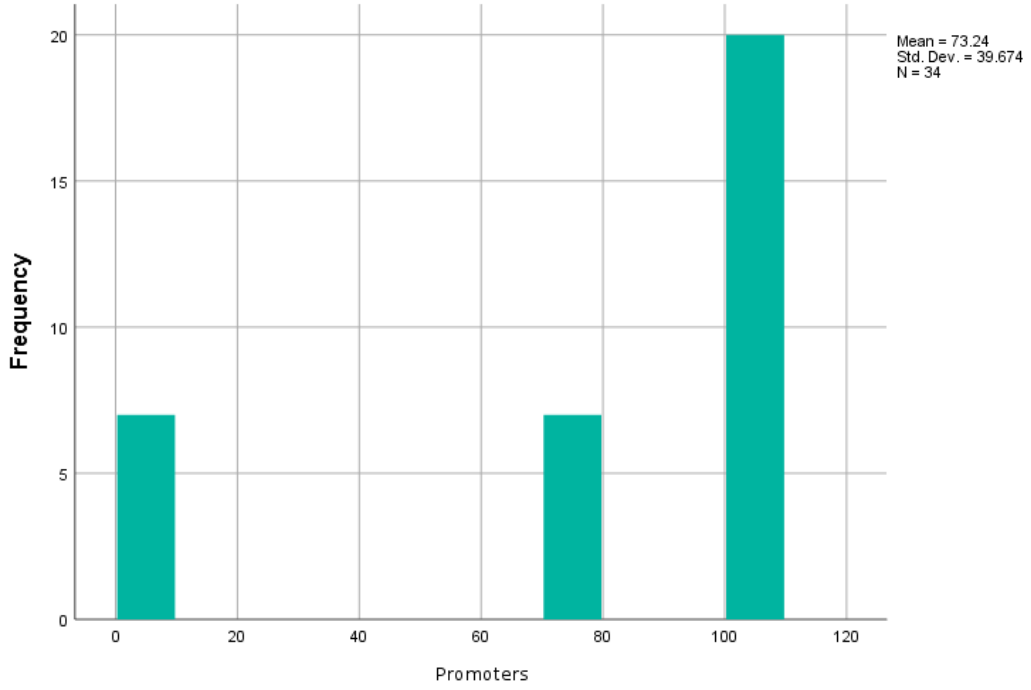


Figure 6. 11: Promoters of the support of TUT's libraries activities to ideal 7

h. Ideal 8: Promotes shared values and symbols

Most participants were not in favour of the support of TUT's libraries activities to ideal 8 of the TUT Transformation Framework (see Figure 6.12). This data is divided between detractors and passive. It connects with the data in 6.1.3f because the researcher speculates it is influenced to a large extend by the lack of cultural activities in TUT's libraries.

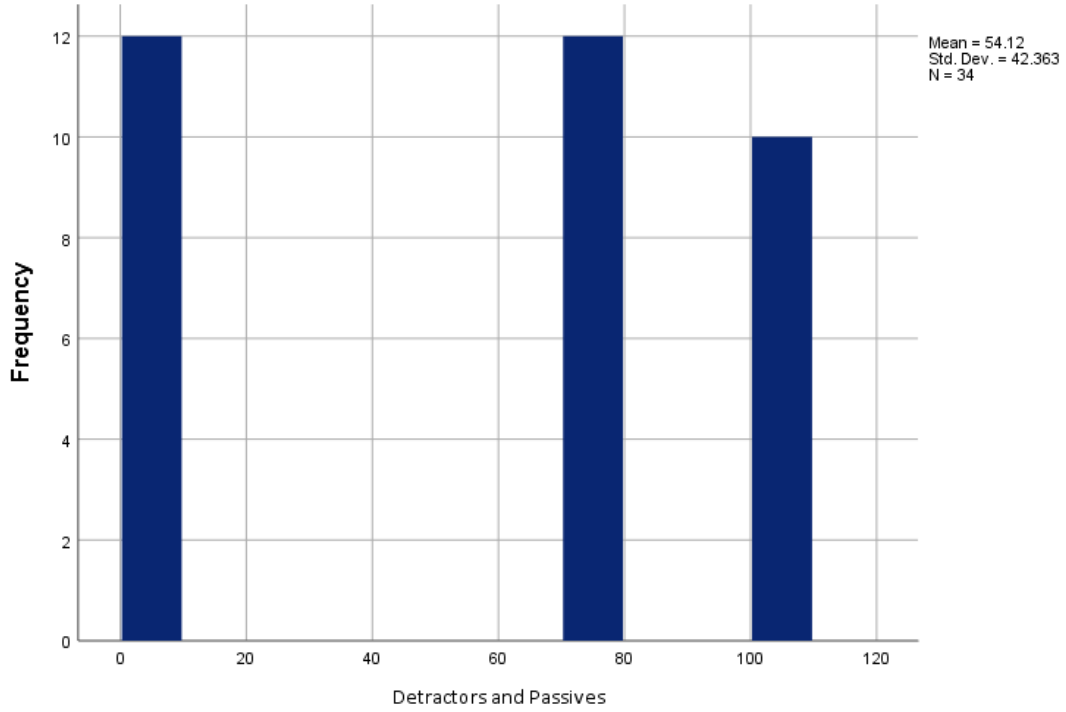


Figure 6. 12: Detractors and passives of the support of TUT's libraries activities to ideal 8.

In summary, the responses of participants in section 6.1.3 (a-h) support responses in section 6.1.2. They confirm the view of TUT's libraries playing a supporting role to the broader university. For instance, there is no agreement that TUT, and by default its libraries should dedicate time and resources towards the advancement of knowledge in all its forms, including indigenous knowledge, through research. This data confirms that there is a general acceptance of the current context and functions of TUT's libraries.

6.1.4 Clarity of role of TUT's libraries in the Transformation Framework

When asked if the role of TUT's libraries is clearly stated in the TUT Transformation Framework 2017, 26.47% answered "probably not". Also 23.53% answered "definitely yes" and "probably yes" respectively (see Figure 6.13). The 26.47% figure indicates that the majority of participants were doubtful the role of TUT's libraries would be clearly specified. The 17.65% indicates participants were not aware of the contents of the framework. See also section 6.2 for a qualitative analysis of responses from a focus group discussion on the TUT Transformation Framework.

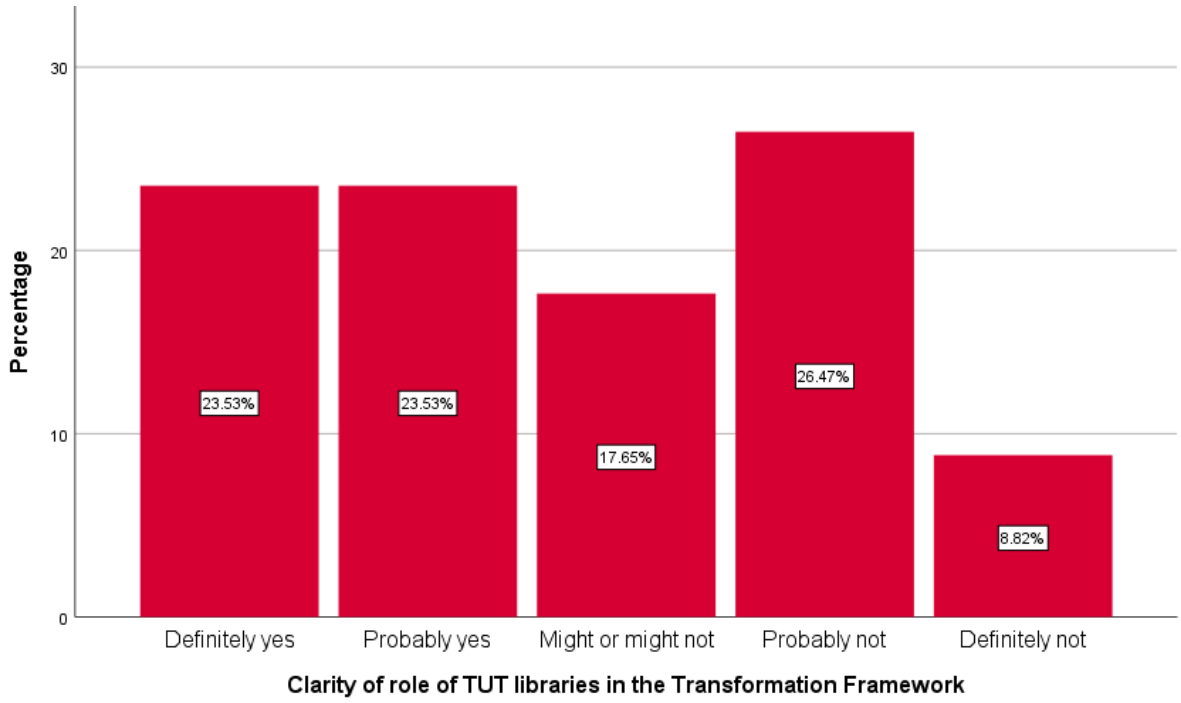


Figure 6. 13: Clarity of role of TUT's libraries in the Transformation Framework

6.1.5 Recommendation of TUT's libraries to students and staff at other South African universities

An overwhelming majority of participants indicated that they were likely to recommend TUT's libraries to students and staff at other South African universities. A total net score promoter of 10 was given in favour of TUT's libraries by eight participants. This means that the majority of participants did not think the current context and functions of TUT's libraries was problematic (see Figure 6.14). This data is confusing since data in previous questions (see 6.1.3a-h and 6.1.4) indicates that there was uncertainty about TUT's libraries. This data confirmed there is a general acceptance of the current situation of TUT's libraries.

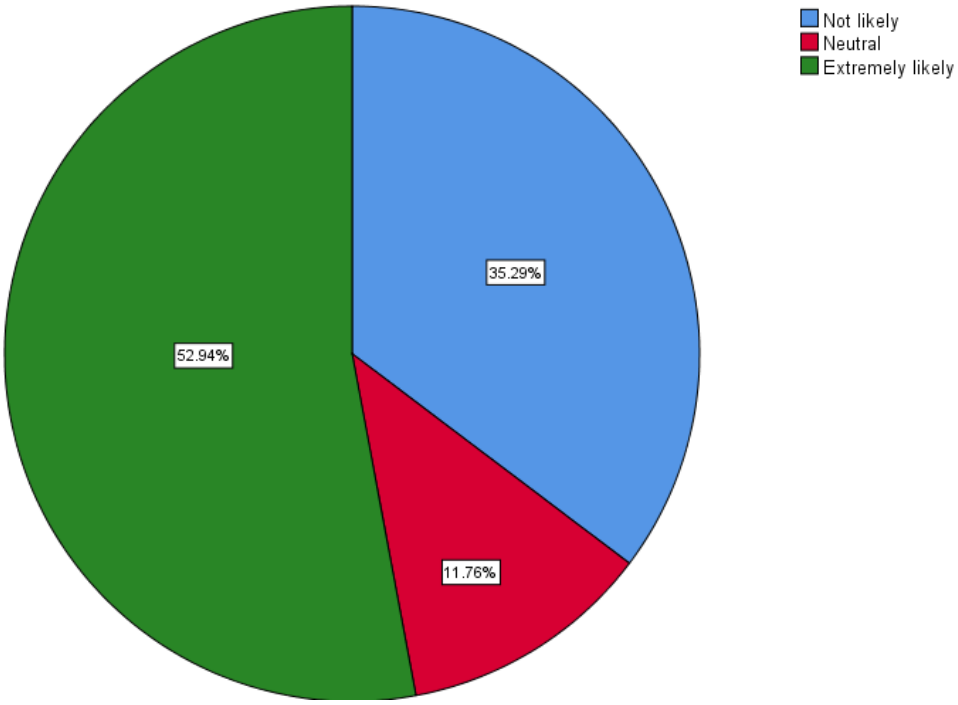


Figure 6. 14: Participants likely to recommend TUT's libraries

6.1.6 Rank TUT's libraries core functions in their order of importance

Participants were asked to rank the following core functions of TUT's libraries in the order of importance. The following responses were given:

a. Collection development

   At least 34.48% of participants ranked collection development as the most important core function (see Figure 6.15). As indicated in section 2.2.4, collection development at South African university libraries was impacted by the re-alignment of the higher education sector. Similarly, collection development of all TUT's libraries has been impacted by the merger of three technikons (i.e. Northern Gauteng, Technikon North West, and Technikon Pretoria) which led to the establishment of TUT in 2004.

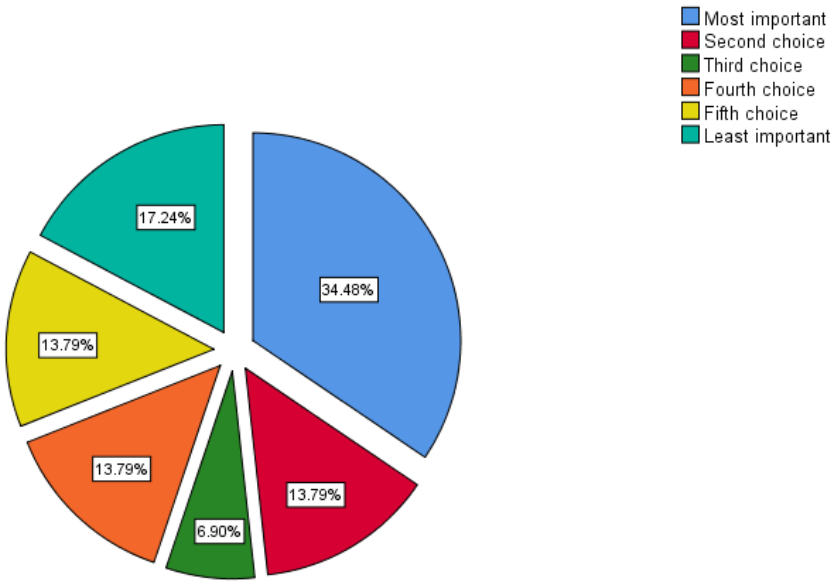


Figure 6. 15: Collection development ranked as the most important

b. Information provision

Out of thirty five, 31.03% of participants chose information provision as a second choice while 20.69% chose it as the most important and third choice (see Figure 6.16). Choosing information provision as a second and third choice confirms a general perception that TUT's libraries should continue with the passive supporting role to the university (see section 6.1.2). Students and faculty staff rely on the provision of information for the success of academic programmes.

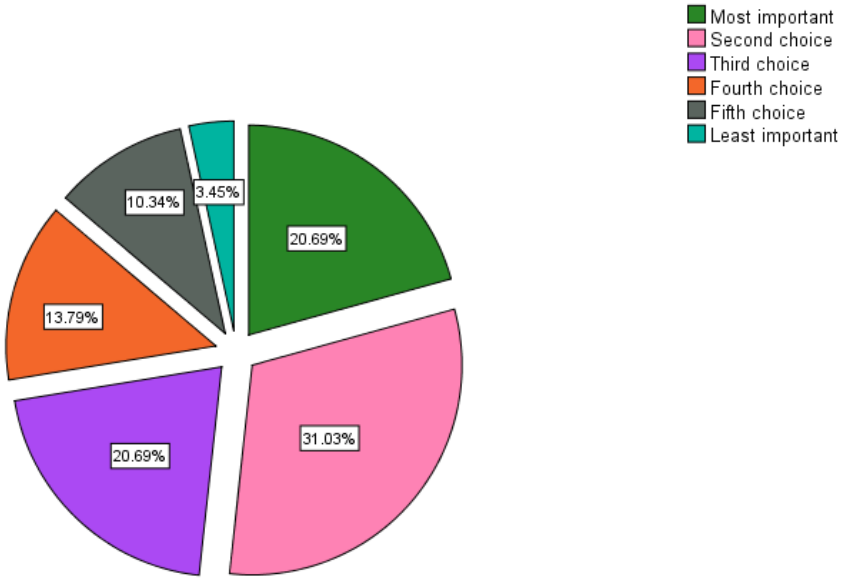


Figure 6. 16: The ranking of Information Provision

c. Preservation and scholarly communication

Most participants (31.3%) ranked preservation and scholarly communication as a third choice. This data is interesting given the question raised by Steele (2014) earlier (see 2.2.6). He asked who owns scholarly communication in the 21st century and what role can libraries play in future? This data indicates that preservation and scholarly communication is not a priority of TUT's libraries (see Figure 6.17). The current situation does not augur well for the future involvement of TUT's libraries in determining the intellectual rights and ownership of scholarly communication. This data corroborates Mason's (2017) narration of the historical tradition of researchers and universities selling off intellectual property rights to publishers (see 2.2.6). It is therefore not difficult to note the same tradition shapes the current context and functions of TUT's libraries.

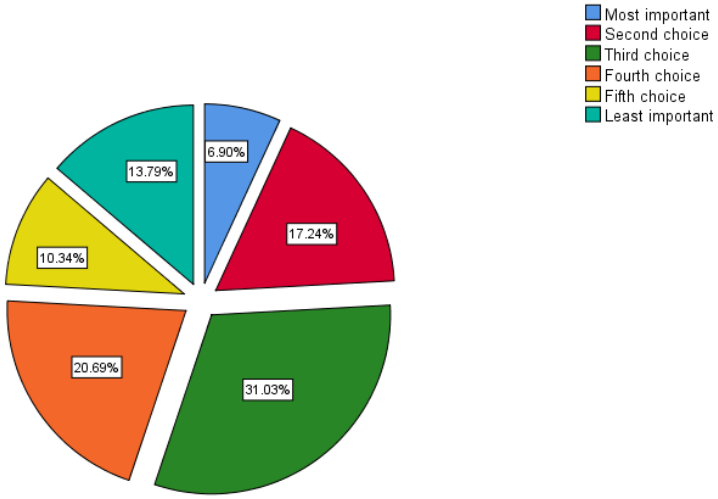


Figure 5. 17: The ranking of Preservation and scholarly communication

d. Information literacy

The majority of participants ranked information literacy fourth, followed by third and second rankings respectively (see Figure 6.18). As indicated in Chapter Two (see 2.2.9), information literacy had been assigned to the job profiles of librarians until the module TUT101 was introduced in 2016. For the past two years, TUT101 has not been synchronized with academic programmes. For instance, librarians teach information literacy while academic literacy is taught by faculty staff members. The ranking of information literary as a fourth choice by a majority of participants puts a spotlight on the

disparity between academic programmes and library programmes (see also the rating of teaching and learning in 6.1.8h).

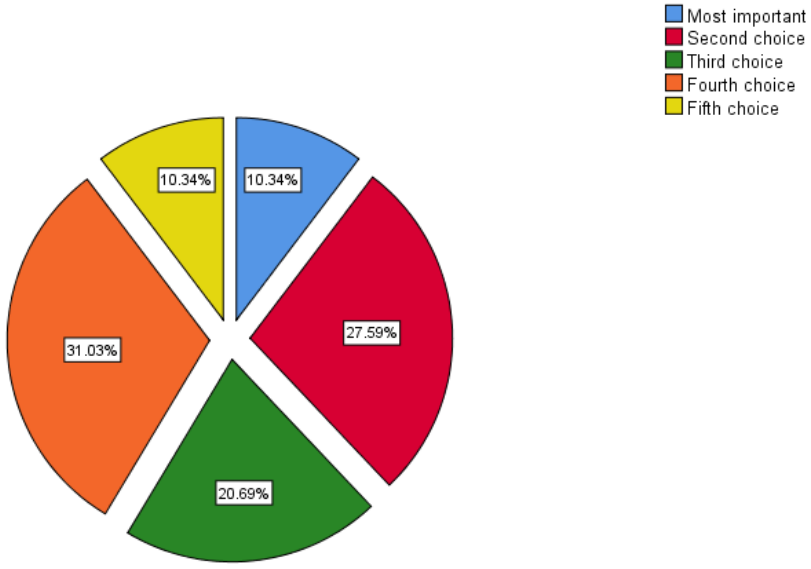


Figure 6. 18: The ranking of Information literacy

e. Learning and research spaces

Of thirty five participants, 34.48% ranked learning and research spaces fifth and least important while 17.24% ranked it as the least important (See Figure 6.19). This data connects with a review of the historical connection between academic libraries and research libraries in Chapter Four (see 4.1). Despite the fact that academic libraries have a historical relationship with research libraries, the current context and functions of TUT's libraries puts less emphasis on learning and research as a prerequisite for knowledge production, application and use.

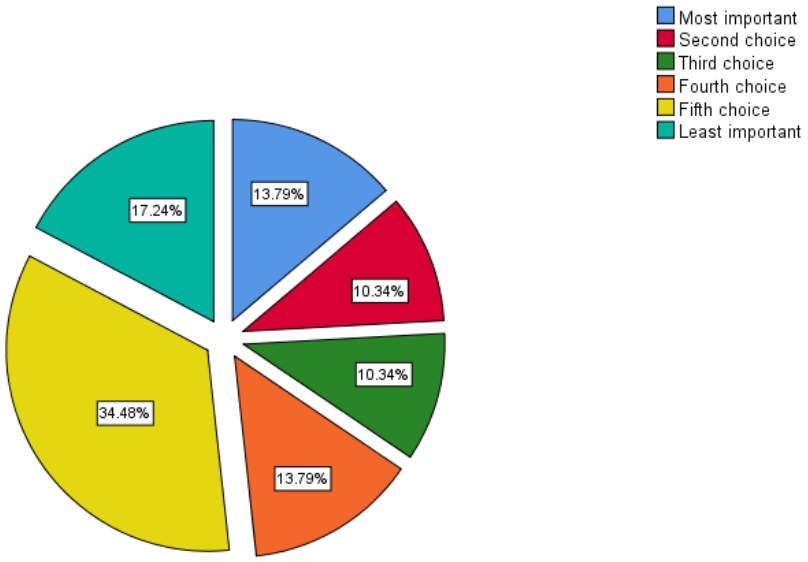


Figure 6. 19: Ranking of learning and research spaces

f. Promotion of a culture of reading

The majority of participants ranked promotion of a culture of reading as the least important (48.28%) and fifth choice (27.59%) respectively (See Figure 6.20). This data supports the assertion made in Chapter Four (see 4.1 and 4.1.1). At TUT, the promotion of reading is done for discipline specific purposes and not necessarily to encourage reading of leading journals, treaties, reference books and transactions of learned societies. There is little or no activity for the promotion of reading at TUT's libraries. For example, there are no book clubs within TUT's libraries. Where such activities exist, they are left to students and staff to choose what to read.

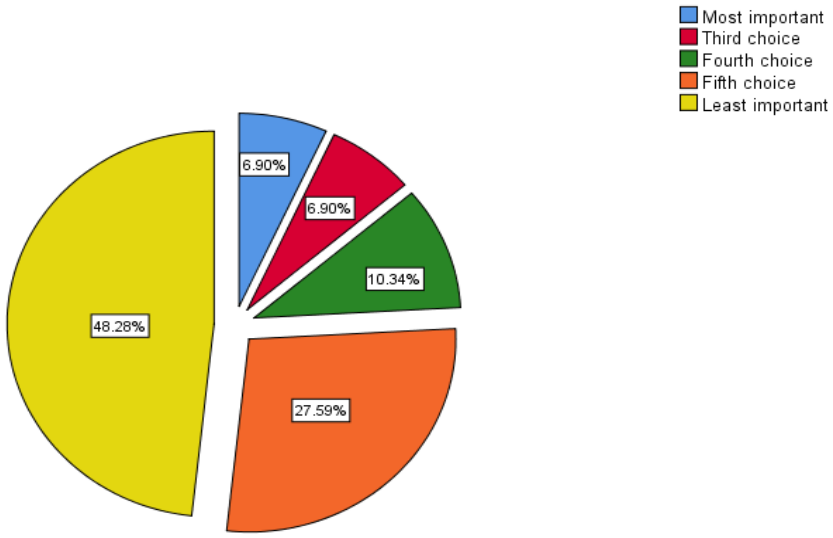


Figure 6. 20: Ranking of promotion of the culture of reading

6.1.7 Satisfaction with TUT's libraries collections

a. Books

Of thirty five participants, 50% indicated they were extremely satisfied with books (see Figure 6.21). Of the two participants who explained why they were extremely dissatisfied, both of them exclaimed that the collections of TUT's libraries were small. As a result, there was a lot of information they could not find in the libraries.

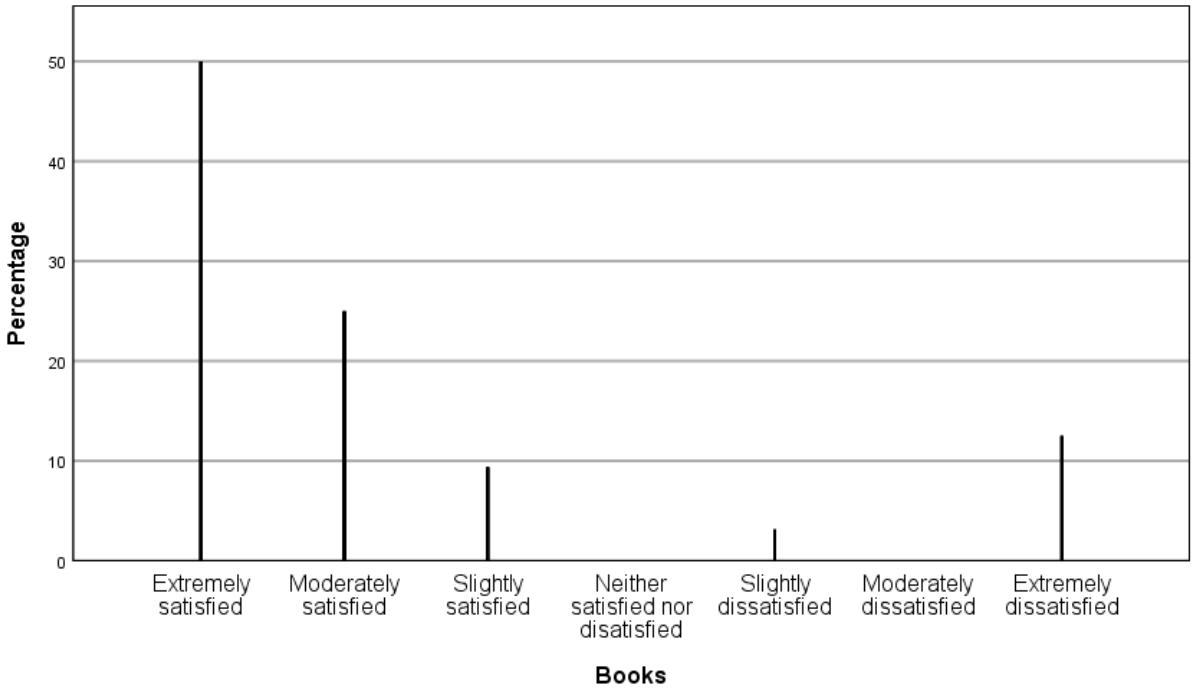


Figure 6. 21: Satisfaction with books

b. Journals

Some participants emphasized their dissatisfaction with books stems from the fact that book collections in most TUT's libraries are small. The majority (see a) of participants were moderately satisfied with journals (see Figure 6.22). More than 20% also indicated they were slightly satisfied as well as neither satisfied nor dissatisfied. This data connects with the data in section 6.1.6e and could be attributed to the current situation in some TUT's libraries were most printed journal collections have been removed from the shelves. Printed journal subscriptions have been cancelled in the past four years because of the shift towards electronic journals.

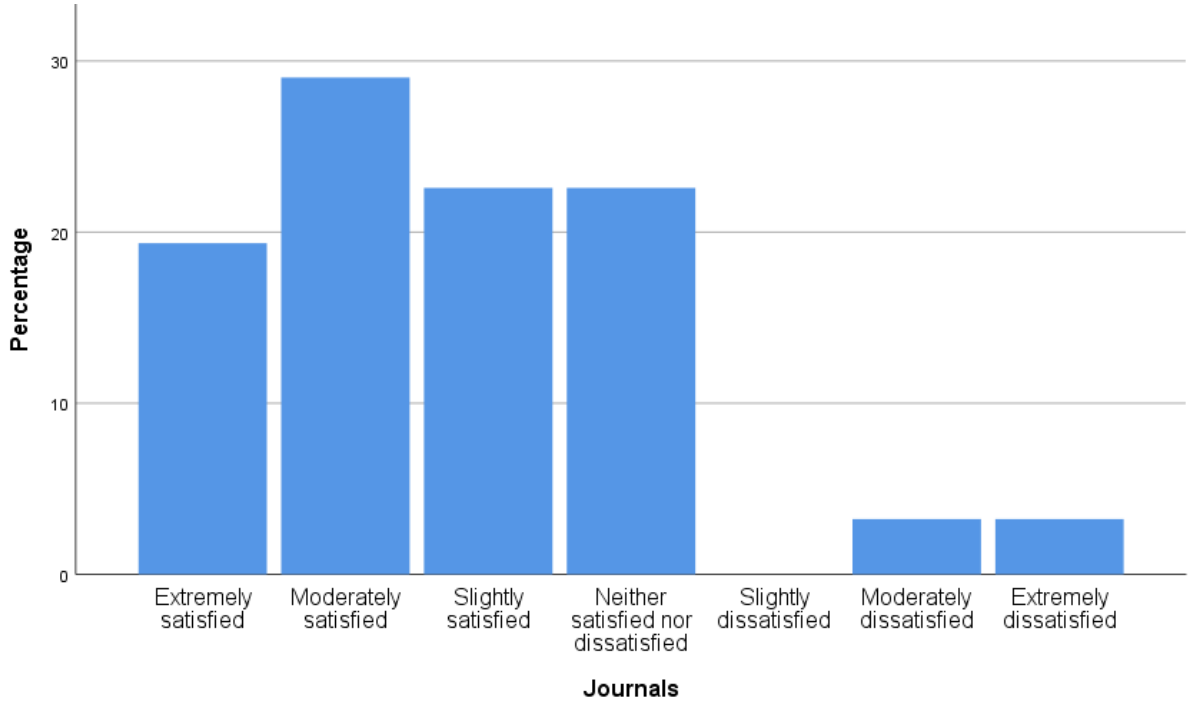


Figure 6. 22: Satisfaction with journals

c. Reference books

When asked about their satisfaction with reference books, the majority of participants indicated they were extremely satisfied with reference books. A considerable number indicated they were slightly satisfied and neither satisfied nor dissatisfied (see Figure 6.23). Similar to the data in 6.1.7c, this data connects with 6.1.6f. Unlike books, reference books are not frequently used in some TUT's libraries. Students often use reference books in the libraries without checking them out of the library circulation module. They are mostly marked 'Library use Only', and cannot be taken out of the library. In addition, TUT's libraries no longer have a historical connection with research libraries as indicated in Chapter Four (see 4.1).

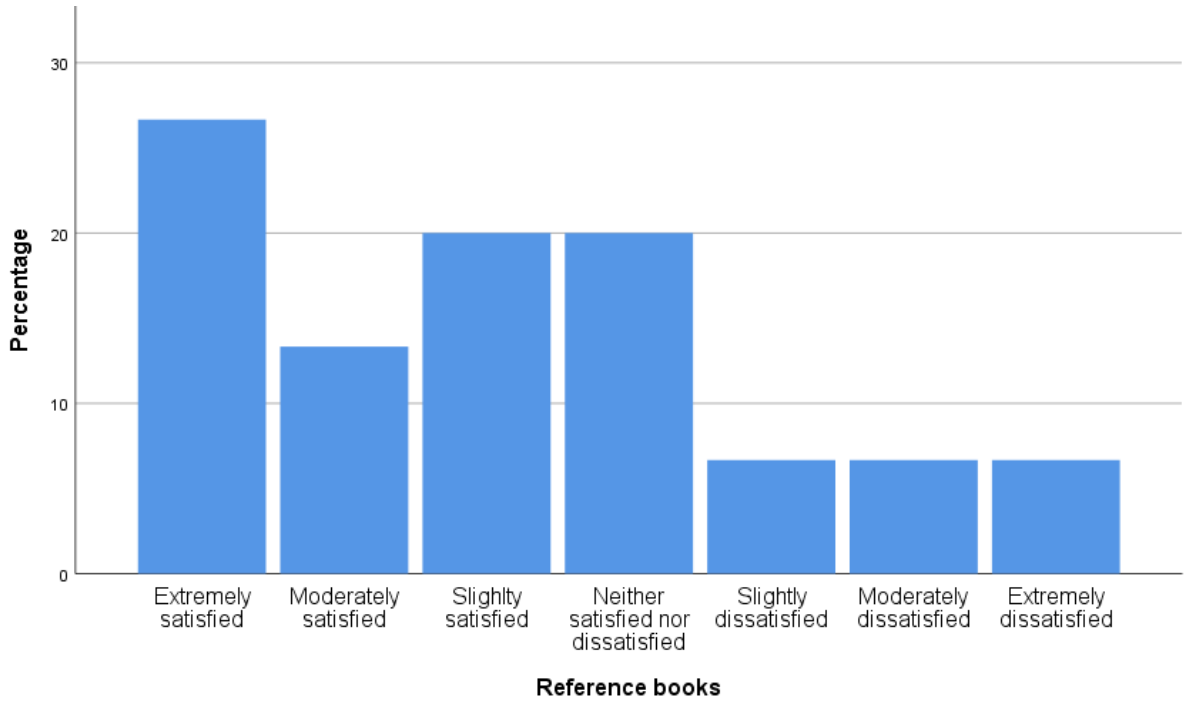


Figure 6. 23: Satisfaction with reference books

6.1.8 Rate TUT's libraries activities

The intention of the question was to find responses to those activities of TUT's libraries affected by change as highlighted in Chapter Two (see 2.1, 2.2.1 and 2.2.9). Participants were requested to rate the following TUT library activities.

a. Web and social media presence

The majority of participants indicated that the web and social media presence of TUT's libraries is much stronger compared to university libraries mentioned in Chapter Two (see Figure 6.24). This rating includes the presence of TUT's libraries website and their use of social media. This data is interesting given the fact that TUT's libraries do not currently use social media and the library website is not updated regularly. The Library and Information Services Transformation Summit which took place on the 28th June 2018 in Pretoria was dominated by presentations recommending the use of digital platforms including social media. Most presenters' emphasized students recommend the use of Facebook. The library website page is not regularly updated because the names of employees who have resigned have not been removed and updated. The TUT's libraries

page hosts the Online Public Access Catalog (OPAC) as well as links to a database of electronic resources and the university's repository.

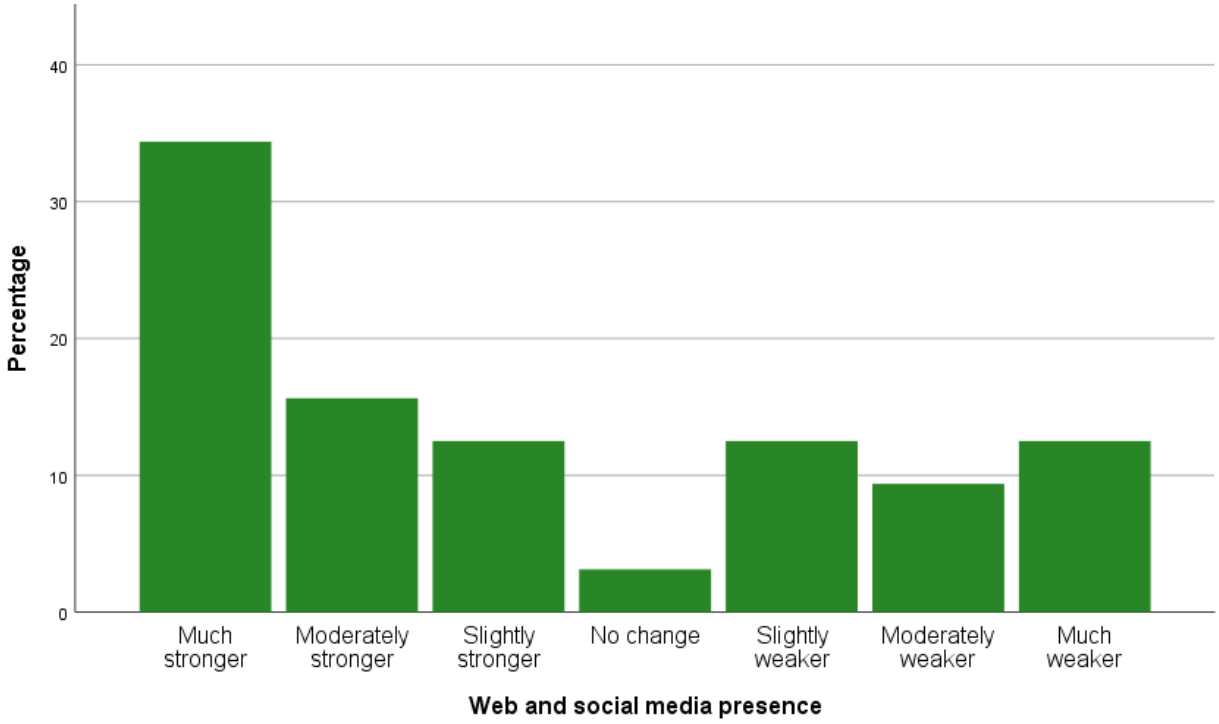


Figure 6. 24: Rating of TUT's libraries web and social media presence

b. Library management and research

Although most participants indicated that library management and research were "much stronger", "moderately stronger", more than 10% indicated it was slightly weaker (see Figure 6.25). The latter part of the data is interesting given the data in sections 6.1.6f and 6.1.7b. For instance, it could be attributed to the ranking of learning and research spaces as a least important function and the neutrality in the use of journals (see also 6.2 and 6.2.4). TUT is currently number one in terms of student enrolment, the same cannot be said about its libraries in terms of research output (see also 6.2.4).

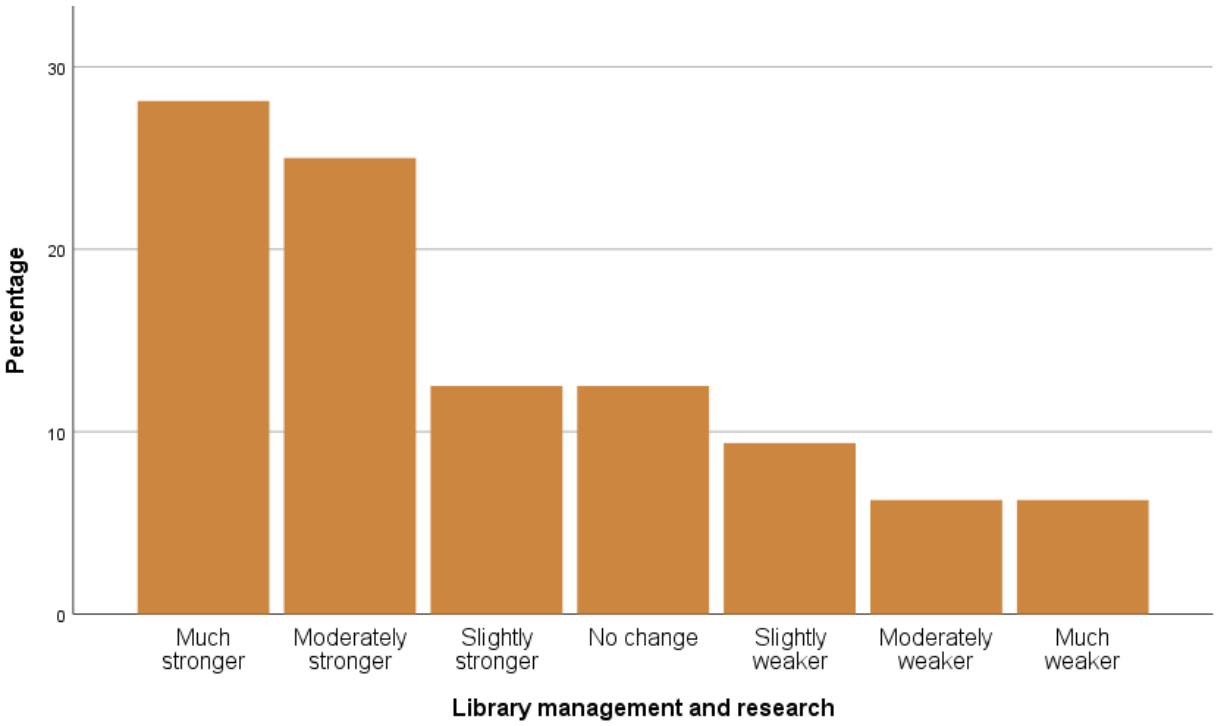


Figure 6. 25: Rating of library management and research

c. Collection development

In section 6.1.6, the majority of participants ranked collection development as the most important function of TUT's libraries. It is therefore not surprising that collection development is rated as moderately stronger by most participants. More than 10% of participants indicated that there was no change as far as collection development was concerned (see Figure 6.26). This is interesting given the fact that collections in TUT's libraries ae largely influenced by the merger between institutions of higher learning. This was discussed in the literature chapters (see 2.1). In addition, the model used to establish the TUT's libraries after the merger in 2004 is Australasian (see 4.11.1). The collection development policy of TUT's libraries has also been influenced by this model.

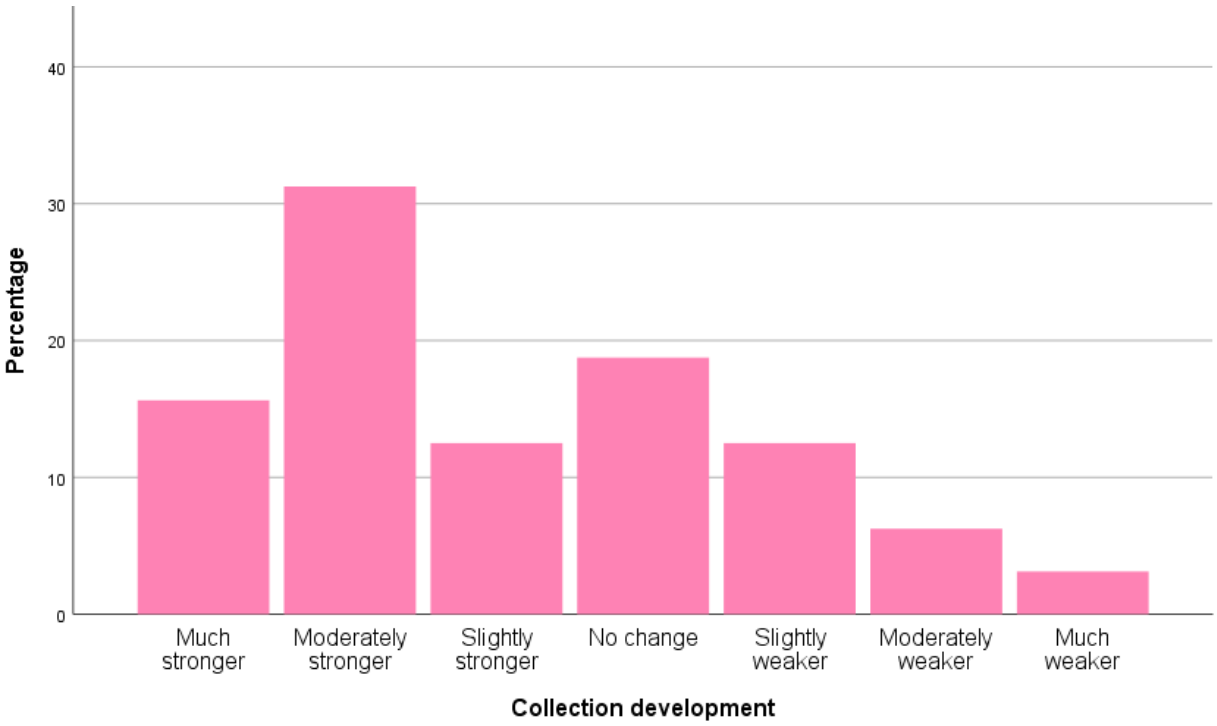


Figure 6. 26: Rating of collection development

d. Ordering, acquisition and circulation

As indicated in Chapter Two (see 2.1 and 2.2.5), TUT's libraries use a modern library management system to order, acquire and circulate library items. Quite recently, Sierra replaced the Millennium library management system. Perhaps that is the reason why most participants rated ordering, acquisition and circulation as "moderately stronger" and "slightly stronger" (see Figure 6.27). However, most of the resources are ordered and acquired from publishers, and this remains a challenge for TUT's libraries. This point corroborates the views of Steele (2014) and Mason (2017). The authors indicate that the tradition of authors selling their intellectual property rights to publishers' dates back to ancient Greece and has not changed (see 2.1 and 2.2.6).

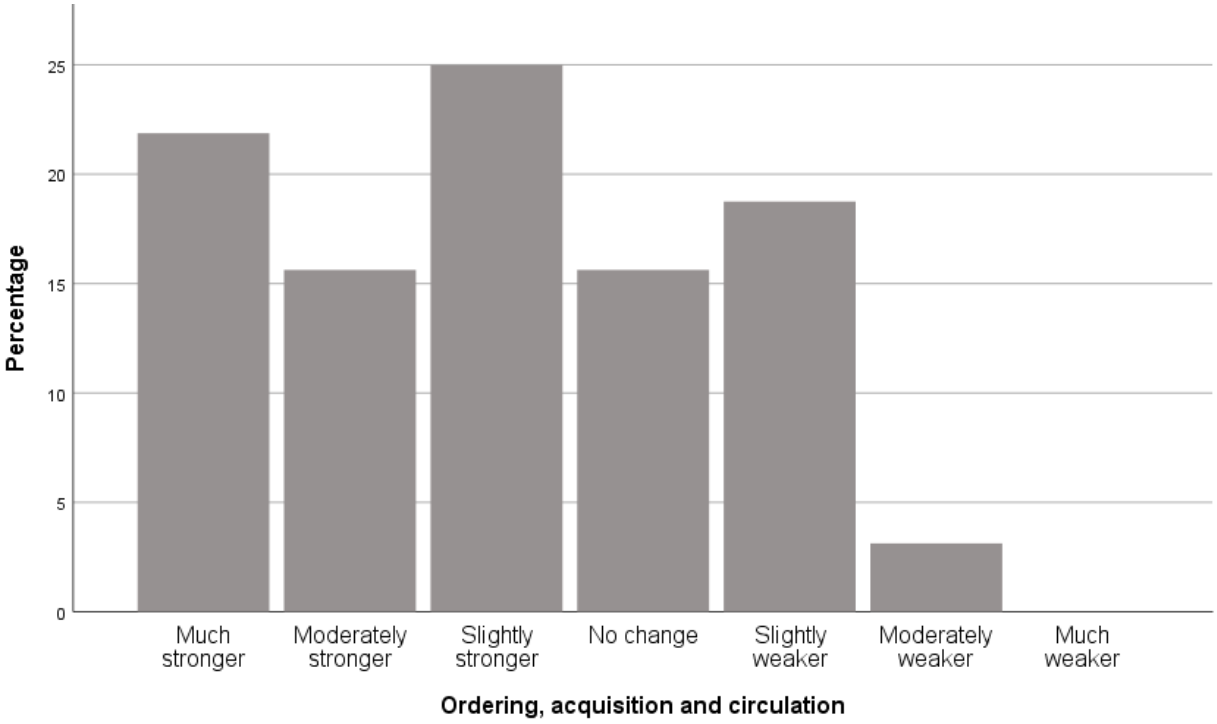


Figure 6. 27: Rating of ordering, acquisition and circulation

e. Organisation and storage of scholarly communication

Most participants indicated that organisation and storage of scholarly communication is "moderately stronger" (see Figure 6.28). This data is not surprising given the current context and core functions of TUT's libraries. The LIS department at TUT organises and stores scholarly communication in the form of printed books, serials and journals for all its libraries. In addition, it organises and stores electronic scholarly communication in the form of dissertations, conference papers, and journal articles through the university repository.

However, the role of TUT's libraries in organising scholarly communication is overshadowed by the fact that they do not participate in related functions that are relevant in a knowledge system (see also 4.12.8). Thus, rating organisation and storage of scholarly communication as moderately stronger does not necessarily indicate strength in the related processes of knowledge production such as publishing. In Chapter Two (see 2.1 and 2.2.6.1), Le Roux (2013) explains how publishing influenced the academic culture of universities and university presses during the colonial and apartheid past. The current context and functions of TUT's libraries still reflect, to a large extent, the academic culture

from the colonial and apartheid past. Most of the books organised and stored in TUT's libraries are published by multinational companies that have a monopoly in the academic publishing industry. Publishers such as Van Schaik, Juta and Pearson, just to mention a few, were established during the colonial and apartheid era.

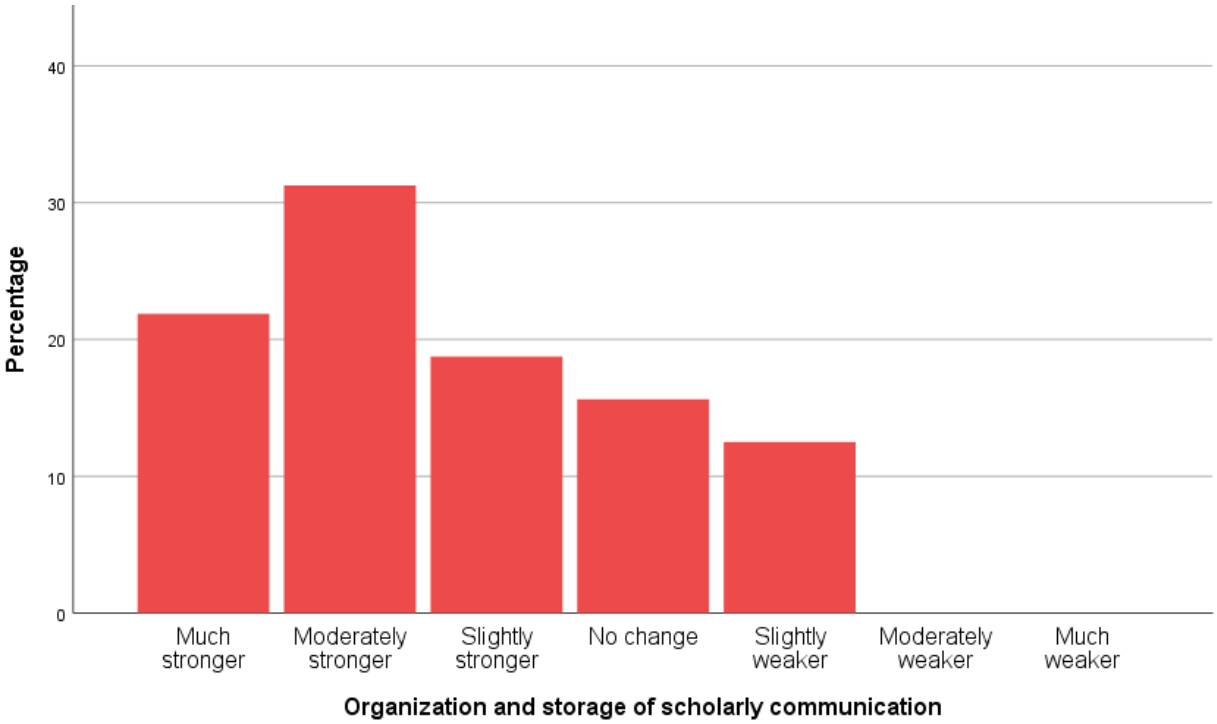


Figure 6. 28: Rating of organisation and storage of scholarly communication

f. Academic integrity systems

The overwhelming majority of participants indicated that academic integrity systems were much stronger, moderately stronger, and slightly stronger. More than 15% indicated there was no change in the academic integrity systems of TUT's libraries (see Figure 6.29). This data means that participants are comfortable with the academic integrity systems of TUT. The latter part of the data confirms the data in 6.1.8e. The academic culture of TUT has been largely influenced by publishing practices of the colonial and apartheid past.

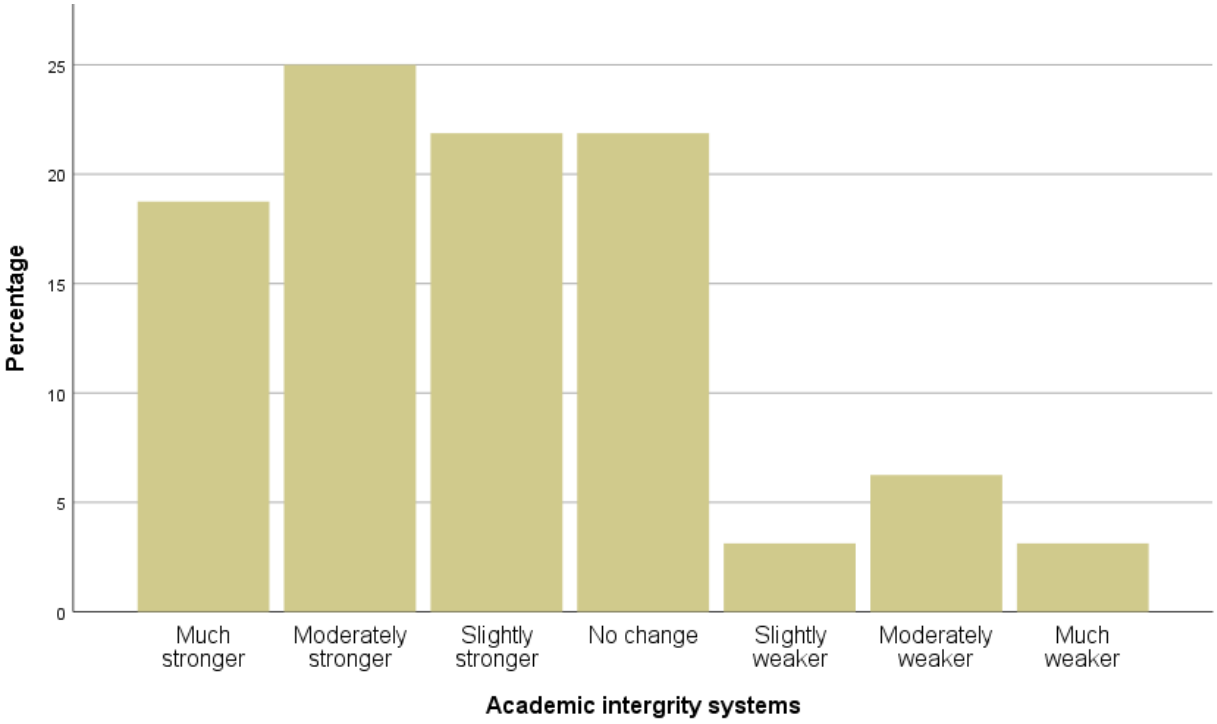


Figure 6. 29: Rating of academic integrity systems

In Chapter Two (see 2.2.7), Drinan and Gallant (2008) assert that the integrity of academic systems of universities in the US were under threat because the responsibility of enforcing rules was left to faculty staff. Technological advancements were also allowing students to violate copyright laws. Similarly, the current context and functions of TUT's libraries do not allow librarians to maintain academic integrity systems because faculty staff are left to assume such a role on their own. This is often done without the appropriate training of faculty staff.

g. Classification systems

Of thirty five, less than 30% of the participants indicated the classification system used in TUT's libraries is "much stronger", "moderately stronger", and "slightly stronger". More than 20% indicated that there was no change (see Figure 6.30). The latter finding corroborates the critique of classification systems such as DDC as discussed in Chapter Two (see 2.1 and 2.2.8). DDC has been in use since TUT was established after the merger of the former technikons (i.e. Northern Gauteng, Technikon North West, and Technikon Pretoria).

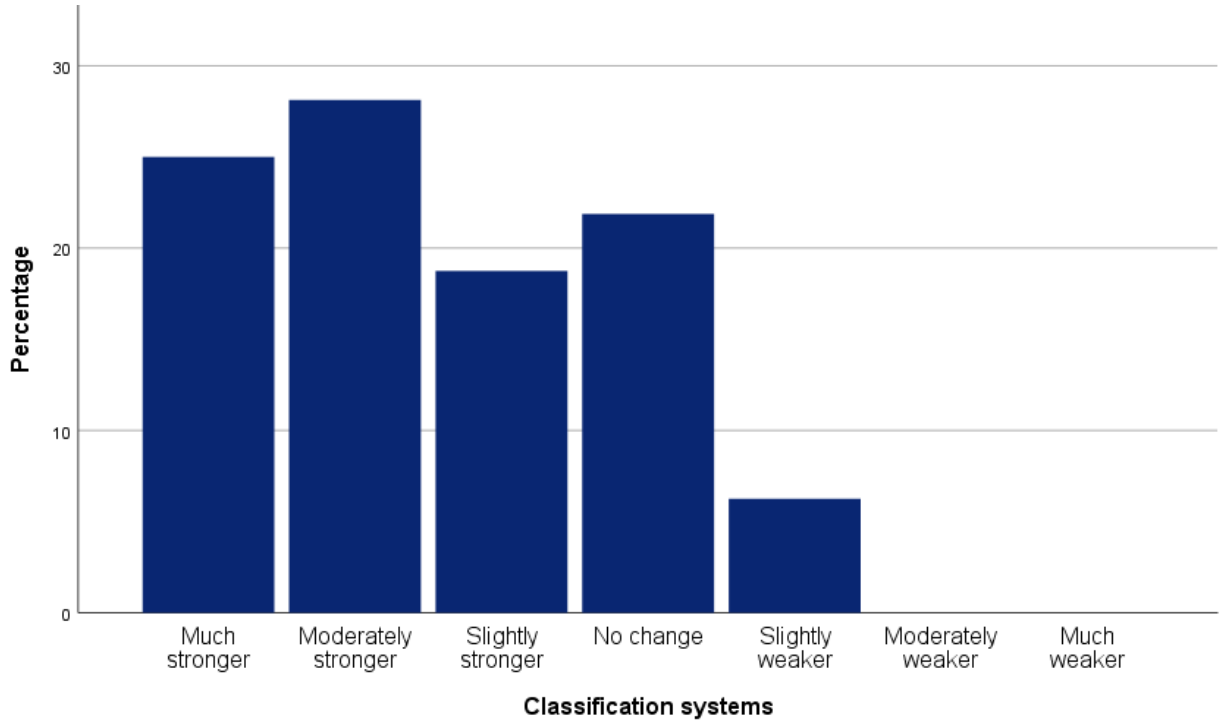


Figure 6. 30: Rating of classification systems

h. Teaching and learning

The majority of participants indicated that teaching and learning were much stronger in TUT's libraries (see Figure 6.31). This data is interesting given the fact that the majority of participants ranked information literacy fourth in section 6.1.6d. It means that participants do not see a connection between academic literacy and information literacy. This is informed by the current situation were information literacy is taught by information literacy librarians while academic literacy is left to faculty staff.

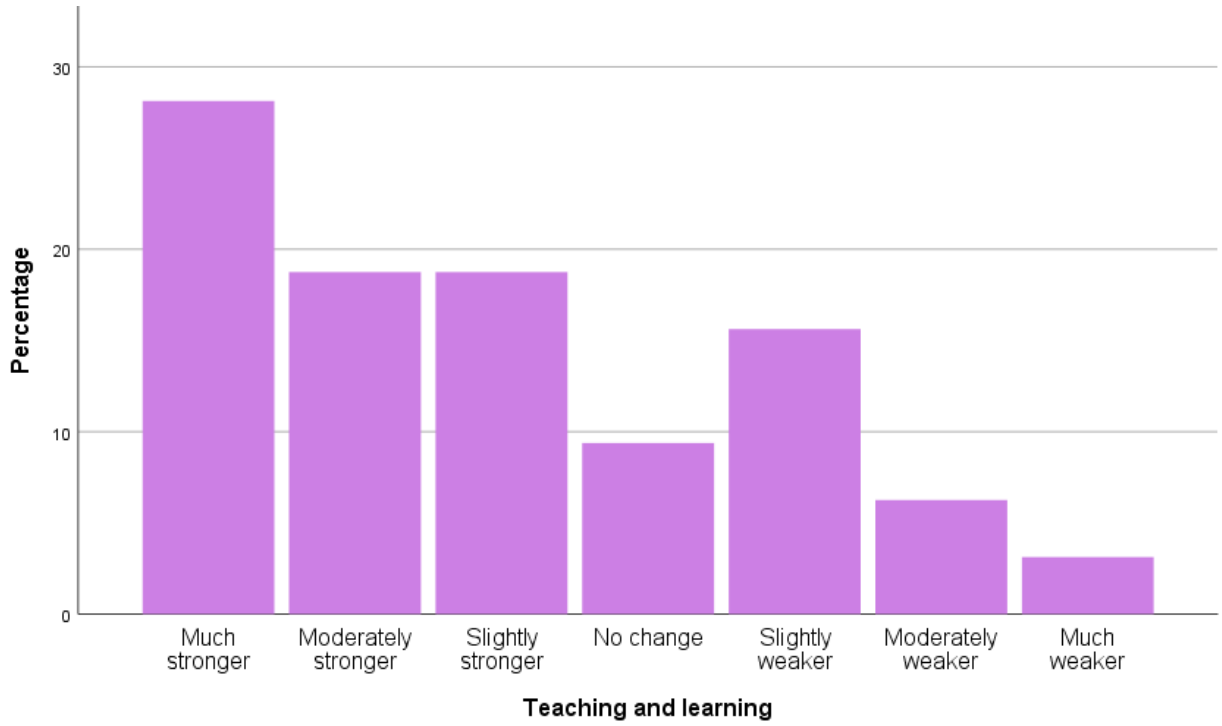


Figure 6. 31: Rating of teaching and learning

6.1.9 Engagement of TUT's libraries with the discourse on 'africanization' and 'decolonization' in higher education

The majority of participants described TUT's libraries engagement with the discourse on "africanization" and "decolonization" in higher education as extremely clear (see Figure 6.32). However, this data is ambiguous since the researcher could not find any document that describes TUT's libraries' engagement with the discourse on "africanization" and "decolonization" in higher education. The researcher can only speculate this data reflects the general perception that TUT's libraries should remain passive in spite of the changes taking place in higher education.

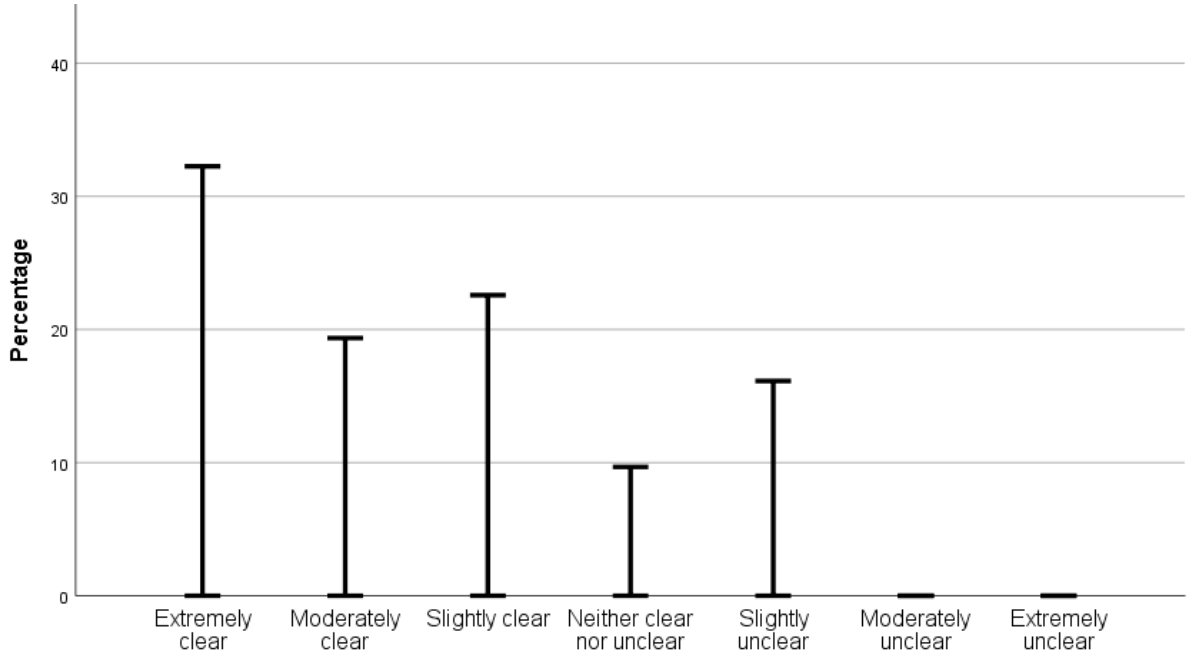


Figure 6. 32: Engagement of TUT's libraries with "decolonization" and "africanization" discourse.

6.1.10 TUT's libraries current relationship with local communities

More than 50% of the participants indicated that TUT's libraries current engagement with the general public was average while more than 20% described the relationship as poor. The former data is in line with the data in section 6.1.1b. The latter part of the data elevates the data of Swanepoel and Smit (2003) on the importance of the compilation of annual reports. It was indicated earlier in Chapter Two (see 2.1) that no annual reports of TUT's libraries could be found. In addition, this data contradicts the data in section 6.1.8a. Most participants rated TUT's libraries web and social media to be much stronger despite the fact that TUT's libraries do not use any social media and their website is not updated regularly. The World Wide Web provides organisations of the 21st century with opportunities to engage more with their clients. If used correctly, websites and social media platforms can improve the relationship between organisations and clients. At the time of data collection, TUT's libraries could not be found on any social media platforms. In the case of TUT, regular updates of the library website and the use of social media may assist to improve the relationship with local communities.

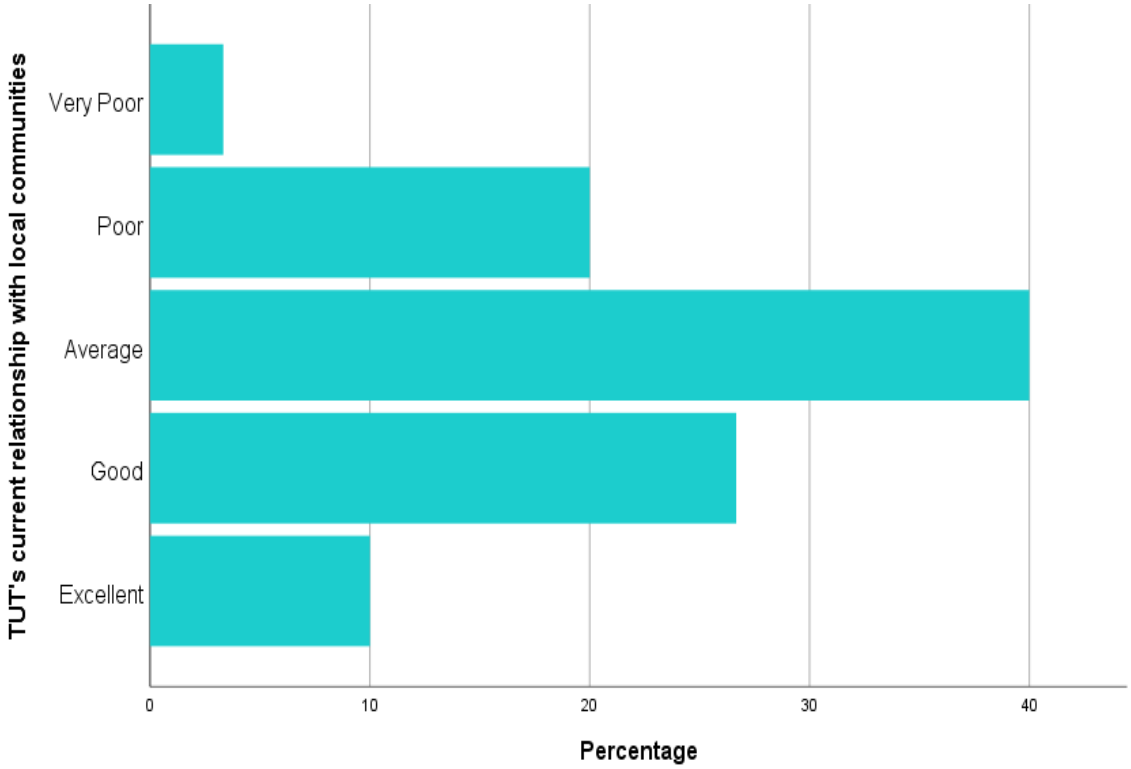


Figure 6. 33: TUT's libraries current relationship with local communities

The next section will analyze the qualitative data collected in the survey, as well as during a focus group discussion.

6.2 Qualitative data

Members of student organisations were invited to a focus discussion group made up of ten members. This was a follow-up to the electronic questionnaire. Five questions (Refer to appendix 1) were asked during the discussion. Responses from the discussion were transcribed into a permanent record using Creswell's data analysis spiral approach. According to Creswell (2007) the spiral consists of categorization or coding, classification and synthesis before the final presentation. The researcher also relied on notes taken during moderation, sound bites from the recording as well as non-verbal communication, gestures and behavioural responses. Importantly, the analysis reflects the epistemological orientation of the researcher. A multiple constructionist reality approach was taken to accommodate the diversity of languages used during the focus group discussion at the TUT Mbombela Campus (see 4.12 and 4.12.8). Members of the focus group were native speakers of local languages and dialects such as *Siswati*, *Northern Sotho*, *Tsonga* and *Sepulana*. The following responses

were collected from a focus group discussion and one open-ended question in the survey questionnaire:

6.2.1 TUT Transformation Framework

Most participants think that the libraries role is not clearly stated in the TUT Transformation Framework. These responses confirm previous data in section 6.1.3a-h, except g where participants promote ideal 7 of the TUT Transformation Framework vision. When asked about their familiarity with the TUT Transformation Framework, all participants indicated that it was the first time they had heard of the document. Prior to the focus group discussion, the researcher had distributed copies of the framework to participants. In addition, the majority indicated that the discussion on #FeesMustFall (see section 2, 5 in TUT Transformation Framework, 2017) and accommodation (see 4.17 in TUT Transformation Framework, 2017) drew a lot of interest from them (see Figure 6.34). Moreover, the LIS directorate has initiated a separate transformation summit post the publication of the TUT Transformation Framework 2017. The summit entitled “New Trends and Technologies: The Future and Beyond”, was held on the 28th of June 2018 (see Appendix 4).

The blocks below signify a family tree of responses to the question about students’ familiarity with the TUT Transformation Framework 2017. Students familiar with the contents of the TUT Transformation Framework 2017 were also requested to indicate which aspects of the document were appealing to them. Examples from the transcript were included to substantiate the responses from students and serve as evidence of data collected during focus discussion groups.

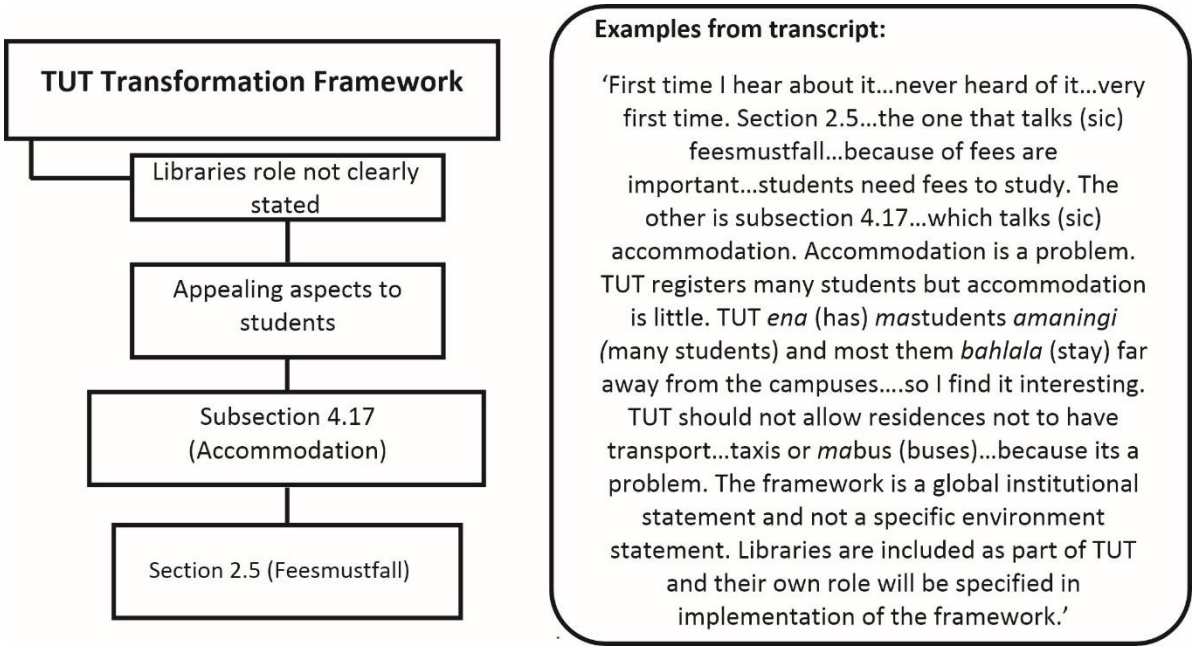


Figure 6. 34: Responses on the TUT Transformation Framework

6.2.2 Collection development as a function of TUT's libraries

The majority of participants said that TUT's libraries' collections were not inclusive of local languages. Participants explained that local languages content was not enough and that the collections were strictly discipline-oriented. Participants concluded that the inclusion of local languages could solve language barriers, promote diversity and forge social cohesion. These responses confirm the data in 6.1.6a on the importance of collection development. Moreover, participants indicated that TUT's libraries' policy for outside members and alumni should be reviewed to encourage partnerships with local communities (see Figure 6.35).

According to the TUT Policy on Language of Teaching, Instruction and Communication (2005), English has been approved as the language of teaching, instruction, communication and documentation. Section 2 and 2.4 of the TUT Policy on Language of Teaching, Instruction and Communication acknowledges "that the vast majority of the South African indigenous languages have either not been fully developed or not been developed at all as academic or scientific languages". As a result, TUT has adopted both Setswana and SiSwati as indigenous languages whose terminology it will develop for academic, scientific and communication purposes. However, according to the data collected from participants, there appears to be slow progress in developing the indigenous languages adopted by TUT in terms of academic

publishing. For instance, the use of the Setswana language in communication is visible in the title of the official student newspaper called *Bua.* The English language still dominates academic book collections at the TUT Mbombela Campus Library in the Mpumalanga region where the majority of the population speak SiSwati.

The blocks below signify responses of participants to the question about collection development, book collections, gaps and weaknesses in TUT's libraries as well as recommendations from participants. Responses from participants are captured in a form of a family tree to show how they relate to one another. Examples from the transcript are provided as evidence of the data collected during a focus discussion group.

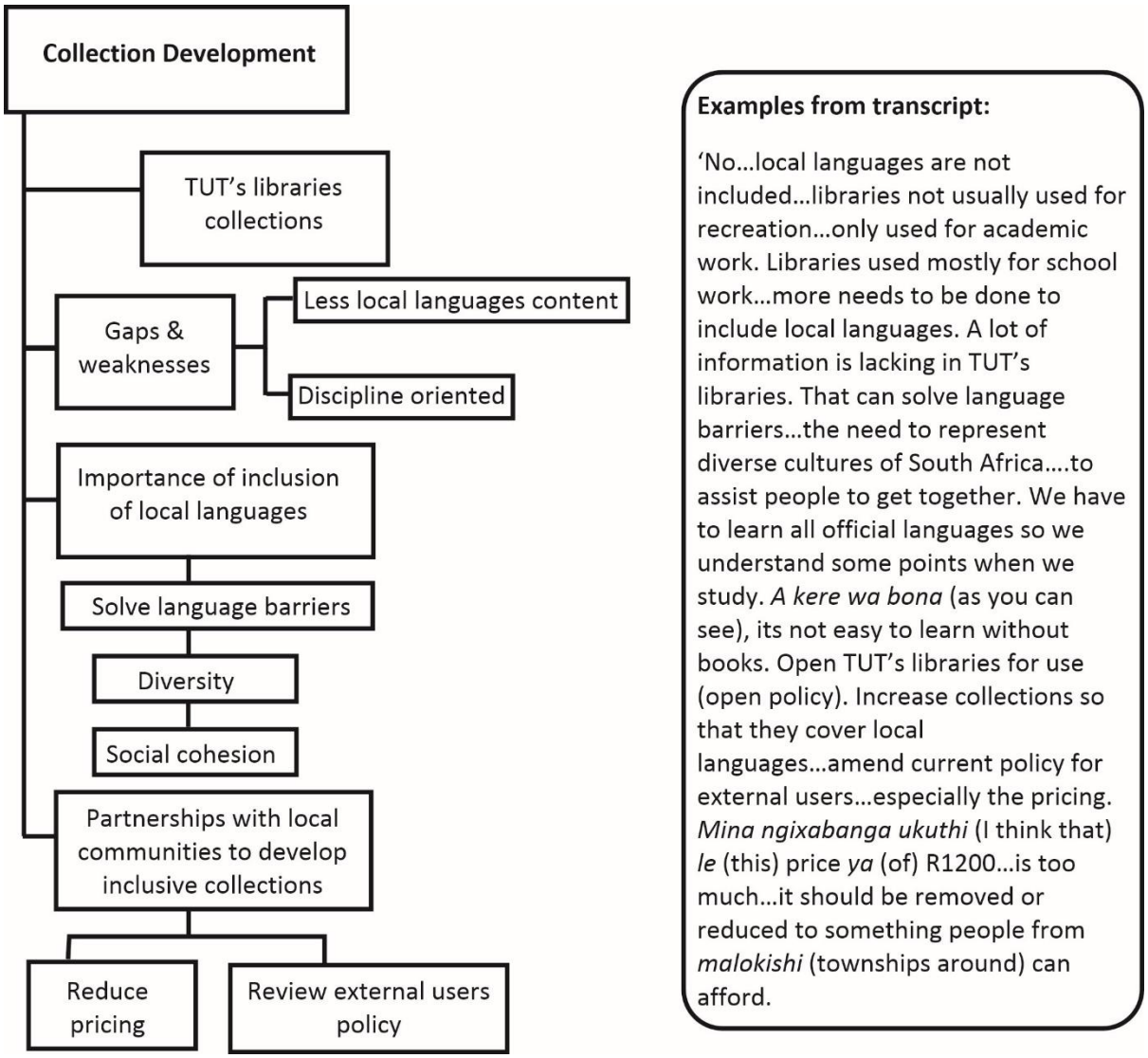


Figure 6. 35: TUT's libraries collections and local communities

6.2.3 TUT library's online presence

The responses confirm the data in section 6.1.8a since the majority of participants affirmed TUT library's online presence was stronger than the online presence of other universities (see Chapter Two). Although participants were aware of the presence of the libraries' website, most of them stated that the absence of TUT library on social media platforms made its online presence weaker. Participants recommended that TUT's libraries should use social media to engage with the public since most students use social media. Their favourites are Facebook, WhatsApp, Instagram and Twitter (see Figure 6.36). Currently, TUT's libraries do not use any social media platforms. The focus of the LIS Transformation Summit held on the 28th of June 2018 at TUT Main Campus in Pretoria was on new digital trends and technologies. The use of social media as a communication tool in TUT's libraries dominated the summit.

The blocks below signify a configuration of the responses from participants regarding TUT library's online presence. The family tree was used to indicate how responses from participants relate to each other. Examples from the transcript were given as evidence of the data collected during the focus discussion group.

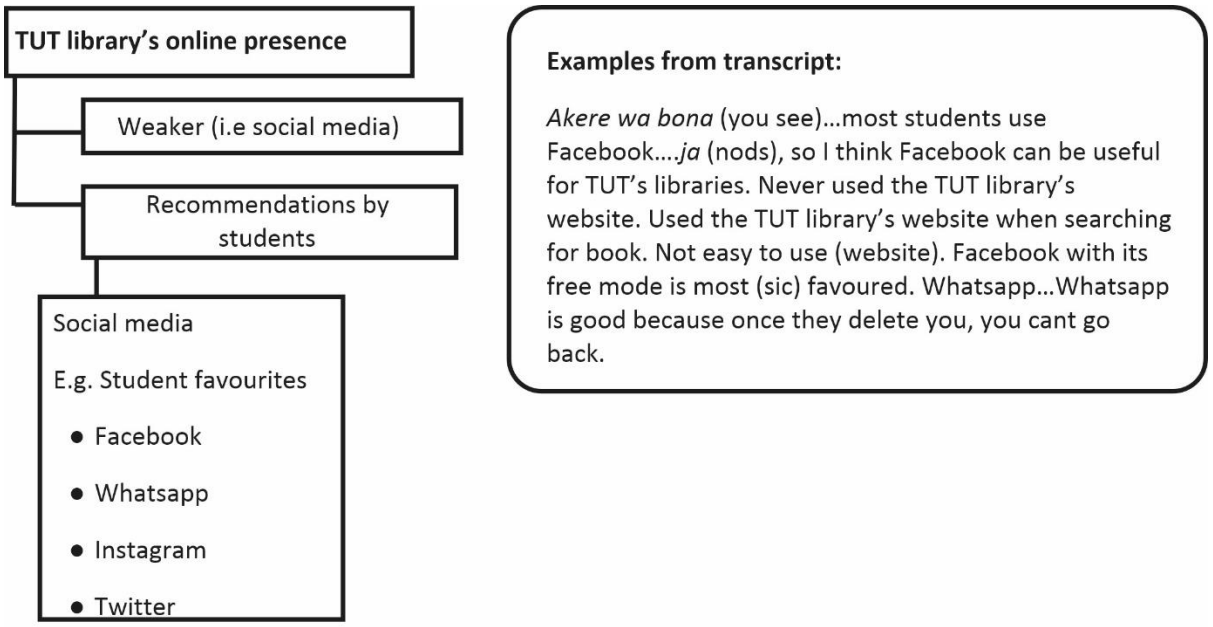


Figure 6. 36: TUT library's online presence

6.2.4 Invitation to participate in scholarly research

All participants from TUT's libraries indicated that invitations to participate in scholarly research from TUT's libraries are scarce (see Figure 6.37). For example, there are no post service survey to determine the satisfaction of TUT's libraries users about the professionalism of librarians. In addition, students seldom receive invitations to participate in surveys, interviews and focus discussion groups from librarians studying towards a post graduate qualification. These responses clarify the data in section 6.1.8b regarding library management and research. The data was not specific in clarifying which of the two (library management and research) were rated as "much stronger" and "moderately stronger".

The blocks below summarise responses from participants about TUT's libraries and scholarly research. Responses are visualized in the form of a family tree to show how they relate. Examples from the transcript are proof of data collected during focus discussion groups and substantiate the responses from participants.

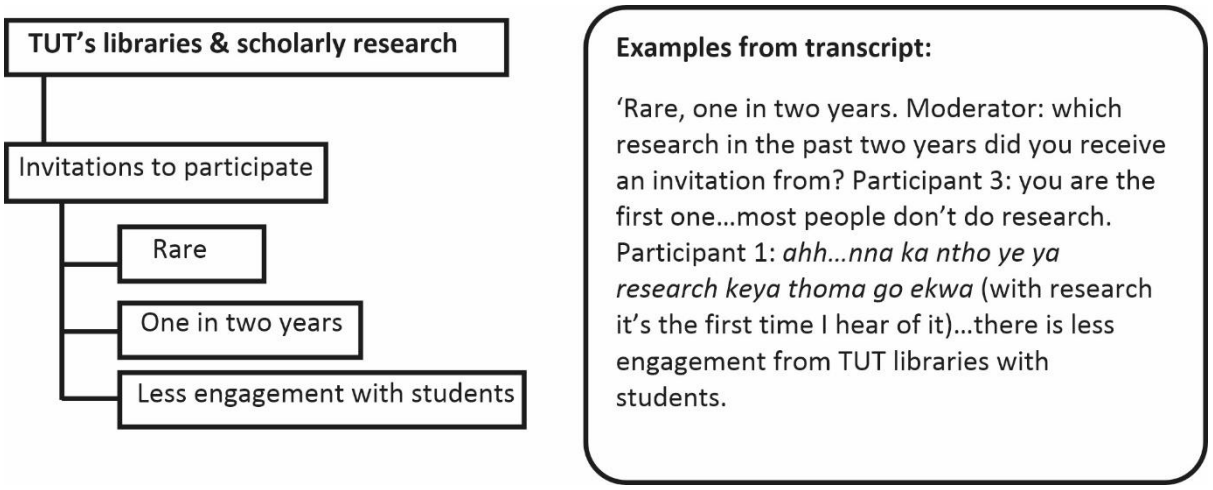


Figure 6. 37: TUT's libraries and scholarly research

TUT's libraries seldom engage in research activities and this is evident in the low number of research articles on TUTDor under the Library and Information Services department. Most of the research output on TUTDor belongs to other faculties of the university (see 2.1). At the time of this study, only five research articles could be found, and the latest was published in 2013.

6.2.5 Additional comments about TUT's libraries

Towards the end of the discussion, participants were requested to make additional comments about TUT's libraries. Most of the comments highlighted TUT's libraries space limitations. Some emphasized that traditional library rules in some libraries were non-existent compared to other universities in South Africa. Examples of traditional library rules include, among others, consulting the library catalogue before locating books on the shelves, keeping silent, not eating or sitting on the floor of the library unless designated as such, not answering phone calls in the library. Others indicated that first time university entrants such as undergraduates need to be oriented about library rules at the beginning of the academic year, especially at the Mbombela library. This would assist TUT's libraries users to behave accordingly when they visit (see Figure 6.38). There are numerous changes taking place in academic libraries both locally and internationally. As indicated in Chapter Two (see 2.1), these changes affect the activities of TUT's libraries such as teaching, learning and research. Therefore, amendments to TUT's libraries' policies need to consider the changing behaviour of, for instance, millennial users.

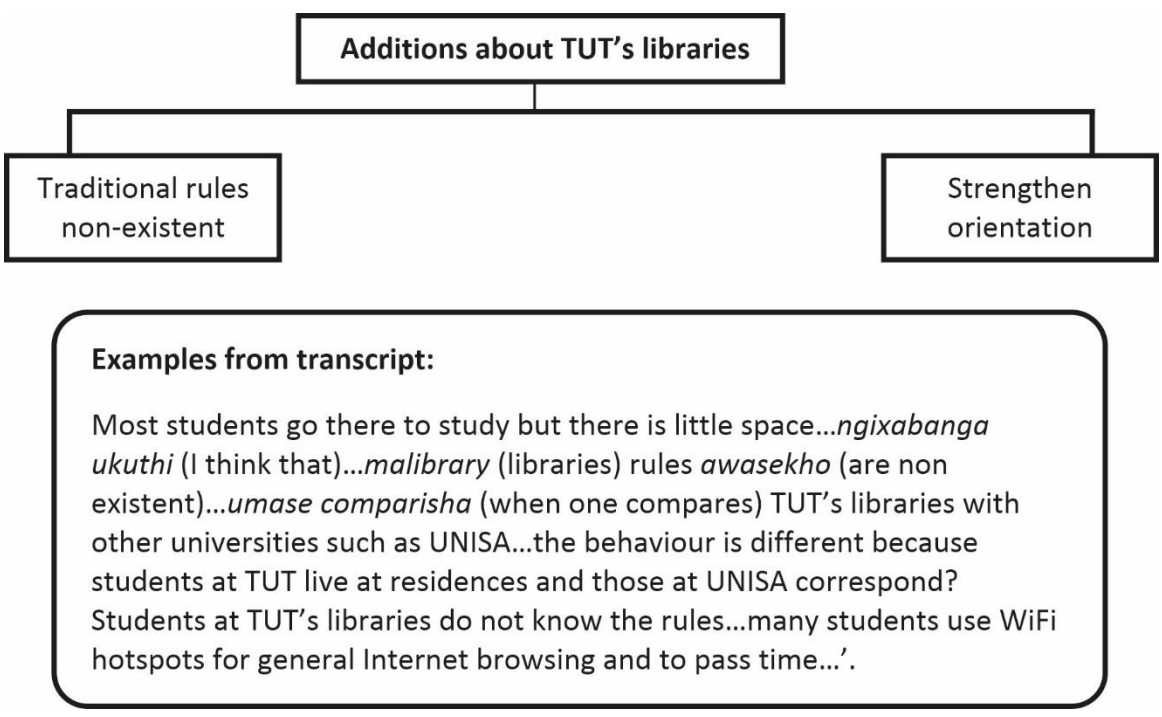
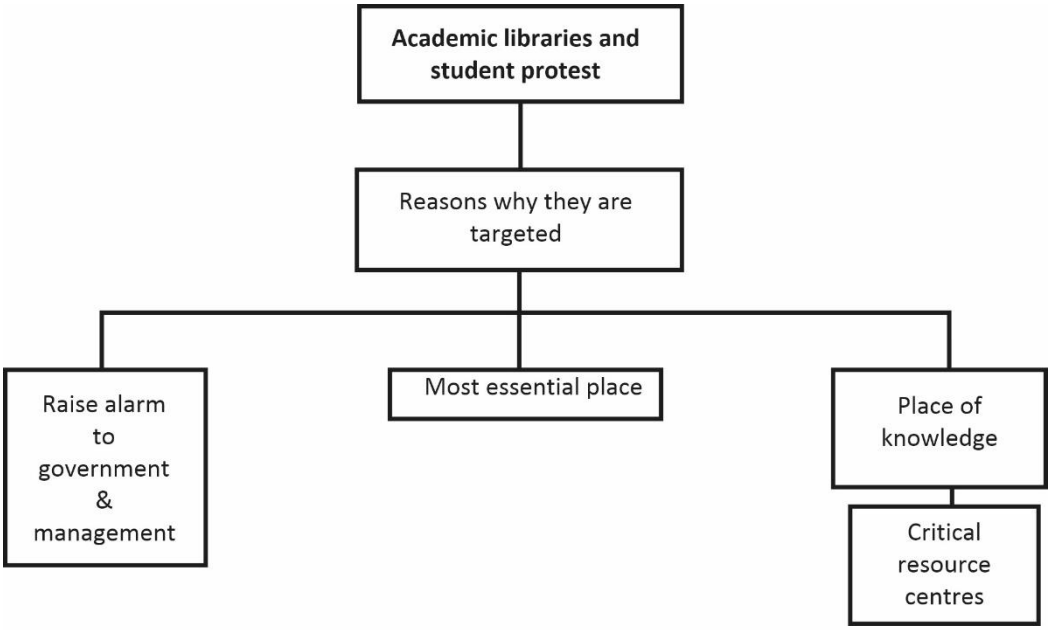


Figure 6. 38: Additional comments about TUT's libraries

The blocks above signify responses collected as additional comments from participants about TUT's libraries. The family tree indicates dominant additional comments from participants. Examples from the transcript were provided to substantiate the additional comments and serve as proof of data collected during a focus discussion group.

6.2.6 Why academic libraries are targeted during student protests

The responses collected in this section connect with the introduction and research in Chapter One. It was indicated that the approach of student social movements is highly politicized and not well thought through (see Poho, 2016). Most importantly, Dahrendorf (1958) illuminates the importance of categorizing and classifying occurrences in order to avoid reducing social conflict to class struggles only. The targeting of academic libraries during protests represents a special type of conflict. It was argued in Chapter One that the support role of academic libraries in universities makes them passive given their historical relationship with research libraries. That the direct link of academic libraries with functions relevant in a knowledge system make their responsibility problematic. Most participants in the survey and focus discussion group indicated that the reason why libraries are targeted during protests is because they are places of knowledge, critical resource centres and a most essential place, just to mention a few (see Figure 6.39). This means that the role and responsibility of academic libraries in society is far greater than their currently-perceived functions. The knowledge they preserve and diffuse has implications for the political, cultural and social well-being of society.



Examples from transcript:

'Because they're the critical resource centres…they hold central powers to student development thus the need to raise concern (sic) targeting them. It is the most essential place that the Dean will not afford to loose (sic) around campus as it uplifts campus performance. Because of the impact libraries have on academic programs. To send a message to the government and executive management to resolve issues. Because library is the place of knowledge and is so significant to have'.

Figure 6. 39: Targeting of academic libraries during protest

The blocks above signify responses from participants regarding the targeting of academic libraries during protest action. The open ended question was asked in the survey questionnaire. The family tree shows how responses relate to each other and examples from the transcript were provided as proof of the data collected.

6.3 Summary

This chapter analysed data collected in an electronic survey and a focus group discussion. The quantitative data was analysed with SPSS while qualitative data was analysed using Creswell's data analysis approach. Histograms, bar charts and pie charts were used to visualise the quantitative data. Family trees of related themes and categories with examples from the transcript were used to visualise qualitative data. The next chapter will draw on the data in this chapter and the focused literature reviewed in Chapters Three and Four to propose an appropriate model for the TUT library service department.

Chapter Seven: Proposed Model for TUT's Libraries

Introduction

This chapter critiques the models evaluated in Chapter Four, and proposes an adapted model for TUT's libraries. It uses the data analysed in Chapter Six to address the shortcomings of the models. Elements of the evaluated models deemed relevant for this study are selected and used to construct the proposed model. The proposed model answers the main research question in Chapter One (see 1.4) and connects with the data analysed in Chapter Six. It is an expansion and refinement of society's knowledge system model evaluated in Chapter Four (see 4.12.8). It also consists of elements from the other models evaluated in Chapter Four that are deemed relevant to the study. In Chapter Two, the context and functions of TUT's libraries are examined. Chapter Four highlights the historical relationship between academic and research libraries as well as that of the existence of the knowledge system across various disciplines. The proposed model seeks to reconfigure TUT's libraries so that they are better prepared to adapt policies in light of changes taking place in higher education. It could also lay the groundwork for what the researcher refers to as the reconfiguration of TUT's libraries.

As already mention in Chapter Three (see 3.1.2.1) and Chapter Four (see Hoskins and Stilwell 2011: 51 in 4.12.7), the researcher acknowledges that university libraries have limited budgets. This could affect the implementation of the proposed model at a practical level. A phased model could be used to implement the proposed model. The general call for the transformation of libraries in the Heher Commission of Inquiry into Education and Training Report should encourage TUT's libraries to look for new revenue streams to implement the proposed model.

7.1 A critique of evaluated models

In Chapter Four, several models were evaluated with the aim of selecting elements of these models which are perceived to be relevant for the case of TUT's libraries. A self-developed set of criteria was used to evaluate these models (see 4.9). These models are used by researchers across the world to find solutions to challenges relating to academic library functions and the higher education landscape, and knowledge systems of contemporary societies.

7.1.1 Models for academic libraries

The following sections critique models that are used to manage change in academic libraries locally and internationally.

7.1.1.1 Online journals: access and delivery model

The model for online journals may assist in solving access and delivery challenges (see 4.10.1). As indicated in Chapter Six (see 6.1 and 6.1.7), the majority of users of TUT's libraries are not entirely satisfied with online journals. The dissatisfaction stems from the cancellation of subscription to printed journals and the migration to digital subscriptions. The model for online journals may provide an alternative solution to the challenge of ordering and acquiring printed journals.

In most TUT libraries, printed journals have been cancelled in the past five years. However, implementing either one of the models for access and delivery of journals will require academic libraries to invest in high bandwidth and/or develop costly Information Technology infrastructure which can deliver such services to users' desktops. This may prove difficult since academic libraries across the world have serious budget constraints and most universities continue to cut these budgets.

According to Hoskins and Stilwell (2011: 51), funding for libraries and the priority given to this within the overall institutional budgets is a matter of great concern for librarians. This model may work well in developed countries where academic libraries are equal partners with academic departments in the university, however, it might not necessarily work in developing countries where academic libraries are generally perceived as supporting entities and their role is not clearly defined as illustrated by the data in Chapter Six (see 6.1 and 6.1.2, 6.1.4). Hard copies of printed journals for the previous 10 years should be retained as a remedy for TUT's libraries. These copies should be organised in a separate shelf clearly marked "journals" for ease of access. More space should be created for the printed copies in the form of research commons for TUT's libraries.

7.1.1.2 Convergence of academic libraries and IT departments model

Another model evaluated was the convergence of academic libraries with IT departments. It has already been acknowledged that this model has been introduced to TUT's libraries with the assistance of other departments (see 4.10.2). The two approaches to the model put forward by Joint (2011) should be noted. Although the author argued for the unified information service approach, there are challenges for academic libraries.

In the case of TUT, convergence has not worked because of the following reasons. The functions of Electronic Resource Centres and I-Centres have not been aligned with those of the libraries. There is a general perception of ERC's and I-Centres as separate places of rest and not necessarily of learning. For instance, the majority of participants in the focus group indicated that they use ERC's and I-Centres for general internet browsing and to visit libraries to use the wireless hotspots during study breaks, or to pass time (see 6.2).

To supplement their current mandates, Electronic Resource Centres (ERC's) or I-Centres at TUT may be useful for teaching and learning as a result of partnership with international institutions using the micro-campus model (see also 4.11.2)Moreover, the relationship between the IT department and the directorate of Teaching and Learning with Technology (TLT) at TUT is not symbiotic. This means that TUT's libraries are unable to improve in technology usage despite the fact that they have a relationship with the IT department. From the qualitative data analysed in Chapter Six (see 6.2 and 6.2.5), it is clear that TUT library could do more to improve its online presence and engage with the millennial user.

Currently, TUT's libraries do not use social media, hence the majority of participants recommended the use of social media. It is clear from this data that the convergence of TUT's libraries with the IT department has not been beneficial to TUT's libraries because of a lack of a common purpose. A common purpose is necessary for the successful implementation of this model. The relationship between TUT's libraries and the IT department needs to be reconfigured going forward.

7.1.1.3 Self-service model

The self-service model has been useful in important sectors of the economy such as banking. It has also been introduced in one form or another in South African academic libraries. For instance, Online Public Access Catalogues (OPACs), and RFID machines are currently used by most academic libraries. Several authors have written about the opportunities and negative effects of the self-service model (see 4.10.3).

The greatest challenge of this model is that users are unable to use the products intended for them. A particular case in point is the recent introduction of Xerox self-service printers and cashiers across all TUT campuses. These printers have also been introduced in TUT's libraries. Due to the complex nature of the user interface, many are unable to use the printers on their own. Although a once-off training was provided to staff by Xerox representatives, contract employees have been employed by Xerox to assist with queries from staff and students. The addition of contract employees comes with additional costs to the host company and its clientele. The other challenge is that these self-service printers and cashiers use the local area network servers of the university.

In Chapter Four (see 4.10.3), Alcock and Millard (2007: 314) indicated that the self-service model is technology mediated and the only humans who experience service are the customers who use the technology. Their optimal performance relies on network connectivity. Every time there is a network connectivity issue or power outage, the printers and cashiers do not work.

7.1.1.4 From closed topic to open topic models

In Chapter Two (see 2.1 and 2.2.8) it was mentioned that the classification system used at TUT has been inherited from the merger of technikons (i.e. Northern Gauteng, Technikon North West, and Technikon Pretoria) established during apartheid. This has also been corroborated by the data in Chapter Six (see 6.1 and 6.1.8g) where the majority of participants indicated that there has been no change of the current classification system used in TUT's libraries.

The open topic model has been of interest in disciplines such as computer science as a direct challenge to the closed topic model such as the DDC (see 4.10.4). This has resulted in the emergence of digital libraries. In recent years scholars, researchers and practitioners interested in the analysis of subjects and systems using historical lenses have questioned the relevance of systems such as the DDC (see also Adler, 2016 in 2.1 and 2.2.8).

The emergence of digital libraries has put the library and information science sector under tremendous pressure to adapt or risk some of their systems losing relevance in a changing world. The indigenous perspective should be prioritized in debates and discussions on the analysis of subjects and classification systems used in TUT's libraries.

7.1.1.5 The instructor-student model

The instructor-student model has been used for teaching and learning in universities for decades. The model is currently being challenged by the introduction of digital tools in the traditional classroom setting (see Baglier and Caswell in 4.10.5).

Whereas data in Chapter Six (see 6.1 and 6.1.8), revealed that the majority of participants believe teaching and learning at TUT is stronger, information literacy has been ranked fourth. This data indicates that the instructor-student model is mostly associated with teaching and learning coordinated by faculty staff, and not necessarily librarians. For instance, the TUT101 module is an information literacy curriculum taught by information literacy librarians. However, the low turnout rates of students in the TUT101 classes at TUT point to some of the weaknesses of the use of the student-instructor model within academic libraries. Academic literacy and information literacy courses at TUT are not aligned. Academic literacy is perceived as the sole responsibility of faculty staff while information literacy is perceived to be the sole responsibility of information literacy librarians (see 2.1, 2.2.7 and 2.2.9).

The disparity between academic literacy and information literacy is made worse by the fact that academic libraries are generally perceived as supporting entities of the broader university (see 6.1 and 6.1.2). A reconfiguration of the relationship between TUT's libraries and the university's academic departments is necessary going forward.

7.1.2 Models for the higher education landscape

The next section critiques models that are used to manage change in higher education locally and internationally.

7.1.2.1 Model of global practice oriented learning

The establishment of TUT in 2004 came as a result of the merger between technikons which were established during apartheid (see 2.1). The model followed in establishing TUT is referred to as global practice-oriented learning (see 4.11.1). This model has been tried and tested on an international stage, notably at the University of Technology, Sydney in Australia. The model's core features are strong research performance and leading engagement with industry and partners, which The University of Technology, Sydney is known for. It is also by far the largest university of technology in Australia based on high enrolment figures.

The recent figures provided by University Ranking by Academic Performance of 2017 indicated that TUT is ranked the number one university of technology in Africa. The indicators used to rank universities by academic performance are the number of articles published, citations, total documents, article impact total, and international collaboration. While TUT is also known for being the biggest university of technology in South Africa based on enrolment figures, the same cannot be said about its libraries for research performance and leading engagement with industry and partners. For instance, data in Chapter Six (see 6.1 and 6.1.10) indicated that participants view the relationship TUT's libraries have with local communities as average.

Also, the majority of participants indicated that invitations to participate in scholarly research from TUT's libraries are scarce. This is evident in the low research output of the library services department in the institutional repository (see also 6.2 and 6.2.4). The introduction of epistemic communities and a library and information science teaching department in TUT's libraries could assist with the challenges of research output and partnerships at a national and international level.

7.1.2.2 The micro-campus model

The central feature of the micro-campus model is the use of ICTs. The challenge with this model is that it was introduced in developed countries where proficiency in the use of ICTs may be higher than in developing countries. The introduction of micro-campuses in developing countries has to consider technological challenges facing the respective countries.

As indicated in earlier sections (see 4.11.2), the convergence of the IT department and TUT's libraries has led to the introduction of ERCs and I-Centres. However, these technological spaces have not been used optimally for learning because users perceive them as resting places often used to pass time (see additional comments about TUT's libraries in 6.2). The other challenge of the micro-campus model may be the importing of teaching and learning material from the country of origin.

As indicated in Chapter One, the student disruptions of 2015 and 2016 were symbolic of a unique type of social conflict. It was argued that this unique type of conflict has less to do with class struggles, but has been overwhelmingly acknowledged by participants that the reason why libraries in general, and academic libraries in particular, are targeted during student protests is because they are places of knowledge (see 6.2 and 6.2.6). Since the student disruptions of 2015 and 2016, there has being a growing call for the decolonization of the university curriculum.

The discourse around decolonization of the university curriculum is therefore relevant to the successful implementation of the micro-campus model. Implementation without a consideration of the growing need for the epistemological legitimization of local indigenous knowledge systems within the more Westernized, Anglo-Saxon and Afrikaner-influenced knowledge systems of contemporary South Africa may have disastrous consequences (see also the proposed model for TUT's libraries in Chapter Seven).

7.1.2.3 The model for branding in higher education

The model for branding of higher education in South Africa elevates internal branding over external branding (see 4.11.3). What is not mentioned in the model is the role that the

academic library could play within institutions of higher learning. For instance, do academic libraries also need to develop some form of branding and how would this assist them to carry out their marketing activities within and outside the university setting? What about the conduct of academic library staff?

Externally, the brand TUT has been around for some time and is well entrenched within society. How it is perceived is a discussion for further research although there is a general acknowledgement that TUT has been associated with some of the most violent student disruptions (see 2.1 and 3.1). This may have implications for the university's branding. However, its internal branding is where the real focus should be. For instance, very little branding exists for TUT's libraries in spite of the fact that marketing forms part of the functions of the libraries and/or job profiles of some staff members. More can be done to improve on the marketing of TUT's libraries to local communities.

7.1.3 Models depicting changes in society's knowledge system

This section deals with models that depict changes in society's knowledge system.

7.1.3.1 Mode 1 model

The model used to organise the university establishment as we know it today is referred to as Mode 1. Core features of this model are strict control of the university by a group of people regarded as experts and the use of peer review mechanisms. These experts include university professors and researchers who determine which problems require scientific investigation (see 4.12.1).

The challenge in the use of this model is that universities tend to narrowly focus on specific areas of research interest in order to encourage the growth and maturity of specific disciplines. Such an approach may be subjective and intended to serve the interests of elite groups within society. These elite groups may be defined along political, economic as well as cultural lines. This may have ramifications for the academic culture of universities and the diffusion of knowledge across society. It may also have implications for the knowledge system of contemporary society.

For instance, the historical involvement of investors and politicians in the establishment of universities in the US in the 19th century has seen the rise and export of the Mode 1 model to developing countries of the world. As a result, many universities across the world have been modelled as such. In South Africa, the academic culture in universities bears the brand of a mixture of international influences from the US, the UK, Europe and locally, those of the Afrikaner (see Le Roux, 2013 in 2.1, 2.2.6 and 2.2.6.1).

The current-perceived narrow focus of TUT's libraries' functions may be linked to the features of strict control within a university environment that specifies what role the libraries should play irrespective of changes in society. The majority of participants in the survey emphasized that TUT's libraries should play a supporting role in addressing social conflict (see 6.1 and 6.1.2).

7.1.3.2 Mode 2 model

The core feature of the Mode 2 model is the diffusion of knowledge across society (see 4.12.2). Nowadays it is difficult to think of the existence of, for instance, library and information sciences without considering applied sciences such as computer science. For instance, computer science is forcing disciplines such as library and information science to adapt in the areas such as classification (see also Mehler and Waltinger, 2009).

The concept of digital libraries is deeply entrenched in computer science fields while the same cannot be said about library and information science (see also the discussion on open ended topics *vis-a –vis* close ended topics in Chapter Four (see 4.10.4). Failure to adapt to changes may render one discipline irrelevant in favour of the disruptive behaviour of another. Such transdisciplinary influences indicate cognitive and social norms of traditional disciplines are being seriously challenged. Challenging these norms gives rise to much-needed collaboration and negotiation between various disciplines for the growth of knowledge in science.

However, the diffusion of knowledge across society may disrupt cognitive and norms of a discipline. The use of alternative quality control mechanisms to peer review in research may lead to a decline in established standards for published works.

7.1.3.3 Triple-helix model

It is important to note that most of the debates around the emergence of the Triple-Helix model have taken shape on an international level with Western European, American, Asian and Latin American nations leading the debate (see 4.12.3). For instance, conferences on Triple-Helix took place in Amsterdam, Netherlands in 1996; New York, United States of America, in 1998; and Rio de Janeiro, Brazil, in 2000. This provided an outlet for discussion of theoretical and empirical issues between policy makers and academic analysts. Since those landmark conferences, literature on the model has grown significantly and continues to grow as researchers in different localized contexts around the world have taken an interest in using Triple-Helix to find solutions to economic and social development issues. Such works include Rodrigues and Melo (2012), Peterka and Singer (2012), Ye *et al* (2013), and Brundin *et al* (2002).

It is not clear how the absence of rhetoric on the Triple-Helix model in South Africa impacts on the local knowledge system, particularly the role that universities ought to play in knowledge production and technology transfer. The model not only emphasizes the relationship between academia, industry and government but also internal transformation within each of its spheres. It would be interesting to find out if the adaptation of the Triple-Helix to the South African context may be a stimulus for transformation.

7.1.3.4 Post Normal Science (PNS) model

The PNS school of thought calls for the democratization of science beyond the boundaries of the university. Its antecedent is the Mode 1 model discussed in Chapter Four (see 4.12.1). PNS' core feature is the advocate of problem-solving strategies that are inclusive of public values and norms, especially those of local indigenous communities and knowledge systems (see 4.12.4). For a definition of indigenous knowledge systems, see 1.8 and 1.9.6.

The challenge of implementing PNS is that most indigenous knowledge systems are generally perceived as non-scientific by scientific communities. Most of the knowledge in indigenous systems is oral and belongs to traditional communities. The norms, traditions and values of traditional communities remain largely implicit in the minds of elders. Access to this type of knowledge rests in the willingness of elders to share. As a result, constant negotiation and persuasion with traditional communities is required for indigenous knowledge to be preserved and recorded for the public good. Once the knowledge is made available, the final hurdle is the epistemological legitimization of local indigenous knowledge in scientific discourse (see also the proposed model for TUT's libraries in Chapter Seven).

The advancement of indigenous knowledge through research may prove difficult without a commitment from universities and local communities. This is also ideal number one in the vision of the TUT Transformation Framework 2017. Data from the survey has indicated that the majority of participants were detractors of the advancement of indigenous knowledge through research in the TUT Transformation Framework 2017 (see 6.1 and 6.1.3).

As indicated in a quotation by Poho (2016), social conflict is highly politicized and reduced to class struggles. Libraries in general and academic libraries in particular, have not featured in the discourse around the transformation of higher education in South Africa. It is not surprising that the majority of participants did not identify TUT's libraries with ideal one of the TUT Transformation Framework. The detraction and passive response from participants also feeds into the challenges relating to the inaccessibility of indigenous knowledge and the slow pace in legitimizing this type of knowledge in scientific discourse. The democratization of indigenous knowledge outside the boundaries of the university might prove problematic without access to research that legitimizes this knowledge in scientific discourse.

7.1.3.5 National Innovation System model

In South Africa, the National Innovation System (see 4.12.5) has been used to shape innovation policies on technology transfer and use since 1994 (see also White Paper on Science and Technology, 1996). The NIS considers the firm or industry, as a leader in innovation. Its main weakness is the prioritization of the natural sciences as the main driver

in national innovation. Since 1994, the NIS model has been used to drive South African policies in the areas of economic development, public policy making and professional practice. The prioritization of the natural sciences has overshadowed the relevance and significance of social science disciplines such as information science (see 7.1 and 7.1.4, 7.1.4.1).

Unlike in the US and German speaking countries, information science has not gained ground in indigenous African language speaking countries. The significance and relevance of information science is not acknowledged in most South African universities. This despite the impact core elements of information science have on social welfare, the economy and science. It is generally acknowledged in German speaking nations that core elements of information science such as data processing, data mining, artificial intelligence, information retrieval and others are the major drivers of modern economies and emerging knowledge societies (Rauch *et al,* 2017 in Gäde *et al*, 2017: 253-254).

Yet such developments are usually led by private companies and the public sector. Similarly, the significance and relevance of information science has not gained ground in South Africa, particularly universities, for the following reasons. Information science is a social science not a natural science. The theory behind South Africa's innovation system model favours hard sciences such as physics and mathematics (see also Chapter Four, section 4.12.5). The enormous impact of information and communications technologies on science and the economy is attributed to private companies such as Microsoft, IBM and others. Questions around cybercrime, cyberwar and the protection of critical infrastructure are attributed to public agencies such as the police and military.

On the contrary, information science is not the core focus of the private and public sectors. Therefore, universities need to take an interest in the scientific discipline of information science for the future development of the South African knowledge society. During the 15th International Symposium of Information Science held in Berlin, Wolfgang G Stock acknowledged the outstanding role of information science in the following quotation:

> As information and knowledge play outstanding roles in the currently emerging knowledge society, information science is - next to computer science – one of the fundamental sciences of the societies of the 21st century (Stock, 2017 in Gäde *et al*, 2017: 255).

The quotation by Stock (2017) in Gäde *et al* (2017) connects with the assertion made in Chapter Four (see 4.7.1) about the knowledge society approach.

Another important observation related to the knowledge society approach was made by Rauch (2017) in Gäde *et al* (2017). According to Rauch (2017) in Gäde *et al* (2017), civil society is a missing link in the new developments. The author emphasized that issues of "privacy, information ethics, intellectual property; the role of the citizen versus private companies and government should be in the centre for information science in Europe, mainly in the German speaking countries". Rauch's statement corroborates the subtle intentions of the title of this study. The intention is to indicate that the academic library does not operate in a vacuum. It is part of a wider system which is made complete with the inclusion of civil society. Within the context of this study, putting a spotlight on civil society may be one way of laying the ground work for the legitimization of local indigenous epistemologies within current knowledge systems of contemporary South Africa.

The intellectual culture has remained the same in spite of the emergence of new models used to solve challenges across various disciplines (see also Graham and Dickinson, 2007). These new models are used to depict changes in society's knowledge system in the second half of the 20th century. However, debates on changes in society's knowledge system have only occurred on an international level. In South Africa, there has been less rhetoric on changes in society's knowledge system, as espoused by Brundin *et al* (2008).

The government and its state organs yield more power in terms of policy direction than academia. The dominant social narrative appears to suggest the direction of the nation state is at the mercy of politicians. Economic and social developmental failures and success are often blamed on and credited to political leadership. The national implementation phase of the proposed model in Chapter Six should assist to address the weaknesses of the South African national innovation system.

7.1.3.6 Finalization in Science model

The core feature of this model is based on case studies of the development of disciplines in the natural sciences (see 4.12.6). Very little scholarly research exists on case studies that depict the implementation of this model in the human and social sciences. There are numerous signs of attempts at finalization in information science. However, such attempts are often overshadowed by the disruptive behaviour of established competing disciplines. Fields such as digital libraries and artificial intelligence are prime examples.

Moreover, finalization requires that a discipline go through certain phases before it can happen. This requires that a discipline matures to a level where society accepts its relevance in the critical areas of economic development, policy development and education. As the reader will discover in Chapter Seven (see 7.1.4.4.1), a social science discipline such as information science is not deeply entrenched in developing countries such as South Africa.

The relevance and significance of information science remains a contentious issue, finalization might prove difficult. The longer it takes for developing countries to acknowledge the relevance and significance of disciplines outside the natural sciences, the less the finalization of those sciences will occur.

7.1.3.7 Academic capitalism model

Although the model of academic capitalism may thrive in a society characterized by free trade and the liberation of strategic sectors of the state, political destabilization in the form of emerging alternative narratives may pose a challenge. For instance, the South African political landscape has seen the emergence of new political parties such as the Economic Freedom Fighters (EFF). Since its formation, the EFF has emerged as an alternative voice to the neo-liberal approach of the ANC. It is generally acknowledged that South Africa is the most unequal society in the world (Beaubien, 2018). There is a rising level of unemployment, poverty and crime.

According to Statistics South Africa (2017) the unemployment rate in South Africa stood at 26.7% in the first quarter of 2017. These social ills are often attributed to the capitalist character of the South African society (Minors, 2017). The system of capitalism has been criticized for perpetuating a capitalist status quo that encourages a growing rift between the rich and the poor African majority.

The 2015 and 2016 student disruptions of South African higher education (see Chapter One) are indicative of the class struggles that confront a democratic South African society based on a capitalist ideology. Therefore, necessary caution should be exercised with the implementation of a model of academic capitalism. Instead some elements of academic capitalism should be adopted in TUT's libraries to circumvent the concerns with funding and budgets cuts.

7.1.3.8 A model of society's knowledge system

As indicated in Chapter Four (see 4.7 and 4.7.1), the model of society's knowledge system focuses mainly on knowledge systems of contemporary societies. Its central feature is the role played by specialized technical knowledge in economic development, public policy making and education. In addition, the model provides a universal blueprint that is not specific about localized contexts (see 4.12.8).

It could be adapted to suit the diverse nature of the South African contemporary knowledge system (see also proposed model in Chapter Seven). However, challenges abound. The dominant knowledge system in South Africa is not as inclusive as it should be. For instance, it could be characterized as contemporary in the sense that it excludes indigenous knowledge systems represented by previously marginalized ethnic groups that are largely black and African.

The dominant knowledge system is also centred on universities as centres of knowledge production. The university's academic culture and publishing activities have been largely influenced by the more Western, Anglo-Saxon and Afrikaner knowledge systems (see also Le Roux, 2013 in 2.2.6 and 2.2.6.1). As a result, the dominant knowledge system has long been

legitimized throughout the era of colonization and apartheid, and is deeply entrenched. An ideal model of society's knowledge system for the case of TUT's libraries should consider the historical injustices of the past against previously marginalized black and African ethnic groups.

7.1.4 The proposed model

The conceptual framework for the adapted model is the theory of the sociology of knowledge, a branch of classical sociology introduced by thinkers such as John H Marx, and Burkart Holzner (see 4.6 and 4.7). The proposed model is an adaptation of the model of society's knowledge system (see 4.12.8). It also builds on the early work by Alfred Schutz and Archie L Dick (see 4.6 and 4.7). The intention of the proposed model for TUT's libraries is to introduce what the researcher refers to as the library project to TUTs transformation agenda (see also section 4.9).

The top half of the proposed model takes the shape of an indigenous board game called *morabaraba* (refer to Figure 7.1). *Morabaraba* is a traditional strategy board game played in South Africa, Botswana and Lesotho. While the game has been likened to the Roman board game *Nine Men's Morris*, it is claimed that *morabaraba* boards carved in rock are dated to be at least 800 years old, which would exclude a European origin. It is popularly played by rural Southern African youth who refer to the counters used in the game as "cows". *Morabaraba* is not only a two-player game since the two players can have an additional one or two people playing the role of "adviser or partner" during the game.

According to Nkopodi and Mosimege (2009) the game was found "to promote spontaneous interaction amongst learners as they communicate their activities to fellow participants in mathematics classrooms". Similarly, the symbolic use of the board in the proposed model may promote interactions and communications that take place between the helices of university, academic library, community, state and private industry. In addition, the symbolic use of the indigenous board game is meant to emphasise the importance of "strategy" and "cows" in the implementation of the proposed model. Strategy may inform policy direction,

while “cows” may refer to the human and intellectual capacity needed to implement the proposed model.

The adapted model proposes a multiple constructionist reality approach to improve on a multiple or shared reality in the understanding of what constitutes knowledge in democratic South Africa. As indicated in Chapter Two (see 2.2.6), South Africa’s early colonial missionary printing and publishing influences, including those of the British colonial and apartheid eras, all contributed to shaping modern contemporary South Africa and therefore its knowledge system.

The addition of democratic South Africa to the colonial past, including the inherent meaning attached to knowledge by previously marginalized racial groups (i.e. Blacks), are indicative of the multiple realities that are currently competing for truth and legitimacy. The student disruptions of 2015 and 2016 are one example of this. These taken-for-granted multiple realities can be seen to represent distinctive knowledge societies that seek truth and legitimacy through language and communication. Based largely on the work of Holzner and Marx (1979), Dick (1982) and others, the adapted model seeks to emphasise the importance of the discourse of language and communication by drawing inspiration from the work of Foucault.

Discourse on the “africanization” and “decolonization” of universities among various role players including students, academics, politicians, the private sector as well as civil society is central to the proposed model. There is a general agreement among these role players that a discourse on “africanization” and “decolonization” is long overdue (Le Grange, 2016).

The discursive use of the terms “africanization” and “decolonization” requires a turn to scientific discourse in order to assign meaning within the confines of the laws of state and institutionalized power (i.e. university libraries). Thus “africanization” and “decolonization” can be formally construed as the epistemological legitimization of indigenous knowledge in the context of this study. A very good source and an example of decolonization is Dick’s (2013) critique of the socio-cultural bias of the cognitive approach used in Ingwersen and Järvelin’s

(2005) nested model of context stratification for information seeking and retrieval (see 3.1.6 and 3.1.7).

In order to legitimise the African indigenous knowledge system among the existing modern knowledge system of contemporary South Africa, the proposed model can be called *Lefa la Tsebo* (see also Figure 7.1). *Lefa la Tsebo* is a Northern *Sotho/Pedi* phrase meaning heritage of knowledge. It can be translated into other local indigenous languages without loss of meaning.

The use of local languages for the proposed model is meant to emphasize the inclusion of local epistemologies as scientific discourse within the more Westernized, Anglo-Saxon and Afrikaner-influenced South African knowledge system.

The proposed model may be characterized as follows:

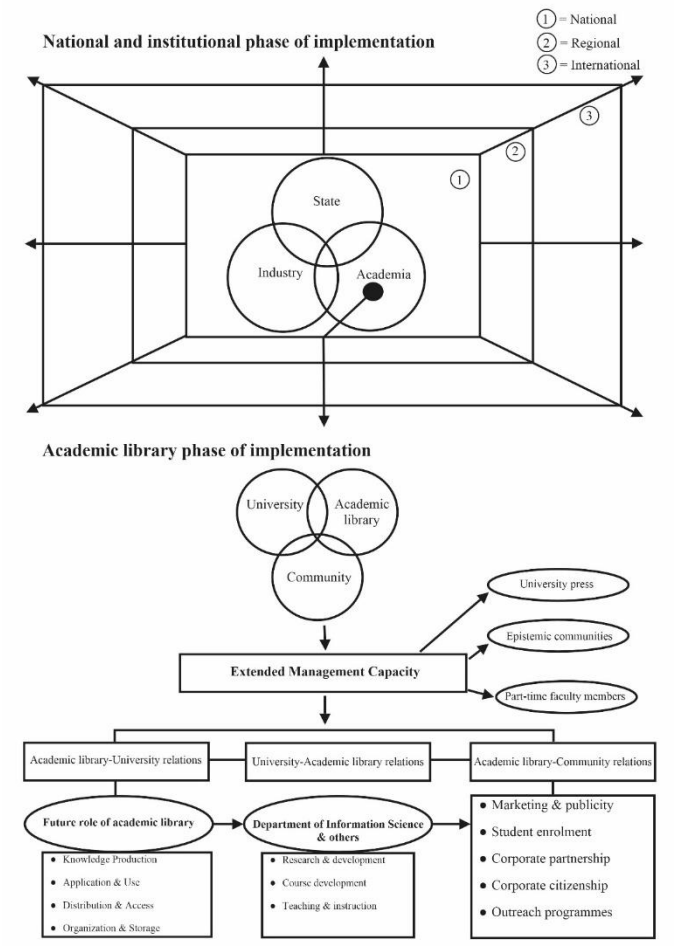


Figure 7. 1: *Lefa la Tsebo*: the proposed model for TUT's libraries (contracted version)

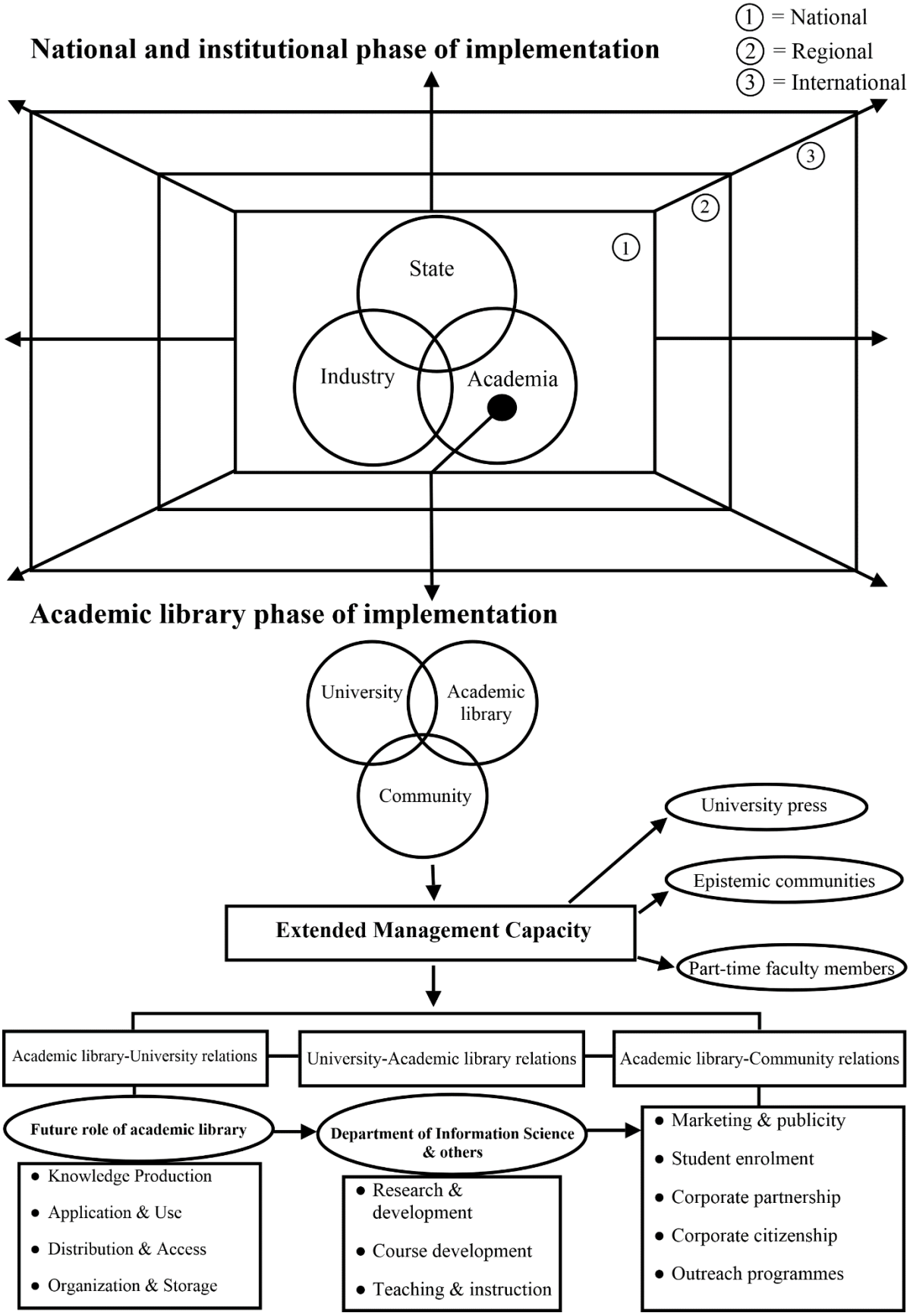


Figure 7. 1: *Lefa la Tsebo*: the proposed model for TUT's libraries (expanded version)

7.1.4.1 The two levels of implementation

The proposed model is two pronged and can be implemented at two levels, from broad to specific. It can be useful at national-institutional and academic library level. Nationally, there is a need for debates around the models used to shape the knowledge system of contemporary South Africa. Importantly, the national context is influenced by regional and international contexts and vice versa. At academic library level, there is a need to think broadly about the position of the academic library in society's knowledge system.

a. The national and institutional level

   The proposed model recognizes that the intellectual culture of a country is crucial for the epistemological legitimization of the indigenous knowledge system. The proposed model rejects the National Innovation System model and embraces an element of Triple-Helix. Triple-Helix contends that academia can play a leading role in innovation. It contends that the reshaping of institutional arrangements may be based on an overlay network of communications and expectations (see Etskowitz and Leydesdorff 1995, 1997, 2000 in section 4.12.3). This network of communication and expectations is characterized as academia-state-industry relations.

   The elevation of academia as leaders in innovation can assist universities and their supporting entities, i.e. academic libraries, on a transformative path. It has been illustrated that knowledge production is one of the processes of society's knowledge system. Universities are centres of knowledge production in contemporary societies (see 4.12.8). However, academic libraries such as those at TUT narrowly focus on knowledge organisation and storage as well as distribution. This narrow focus is a result of the manner in which the relationship between TUT and its libraries is configured.

   Therefore, the re-configuration of the relationship between the state, industry and TUT is a prerequisite for the restructuring of the future role and responsibility of TUT's libraries.

b. The academic library level

Traditionally, academic libraries support universities through the knowledge organised and stored as recorded knowledge. This is also the case with TUT's libraries. However, the historical connection academic libraries have with research libraries problematizes their responsibility and response to social conflict. Also, academic libraries have a direct link with functions relevant in a wider knowledge system (see also Chapter One). The proposed model argues for the reshaping of institutional arrangements between TUT, its libraries and local communities based on the concept of Triple-Helix (see 4.12.3). The reshaped institutional arrangement may be based on a network of communications and expectations characterized herein as university-academic-library-community relations. For institutional re-arrangement to occur, TUT's libraries need to have an extended management capacity.

7.1.4.2 Extended management capacity

Two major challenges currently facing TUT's libraries are budget constraints and the inability to extend their management capacity in order to create third revenue streams. As a mechanism of academic capitalism, extended management capacity may be aligned with the future role of TUT's libraries (see 4.12.7).

The future role may include taking part in other processes of the knowledge system such as knowledge production, application and use. Strategically, extended management capacity may be tied to the recently launched TUT Business Development Unit. It may also be linked to a capacity building programme which assists the LIS community to acquire highly specialized skills for challenging new roles. For instance, LIS Committees and sub-committees may be extended to include epistemic communities (see 1.8.4). The role of epistemic communities would be to take part in international conferences where important global policy making decisions are made.

Epistemic communities would typically be made up of policy analysts, information scientists, and language practitioners. Furthermore, part time library/faculty staff may be included to partner with corporate companies on a project to project basis. Moreover, the introduction of a university press may assist in dealing with scholarly publishing challenges. To avoid

financial hurdles that may come with the introduction of a university press, a phased model should be used.

As indicated in Chapter Two by Le Roux (2013), publishing and university presses determine the academic culture of a university (see 2.2.6.1). The character of the prospective TUT university press may therefore consider the taken-for-granted multiple realities highlighted in section 7.1. The press publishing activities should be managed and determined by the LIS directorate in partnership with the broader university. Extending management capacity can assist TUT's libraries to bring the corporate world into the university by combining state and private partnership investments. It would create new partnerships with an entrepreneurial focus in order to take advantage of the new global knowledge economy led by the academic-capitalist-knowledge-learning regime. New partnerships by TUT's libraries may lead to research and infrastructure investment which can create new products and services marketed to students.

7.1.4.3 The future role of TUT's libraries

The future role of TUT's libraries should include taking part in other processes relevant in a knowledge system. Dick (1982) and others assert that libraries can take part in knowledge production, application and use. The assumption of this future role should not overwrite the current functions of organisation and storage as well distribution but strengthen them. TUT's libraries' participation in the knowledge system should be based on a network of communication and expectations of the two helices (academic-library-university-relations) in partnership with the third helix of community. This future role may be shaped by rhetoric and debates on the inclusion of local epistemologies into the collections of TUT's libraries.

Epistemology (see 1.8) may assist to investigate to what extent TUT's libraries current classification system reveals bias (i.e. language and gender) that should be corrected to maximise access and promote inclusiveness in terms of alternative epistemologies. For example, public administration books at the TUT library in Mbombela are dominated by the English language in spite the fact that the dominant language in Mbombela is SiSwati. The

investigation should be in line with TUT's efforts to develop SiSwati for academic, scientific and communication purposes (see also 6.2.2).

In this study, emphasis is on assumptions about recorded knowledge organised and stored as textbooks and evaluated, and synthesized as documents in TUT's libraries (see also Dick, 2013: 8). Understanding the nature of the knowledge organised, stored and distributed by academic libraries as well as the social context within which it was created is imperative for transformation of the curriculum at TUT. Contrary to the data in Chapter Six (see 6.1.2), TUT's libraries should play a leading role in knowledge production activities aimed at redressing the legacy of colonialism and apartheid in higher education.

a. Knowledge production

   To begin with, the primary basis for partaking in knowledge production activities should be the introduction of research commons across TUT's libraries. Research and infrastructure investment generated through new partnerships highlighted in section 7.1.2 would assist in this regard. In the context of this study, knowledge production in TUT's libraries should take into consideration taken-for-granted multiple realities represented by distinctive knowledge societies fighting for truth and legitimacy through language and communication (see section 7.1).

   Importantly, through the university, TUT's libraries may forge symbiotic relationships with local communities for problem solving strategies considered public knowledge and values, especially those found outside "normal science" such as indigenous knowledge (see also 4.12.4). Gradually, TUT's libraries would embrace their societal responsibility towards the "africanization" and "decolonization" of the university curriculum.

   The process of knowledge production within TUT's libraries would resonate well with the knowledge society approach embraced by contemporary knowledge based economies and may be greatly influenced by the local intellectual climate as well regional and international factors. Expectations between the three helices of academia-state-industry may occur at the national phase of implementation of the proposed model. Priority should

be given to investment into education, research and development in the human and social sciences such as information science.

It is generally acknowledged by key sources of the knowledge society approach (see Machlup, Drucker and UNESCO in 4.7.1), that countries which invest in education, research and development produce specialized technical knowledge. Such specialized technical knowledge is central for the knowledge system of a contemporary country. Implementation at the library phase of the proposed model may occur between the three helices of university-library-community. With the academic library playing the role of mediator, expectations from other role players should be focused on the legitimization of local indigenous epistemologies in scientific discourse. Once legitimized, scholars interested in knowledge production would have the motivation to research and develop local indigenous epistemologies. This may lay a strong foundation for planned application and use of knowledge in society.

b. Knowledge organisation and storage

In order to strengthen the aspect of knowledge organisation and storage (see 2.2.6), TUT's libraries should also focus on organizing their staff into a group of knowers. According to Wilson (1977) knowledge organization is not only about the organization of recorded knowledge, it also the organization of knowers (see Dick, 1982: 19).

As indicated earlier about the role of epistemology, the main task of these groups of knowers would be to investigate the extent to which TUT's libraries' classification systems reveal bias of gender, language, etc. In other words, the organisation and storage aspect should be split between support and academic roles. Support staff (i.e. current Library and Information Services department) should continue to organise and store recorded knowledge in order to support the research, teaching and learning of academic departments and faculties of TUT. Academic staff should be organised into a Department of Information Science. Their primary focus should be research, teaching and learning (see also 7.1.4.4).

c. Knowledge distribution

The impact of technology on knowledge distribution in TUT's libraries is clearly evident. In addition to printed materials, all TUT's libraries subscribe to electronic databases which host various digital resources. Examples of digital resources made available through a shared network between students and staff include journal articles, e-newspapers and e-books. In addition, access to completed electronic dissertations and theses is made through the digital institutional repository. TUT's libraries should explore opportunities that come with the distribution of digital resources over a network. For instance, the open access model could be used to forge partnerships with non-scientific communities as highlighted in 4.12.4. This should create conditions for knowledge that is produced for a purpose (i.e. legitimization of indigenous epistemologies emphasized in 7.1.4.3a).

d. Application and use

The current context and functions of TUT's libraries do not allow for planning on how knowledge is applied and used in society. Once organised and stored, recorded knowledge is distributed to patrons without much consideration for the consequences of its use in society. Instead, the responsibility is outsourced to faculty staff. Similar to knowledge production, its application and use are functions relevant in the wider knowledge system and therefore have a direct link with the core functions of academic libraries.

A poor understanding of the consequences of knowledge utilization problematizes the role of academic libraries and their response to social conflict (see Chapter One). Similarly, expectations from the three helices of university-academic library-community relations should be measured by the epistemological legitimization of indigenous knowledge through scientific discourse. Once legitimized, conditions for planned social change would be created. Both support and academic staff in the LIS community should take part in knowledge production, application and use as organised bodies of knowledge.

7.1.4.4 Department of Information Science and related fields

Expectations created between the three helices highlighted in section 7.1.4.1b should lead to the reshaping of institutional arrangements between the two helices of university-academic

library relations. One of the expectations from the university may be based on the organisation of bodies of knowledge arranged as discipline and related fields. It has been demonstrated that organisation and storage of information goes beyond just the classification of library resources. It is also the organisation of knowers (see Wilson, 1977 in Dick, 1982: 19 and Gibbons et al, 1994 in 4.12.1).

a. Research and development

   Information Science courses are currently not offered at all TUT campuses across the four provinces. The absence of information science courses at TUT can be traced back to the proposal for the restructuring of education in South Africa, May 2002, by former Minister of Education Kader Asmal. The focus on consolidation of faculties during the academic restructuring process resulted in the inclusion of Information Technology on the academic topography.

   This led to the exclusion of disciplines such as library and information science. A task team should be formed to conduct research that will look into the opportunities and risks of introducing a department of information science to TUT. Research and development expectations for the Department of Information Science at TUT should be aligned with the Research Output Policy (Department of Higher Education and Training, 2015) (RSA, 2015).

b. Course development

   TUT's libraries' partnerships with industry partners who develop information science courses should be encouraged (see 4.12.2). Course development should be based on empirical data collected by the task team mentioned in 7.1.4.4 (a). The development of courses should consider financial constraints. As indicated in 7.1.4.2, a phased model could be used to address financial constraints that come with course development.

c. Teaching and instruction

A department of information science at TUT should benefit from public-private-state opportunities that come with the introduction of short learning programmes, national higher certificates, diplomas and post graduate qualifications (see 4.11.2).

7.1.4.4.1 The significance and relevance of Information Science

A question may be asked, what is information science? The answer to such a question does not only lie in providing a definition. It is the duty of information professionals trained in information science to create awareness about the significance and relevance of the discipline. For sources which emphasize the relevance and significance of information science elsewhere in Europe and the Unites States see Borko (1968), Saracevic (1995), Rauch *et al (*2017 in Gäde *et al,* 2017), and Stock (2017) in Gäde *et al* (2017).

When politicians and representatives of private companies talk about the "fourth industrial revolution" in South Africa, they most certainly do not think about information science. There are a lot of debates about the digital divide, artificial intelligence, information society, and knowledge economy among various role players. Such debates exist among academics, including the Executive Management Committee of TUT. Yet these debates are around core sub-disciplines and fields of information science which have been successfully incorporated into computer science and other disciplines.

It is not surprising that departments of information science at some universities have closed down. However, the closure of these departments should not cast a spell of pessimism among information professionals. There are exemplary information departments at prominent South African universities which are flourishing. The University of South Africa and University of Pretoria are examples.

7.1.4.5 Academic-library-Community relations

It has been illustrated that public knowledge is becoming more socially distributed. These developments have been noted by Gibbons *et al* (1994) in Chapter Four (see 4.12.2). The authors argued that "collaboration between knowledge practitioners and researchers

includes a wider more temporary and heterogeneous set of practitioners collaborating on a problem defined in a specific and localized context". It is therefore relevant that communication and expectations of the two helices (academic library-community relations) be centred on indigenous local communities. Importantly, the two helices may expand and/or collapse to form tri-lateral networks with hybrid organisations by overlapping institutional structures. Problem solving strategies in policy formulation may consider and prioritise public values and norms of local indigenous communities (see 4.12.4). The following mechanisms may apply:

a. Marketing and publicity

   The value placed on the role of the student in the proposed model cannot be overemphasized. The idea is to move beyond thinking about the student as a consumer to considering the student as a marketer (see 4.12.7). In addition, the guidelines provided by Hay and Gensen (2008) on branding in higher education are worth noting (see 4.11.3). The proposed model corroborates the guidelines and further emphasizes that TUT's libraries need to engage rigorously in marketing and publicity activities. While the behaviour of staff has to reflect the values and principles of the university, it has to also reflect some sensitivity towards social, political and economic issues in society.

b. Student enrolment

   It may also be the prerogative of TUT's libraries to determine the type of patron that uses their collections. This may also be extended to the type of graduate the university produces.

c. Corporate partnerships and corporate citizenship

   In taking up the entrepreneurial route, TUT's libraries may place information ethics at the centre of their operations. The prevalence in the use of information and communication technologies in the functions of TUT's libraries poses new challenges relating to intellectual property and copyright. The expectation may be that TUT's libraries and the university become more economically, environmentally and socially sustainable; to be

accountable and transparent, inclusive, ethical and more equitable. Public-private partnerships may explore opportunities such as the introduction of short learning programs designed to provide solutions for academia, state, industry and society at large (see 4.12.7).

d. Outreach programmes

Effective academic library-community relations may be strengthened by initiating outreach programmes guided by the principles of corporate citizenship. This may assist academics and non-academics to engage local communities through sponsored and voluntary projects. For instance, the outreach strategy may be aligned with the weeding policy. Outdated stacks of library material gathering dust in store rooms could be donated to community libraries in need of such resources. Such donations must be based on communication and expectations.

7.2 Summary

This chapter critiqued models evaluated in Chapter Four. It also characterized and discussed the proposed model. The model may be referred to as *Lefa la Tsebo. Lefa la Tsebo* is a Northern Sotho phrase which means the heritage of knowledge and may be translated to other local indigenous languages without a loss of meaning. The use of a local language in naming the proposed model is to emphasize the epistemological legitimization of the African indigenous knowledge system among the more Westernized, Anglo-Saxon and Afrikaner knowledge systems in contemporary South Africa. The proposed model may be implemented at the national and academic library phases. At a broader level, it highlights the need for the reshaping of institutional arrangements between the helices of academia, state and industry. At a narrower level, it highlights the need for the reshaping of institutional arrangements between the three helices of university, academic library and community.

Chapter Eight: Findings, Recommendations and Conclusion

Introduction

In Chapter One it was mentioned that following the student disruptions of 2015 and 2016, debates and discussions about the transformation of higher education in South Africa have been highly politicized and reduced to class struggles (see Poho, 2016 and Dahrendorf, 1958). Libraries in general, and academic libraries in particular, have not featured prominently in debates and discussions about transformation in higher education. It was mentioned that the absence of academic libraries in the discourse on transformation in higher education represented a unique type of conflict. It was argued that this unique type of conflict exists for the following reasons: academic libraries traditionally support university faculties and department's research, teaching and learning through the materials they organise and store as recorded knowledge.

Libraries in general, and academic libraries in particular, are often targeted during protest action (see Lor, 2013; Ntsala and Mahlatji, 2016). The targeting of libraries during protest action has been a great concern. There has been a lot of collaboration between the government and LIASA in analysing the root causes of destruction of libraries during protest action. No charges were ever laid against those arrested and therefore the behaviour for such actions remains unknown (see Dick, 2013). Academic libraries have a historical relationship with research libraries (see Kent and Lancour, 1968; Tidmarsh in Saunders, 1968; Drake, 2003; Weiner, 2005; Jolly in Saunders, 1968). In addition, their current operations have a direct link with functions that are relevant in society's knowledge system. As a result libraries in general, and academic libraries in particular, do not operate in a vacuum but are part of a broader society. It was also mentioned that the historical contribution by government, private individuals and multi-national corporations to the establishment of academic libraries make them complex since they serve diverse interests (see 4.1.1, 4.1.2 and 4.1.3).

The literature in Chapter One prompted the researcher to look for a theoretical framework which would be useful in locating the academic library within the broader society. The knowledge system (see 1.8.6) was chosen as a theoretical framework for two reasons: to provide an overarching theory for the study, and to provide justification for how the

researcher wanted the main research question to be answered. Importantly, the section on the information society and the knowledge society approach in Chapter Four also discussed the shortcomings of the knowledge system context as well the benefits South African academic libraries can derive from it. It was found that the knowledge system context was a universal blueprint which needed adaptation to a localized context such as South Africa.

The indigenous perspective provided for by Lillejord and Mashile (2004) was used to emphasise the importance of a localized knowledge system context. The researcher was interested in investigating knowledge systems of contemporary societies using an indigenous lens. Data was sourced through a focused literature review, the case study method, the qualitative evaluation method, documents. This was followed by collecting additional data from a purposive sample from TUT's libraries using an electronic survey, a focus discussion group and interviews (see 5.3).

8.1 Answering the research objectives and questions

The next sections address the research objectives and questions.

8.1.1 Main research objective

The main objective of the study was to examine the context and functions of TUT's libraries using available literature and empirical evidence. The discussion in Chapter Two (see 2.1) addressed the main objective by tracing the origins of TUT's libraries. Also, Chapter Three sketched TUT's responses to transformation and the emergence of conflict (i.e. the 2015 and 2016 student disruptions). Therefore, the main objective of this study was met.

8.1.1.1 Sub-objectives

a. **Compare TUT's libraries with a selection of South African universities and their libraries.** Chapter Two mapped a selection of South African universities and their libraries for comparative reasons. A discussion on two traditional universities in UNISA, Wits and their libraries was provided to understand their history. This was followed by a discussion on DUT, CPUT and TUT since they have a similar library system. This sub objective has also been met.

b. **Evaluate a set of relevant models of society's knowledge system and propose a suitable model.** In Chapter Four it was mentioned that there is evidence of the knowledge system across various disciplines and fields. The discussion highlighted evidence of the knowledge system across various disciplines and fields (see 4.2, 4.3, 4.4, 4.5, 4.6, 4.7). It was mentioned that the way forward was to evaluate a set of models. A self-developed criteria was used to evaluate the models (see 4.9). The following categories of models were evaluated: models for academic library activities, models for the higher education sector and models that depict changes in knowledge systems of contemporary societies (see 4.10, 4.11 and 4.12). This sub objective has also been achieved.

c. **Expand and refine the model of society's knowledge system by creating a proposed model for TUT's libraries.** In section 7.1 a critique of the models evaluated in Chapter Four has been provided with a view to understand the weaknesses and strengths of the models. The critique provided a ground for the selection of elements from the evaluated models deemed relevant and appropriate for the study. The selection of relevant and appropriate elements resulted in the expansion and refinement of model of society's knowledge system (Dick, 1982) proposed in Chapter Seven. The selection of elements from evaluated models for the selection elements were informed by the criteria in section 4.9. Sub objective (c) has also been achieved.

d. **Make recommendations on the policy direction for TUT's libraries.** This study briefly looked into the following policies of TUT's libraries: policy on collection development, acquisitions of information resources, circulation of information resources. This sub – objective has been met. Recommendations on the policy direction for TUT's libraries will follow in the next sections (see also 8.2.1.2).

8.1.2 Sub questions

The following sub questions were answered in support of the main question in section 8.2.2.

a. **What is the particular type of social conflict that problematizes the role of academic libraries?**

As mentioned in Chapter One, academic libraries did not feature prominently during the 2015 and 2016 student disruptions. This was confirmed by the data in sections 6.1.4 and 6.2.1. However, they are often targeted during protest action. Participants stated that the reason why academic libraries are targeted is because they are places of knowledge (see 6.2.6). The Howard College Law Library at the University of Kwa Zulu Natal was provided as an example. It was also mentioned academic libraries traditionally support university faculties and departments in research, teaching and learning through the materials organised and stored as recorded knowledge. The same context also applies to TUT's libraries and their functions.

The historical relationship between academic libraries and research libraries discussed in section 4.1 provides for an understanding of the direct link of academic libraries with functions that are relevant in a knowledge system. In section 2.1, it was mentioned that TUT was established as a result of a merger between technikons (i.e. Northern Gauteng, Technikon North West, and Technikon Pretoria) of the apartheid era. As mentioned in section 8.1.2, much of the academic culture of the apartheid era has been carried into the newly established TUT. This is evident in the publishing practices of scholarly communication (see also Le Roux, 2013 in 2.2.6.1).

The scarcity of documentary evidence on library history adds ambiguity to our understanding of the particular type of conflict that problematizes the role of academic libraries. The data in sections 6.1.2, 6.1.4 and 6.1.7 has confirmed that there is a general acceptance of what Suttie (2005: 285) referred to as the 'institutionality' of academic libraries. As emphasized in the quotation by Suttie (2005) in Chapter Two, the use of the knowledge system theoretical framework in this study has assisted in disclosing the diversity and plurality of academic libraries. Due to their embeddedness, academic libraries accommodate conflicting and competing ideologies. They are therefore caught between acquiescence and resistance.

On the one hand, they need to maintain allegiance to the polarizing forces which determine what passes as knowledge and how this knowledge should be applied in society. On the other

hand, the shift in international relations as well as changes in the global governance system requires of them to encourage collaboration and multilateralism (see also 4.12.2).

b. **How did TUT's libraries respond to the student disruptions of 2015 and 2016?**

In section 6.1.1 (a) it was mentioned that the engagement of TUT's libraries with students during the 2015 and 2016 student disruptions was focused more on announcements of service interruptions. These announcements were in a form of notices placed in and around library buildings. These notices were only visible to students and staff in TUT campuses across the four provinces. It would therefore be difficult for the general public to have access to such announcements. It was also indicated that there was less engagement with students, staff and the general public on transformation in higher education. If there was ever such engagements, discussions and debates which took place might have been sporadic informal conversations which were never recorded.

These findings are confirmed by the data in sections 6.1.2, 6.1.9 and 6.1.10. It was mentioned that participants emphasized TUT's libraries should continue to play a supporting role. This indicated that there was resistance to the idea of TUT's libraries engaging other matters. Also, the responses of participants regarding the engagement of TUT's libraries with the discourse on "'decolonization'" and "'africanization'" were contradictory. Hence the researcher speculated the responses meant that TUT's libraries should remain passive.

Furthermore, it was mentioned that participants emphasized the relationship between TUT's libraries with local communities was both average and poor. The scarcity of annual reports discussed in section 2.1 and the absence of TUT's libraries on social media platforms mentioned in section 6.1.10 sums up the passive and naïve response of TUT's libraries to the student disruptions of 2015 and 2016.

c. **Why are TUT's libraries not taking part in activities related to knowledge production, application and use?**

As indicated in section 2.1, TUT's libraries serve as departmental libraries which support the research, teaching and learning of the university's academic faculties and departments. The

department responsible for this is referred to Library and Information Services. This department oversees the day to day operations in TUT's libraries as well as the staff. The core business of the LIS department is service provision. There is currently no teaching department. The operations of TUT's libraries could therefore be referred to as 'transactional'. The transaction occurs between library users and TUT's libraries. This means that the core functions are arranged solely to deliver service in a form of library materials to faculty staff and students for the purpose of research, teaching and learning.

As mentioned in section 7.1.4.4, the absence of a library and information science teaching department at TUT can be traced back to the early days of the establishment of the university. The strategic decision taken by the then Interim Executive Committee prioritized the Information Technology over Library and Information Science. This decision echoed the intellectual culture of the country at the time (see also 4.12.5). The data analysed in sections 6.1 and 6.2 indicated there was a general agreement among participants that TUT's libraries should not get involved in any matters other that the provision of services.

The absence of a library and information science teaching department at TUT has implications for the LIS community (i.e. staff and management) at TUT. The following should be noted:

- The input of LIS staff to the institution is reduced to practice. The reduction to practice leads to routine work which creates an unquestioning staff. Job position becomes everything while the same cannot be said about research output. Positions are offered on the basis of years of service and not knowledge and skill set. It has been acknowledged that entry level librarian recruitment mechanisms and job advertisements have serious flaws (Moeketsi, 2016).
- The reduction of the Library and Information Services Department to support role for other faculties is to the detriment of the theoretical development and/or maturity of the discipline of Library and Information Science or Information science.
- The current context corroborates the notion of library functions as narrow. This is done at the expense of related functions relevant in a wider knowledge system.

It demotivates library and information services staff with regards lifelong learning, especially towards post graduate studies. Many feel there is no need to study further since the academic topography excludes Library and Information Science or Information Science. The majority of staff with post graduate qualifications trade their skills and knowledge with other universities in spite the fact that TUT pays for their studies.

d. **Which is the most suitable model of society's knowledge system for TUT's libraries?**

As mentioned in section 8.2.2, the proposed model for TUT's libraries in section 6.1.4 consists of elements of some of the models evaluated in sections 4.10, 4.11 and 4.12. These elements have been used to create a refined model for TUT's libraries. The model of society's knowledge system by Dick (1982) is the most suitable for TUT's libraries. However, as mentioned in section 7.1.3.8, the model of society's knowledge system has been designed for knowledge systems of contemporary societies. It was also mentioned that the model was a universal blueprint and not specific to local contexts. Its refinement and adaptation TUT's libraries should consider the historical injustices of the past against previously marginalized groups such as black and Africans. The proposed model for TUT's libraries in section 7.1.4 has been designed with TUT's libraries in mind.

e. **What lessons can be learned from locating TUT's libraries within society's knowledge system more generally?**

The most important lesson to be learnt is that the knowledge system context is useful for a sociological investigation of librarianship. Libraries do not operate in vacuum. They are part of the broader society and therefore influenced by the same polarizing forces which determine what passes as knowledge, how this knowledge is applied and used in society. In addition, the literature reviewed in Chapter Two and Four as well as empirical evidence addressed in Chapter Six indicated that it is important to investigate the academic library using a wider context as opposed to a narrow one.

The plan to transform the TUT's curriculum can be construed as a knowledge production-application-use process that seeks to correct the injustices of the past. It is therefore relevant that academic libraries play an active role since knowledge production is related to the

current functions of TUT's libraries in a wider knowledge system. The more passive the academic library is towards changes taking place in higher education, the more difficult it will be to take responsibility for how the knowledge they organize, store and distribute is used in society.

8.1.2.1 Main research question

Which model of society's knowledge system is best suited as a context to frame TUT's libraries response to social conflict affecting higher education in South Africa? Based on the literature reviewed in Chapter Two and Three, sections 2.1, 3.1 and the responses received from participants in the survey, focus discussion groups and interviews in Chapter Six and the critique of evaluated models in section 7.1, it was concluded in section 8.1.1 that the main objective of the study has been achieved. To answer the main question, elements of models evaluated in Chapter Four were used to adapt and refine a proposed model (see Chapter One). The proposed model consists of elements of Mode 2 (see 4.12.2), Triple Helix (see 4.12.3), Post Normal Science (see 4.12.4), Finalization in Science (see 4.12.6), Academic Capitalism (see 4.12.7) and a model of society's knowledge system (see 4.12.8). It was mentioned in section 7.1.4 that the proposed model has two phases of implementation:

At the national level, the element of Mode 2 considered the effectiveness of government in brokering knowledge produced elsewhere and locally [researcher's emphasis], to be appropriated with its innovation system. This is captured in the quotation by Gibbons *et al* (1992) in section 4.12.2. According to the authors, ingenuity on the part of government is required to navigate between collaboration and competition in the wealth creating process. The prevalence of specialized technical knowledge in knowledge systems of contemporary societies is increasingly bringing into the spotlight the institutional configuration between the state, industry and academia. It has been generally acknowledged that universities are the centres of knowledge production in contemporary societies (see 4.7, 4.12.1, 4.12.2, 4.12.8 and 7.1.3). By extension, institutional configuration has implications for universities and therefore, TUT's libraries.

An element of Mode 2 was chosen because it relates to the political, social and economic dimensions that play out in the interests of supranational institutions such as the EU, and lately, the emerging BRICS bloc as highlighted in section 4.12.2.

Furthermore, the element of Triple-Helix selected for the proposed model encourages the institutional reconfiguration of the relationship between the state, industry and academia. Importantly, it rejects the firm as leader in innovation in contemporary societies (see 4.12.5). At the academic library level, the element of Triple-Helix is also suggested albeit with deviation. Institutional reconfiguration of the relations between university, the academic library and local communities is encouraged. As mentioned in section 6.1.2, participants emphasized TUT's libraries should continue to play a supporting role to the university. The uncertainties regarding the role of TUT's libraries in the university's transformation process have also been confirmed in section 6.2.1.

In addition, the element of Post Normal Science selected advocates for the inclusion of local indigenous community knowledge systems in public policy formulation strategies (see 4.12.4). This is in line with the data collected from participants in section 6.1.10. It also supports the critique about TUT's libraries performance in research and engagement with leading partners and industry (see 7.1.2.1).

Furthermore, an element of Finalization in Science (see 4.12.6) was selected to support the argument that the social and human sciences are equally important for national innovation (see 4.12.6). In section 7.1.4.4.1 it was emphasized that the significance and relevance of information science has not been given the attention it deserves by governments in developing countries such as South Africa. It is therefore relevant that the discipline reaches a stage of finalization in order to contribute to nation building. The emphasis on the inclusion of an information science teaching department in TUT's libraries is a step in the right direction.

Moreover, an element of academic capitalism was selected taking into consideration the concern of financial constraints facing academic libraries around the world (see 4.12.7). In section 4.12.7 it was mentioned that most universities in South Africa had already

incorporated elements of academic capitalism in their daily operations. Notwithstanding the critique of academic capitalism in section 7.1.3.8, its usefulness in encouraging the incorporation of corporate partners into the university to supplement government subsidy is commendable. Its emphasis on promoting an academic capitalist knowledge/learning regime is relevant for the discourse around 'free quality decolonized education' in higher education.

Finally, the model of society's knowledge system was selected because it talks to the theoretical framework chosen for this study (see 4.12.8) and the knowledge society approach discussed in section 4.7.1. It is also useful for a deeper understanding of the processes involved in knowledge systems of contemporary societies. There was also a general agreement that in future, libraries could participate in knowledge production as well as application and use (see 4.7).

It is therefore relevant that TUT's libraries participate in these processes going forward. Importantly, the critique of model of society's knowledge system in section 7.1.3.8 has highlighted that a localized context was necessary. The necessity of a localized context raises questions around the inclusion of local epistemologies in knowledge production processes of a contemporary society such as South Africa. This point is has been confirmed by the data in sections 6.1.3 (a), 6.2.2 and is addressed fully in 7.1.4.

8.2 Recommendations for further research

Based on the several research gaps revealed by the literature, the researcher would like to make the following recommendations for further research:

- In Chapter Two it was mentioned that very little research exists on library history in South Africa. Most of the sources that were found were about public library history more than academic library history (see Lor, 1996; Owens, 2002; Van der Walt, 2004; Brown and others in Suttie, 2006). There is no doubt Suttie's (2006) publication about the history of the University of South Africa and its libraries was helpful. The scarcity of scholarly research on academic libraries in South Africa is a grey area that requires investigation. In addition, the literature reviewed in Chapter Two and Four has revealed that only older

sources pointed to the existence of a knowledge system. The absence of newer sources relating to the location of the academic library within the knowledge system is problematic. It demonstrated that researchers in Africa and South Africa in particular, studied the academic library using a narrower context (see 4.7.1).

It is recommended that library history be included in library and information science curricula.

- The proposed model for TUT's libraries suggested the introduction of a teaching department to supplement the Library and Information Services department at TUT (see 7.1.4). Before this could happen, there has to be an agreement on the approach to be taken in reconfiguring the department and its libraries. There should be an open debate about the appropriate label that will be given to an Information Science teaching, learning and research department (see also 7.1.4.4a). The debate should also be extended to the library and information service community at TUT (i.e. support staff and the management). What we currently have at TUT is a Library and Information Service department without a teaching, learning and research department. This situation is made worse by the fact that the library and information service staff at TUT has been trained in the traditions that reflect the historical development of Library and Information Science or Information Science (see also 8.2.1).

  The researcher recommends that future library and information services summits include debates and discussions on the appropriate label for an information science teaching department.

- In general, there is also a nationwide disagreement on the label of the discipline referred to as Library and Information Science or Information Science in this study. For instance, the researcher has been trained in the tradition of Information Science while other members have been trained in Library Science, Bibliography, Documentation, Library and Information Science, Knowledge Management and other similar fields. Also, the nomenclature differs from university to university in South Africa. This makes for a very

interesting diversity of perspectives and views. Our approaches to researching the challenges facing us might be different. Literature indicates that the abbreviation LIS has a different meaning to the one used at TUT. For instance, the LIS at TUT is oriented towards the services and products supplied by TUT's libraries to users. A very good source that outlines the core concepts in Library and Information Science or Information Science and the level of disagreement is Hjørland (2014).

It is recommended that there should be debates and discussions on the unification of the key concepts which contributed to library and information science. The process of unification should lead to uniformity in the labelling of library and information science across South African universities.

- As stated above, the totality of qualifications held by the Library and Information Service community at TUT reflect the historical development of Library and Information Science or Information Science. Also, the labels used by different universities to refer to Library and Information Science or Information Science reflect a level of disagreement in South Africa. The researcher is not only interested in the label that will be given to the Information Science teaching department at TUT (see 7.1.4.4). A lot of interest is also on the theories, metatheories and paradigms available for use in Library and Information Science or Information Science literature.

  These theories, metatheories and paradigms inform the perspectives and views researchers and students have on the field(s). These perspectives and views influence the approaches and methodologies used to solve challenges (see also 4.7.1). As mentioned in section 7.1.4, this study builds on social constructionist/discourse analytic schools of thought. TUT's libraries are focused on providing information products and services to users. Social epistemological questions such as what type of knowledge is being provided, in which social context is the knowledge produced, what is the role of TUT's libraries in knowledge production; all have relevance given the changes taking place in the South Africa's higher education sector.

The researcher recommends that further research should be conducted into the theoretical foundations of library and information science.

8.2.1 Other recommendations

The following are recommended for national government, institutions of higher learning and TUT's libraries.

8.2.1.1 Recommendations for government and institutions of higher learning

In South Africa, the national innovation system model has been used to guide national innovation and technology transfer policies since 1994 (see 4.12.5). The critique of the National Innovation System model mentioned that the philosophy of the White Paper on Science and Technology 1996 prioritizes the natural sciences over the social and human sciences. It was also mentioned that the prioritization of the natural sciences overshadows the relevance and significance of information science in matters of national interest (see 7.1.3.5).

The national and institutional phase of implementation of the proposed model for TUT's libraries also emphasized reconfiguration between the state, industry and academia. It strongly emphasized the rejection of the National Innovation System model. It was suggested that an element of Triple-Helix should be embraced, especially since universities are centres of knowledge production in contemporary societies (see 4.12.8). Therefore:

- Academia should take the lead in national innovation and not industry as is currently the case (see 4.12.3, 7.1.3.3 and 7.1.4.1a).
- It is also recommended that government acknowledges the relevance and significance of information science in the domains of economic development and policy formulation (see 7.1.4.4.1).
- Epistemic communities made up of policy analysts, information scientists, and language practitioner's etcetera, should be part of supranational institutions such as BRICS (see also 4.12.2). They should also attend local and international conferences where debates on changes in knowledge systems of contemporary societies take place. Their reports should be used to formulate national policies.

- Intellectual property policies should take into consideration the influence of early missionary, colonial printing and publishing practices. The impact these early developments had on the academic culture of universities should inform policy adaptations transformation imperatives (see 2.2.6 and 2.2.6.1).
- The government should implement the recommendations of CHELSA regarding university libraries funding as highlighted in the report by the Heher Commission of Inquiry into Education and Training.

8.2.1.2 Recommendations for TUT's libraries

Generally, changes taking place in society are forcing academic libraries locally and internationally to adapt to a changing higher education landscape. A prime example of the main driver of change in higher education is the student disruptions of 2014 and 2016 (see Chapter One). These changes directly affect the core areas of TUT's libraries operations (see 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6, 2.2.7, 2.2.8, and 2.2.9). Importantly, it has been mentioned in sections 2.2.4, 2.2.5 and 2.2.6 that TUT's libraries policies in the areas of collection development, ordering, acquisition and circulation need adaptation. The literature discussed in Chapter Four has also highlighted TUT's libraries have a historical relationship with research libraries (see 4.1).

It has also been shown that TUT's libraries do not operate in a vacuum but are part of society's knowledge system (see 3.1.2, 4.3, 4.4, 4.5, 4.6 and 4.7). In addition, models evaluated in Chapter 4 have been useful in highlighting solutions researchers use to solve challenges in academic libraries, the higher education landscape and society's knowledge system (see 4.11.1, 4.11.2 and 4.11.3). The literature reviewed in Chapters One, Two and Four has been confirmed by the data collected from participants in sections 6.1 and 6.2. Elements from the models in 4 and their subsequent critique in section 7.1 have been useful in developing a proposed model for TUT's libraries (see 7.1.4). The following are recommended for the policy direction of TUT's libraries:

- Epistemology should be used to chart the future role of TUT's libraries. It should be used to question the assumptions which inform the knowledge contained in their collections, the classification system used to organise the collections, research methodologies used

to find solutions to challenges etcetera (see 1.8.3, 2.2.8, 3.1.7, 4.7.1, 6.2, 7.1.4.3). The use of epistemology has implications for the policy direction of TUT's libraries.

- The collection development policy of TUT's libraries needs to be aligned with TUTs Policy on Language of Teaching, Instruction and Communication (see 2.2.4). The purpose should be to proactively include the indigenous languages identified in TUT's Policy on Language of Teaching, Instruction and Communication into the collections of TUT's libraries. In addition, more indigenous languages should be included in the collections of TUT's libraries based on the criteria of geographical location of TUT's libraries. For confirmation of the support of collection development as an important function see also section 6.1.6a.
- In order to support the adaptation of the collection development policy, the policy on the acquisition of information resources needs to clearly specify the suppliers of information resources for TUT's libraries. In addition to supporting academic departments, the criteria for acquiring information resources should prioritise publishers of indigenous languages and content (see 2.2.5).
- The policy on Information Literacy Training should be aligned with TUTs Policy on Language of Teaching, Instruction and Communication. The curriculum and content of the Information Literacy Content needs to be inclusive of local languages and content.
- Future LIS summits on transformation should put more emphasis the direct relationship between TUT's libraries and functions relevant in a knowledge system. The knowledge system context should be used to investigate TUT's libraries.

8.4 Conclusion

Chapter One has shown that the targeting of libraries during student protest is not a political or class conflict. It represents a unique type of conflict (see 8.1.2a). The mapping of four South African universities and their libraries in Chapter Two has illuminated on the nature of academic libraries. Chapter Three showed the extent to which the functions of TUT libraries are affected by change. It also showed the response of TUT and its libraries to transformation and the emergence of conflict.

The literature in Chapter One, Two and Three prompted the researcher to look for a theoretical framework which would be useful in locating the academic library within the

broader society. The knowledge system was chosen as a theoretical framework for two reasons: to provide an overarching theory for the study, and to provide justification for how the researcher wanted the main research question to be answered (see 8.1.2.1).

Importantly, the section on the information society and the knowledge society approach in Chapter Four has shown that Library and Information Science researchers in South Africa have not investigated academic libraries using the knowledge system context. This lack of interpretation of library and information science trends and phenomena using a theory laden position may point to a general association with a singular epistemological tradition (see also 8.2.1.2).

By taking a social constructionist/discourse analytic and multiple realism position, the study highlighted the shortcomings of library and information science research in South Africa. It also highlighted the shortcomings of the knowledge system context as well the benefits South African academic libraries can derive from it.

Chapter Four has revealed that academic libraries have a historical relationship with research libraries. It has also shown that researchers across the world have sought to solve challenges facing academic libraries, higher education and knowledge systems of contemporary societies.

Chapter Five addressed the blended methods approach that was taken for the case study of TUT's libraries. The additional data collected from participants in Chapter Six, was useful in understanding the context and functions of TUT's libraries. The proposed model for TUT's libraries in Chapter Eight should be used to make policy adaptations in light of changes taking place in the South African higher education sector.

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Appendix 1: Survey Questionnaire

The Academic Library in Society's Knowledge System: a Case of Tshwane University of Technology (TUT)

Survey Flow

Standard: Block 1 (1 Question)
Block: Default Question Block (11 Questions)

Page Break

Start of Block: Block 1

Q1 **Project title: The Academic Library in Society's Knowledge System: a Case of Tshwane University of Technology (TUT)**

TUTREC Ref. # REC/2017/08/008
UPEBIT Ref.# EBIT/135/2017

INFORMED CONSENT FORM

Dear participant
Kindly read through the following to give consent for participating in the study.
PARTICIPATION Your participation in this study is voluntary. It is within your right to participate or pull out of the study without any judgement. You are also free to decline to comment to any of the questions asked should you feel the need to do so.
BENEFITS There are no material benefits for participating in this study. This study will however, assist TUT's libraries make adaptations to policy in light of the changes taking place in society's knowledge system, higher education and academic libraries both locally and internationally.
RISKS There are no significant foreseeable physical risks for everyone who participates in this study. However, there is a risk that you may find some of the questions asked to be sensitive, emotionally discomforting and/or distressing to you. The researcher assures you that the possible risks or discomforts that may be caused by the questions are minimal.
CONFIDENTIALITY The questionnaire was designed with Qualtrics Survey Software. After collection, data will be stored in Qualtrics University of Pretoria server, in a password encrypted electronic environment only accessible to the researcher. Qualtrics is currently used at University of Pretoria and offers a reputable service with a guiding privacy policy. Therefore, your responses will remain anonymous. No one will be able to identify your answers and no one will know you participated. Please feel free to contact me for any further questions.

End of Block: Block 1

Start of Block: Default Question Block

Q2 Generally, libraries are targeted during protest action. Why do think academic libraries are targeted during student protest action in particular?

_____

_____

_____

_____

_____

Q3 How would you rate your experience of TUT's libraries' response to social conflict affecting South African higher education, specifically #Feesmustfall and Rhodesmustfall ?

	Far exceeds expectations (1)	Exceeds expectations (2)	Equals expectations (3)	Short of expectations (4)	Far short of expectations (5)
Engagement with students (6)	○	○	○	○	○
Engagement with general public (7)	○	○	○	○	○
Engagement with academic staff (8)	○	○	○	○	○

Q4 What role should TUT's libraries play to address social conflict (#Feesmustfall, Rhodesmustfall and others in higher education?

- ○ A supporting role (1)
- ○ A leading role (2)
- ○ I see no role. Please specify role below: (3) _____

Q5 TUTs recently adopted Transformation Framework 2017 vision is based on it being conscious of becoming a people's university. What percentage of TUT's libraries activities should be dedicated to the following ideals:

Less				Neutral				More		
0	10	20	30	40	50	60	70	80	90	100

Advance knowledge in all its forms, including indigenous knowledge, through research ()	
Quality service to students, staff, local communities and society ()	
Educate well rounded graduates, appreciative of their culture and contribution to the good of society for 21st century challenges ()	
Develop students as graduate leaders, critical citizens and agents of change. ()	
Fosters freedom, democracy and social and economic justice ()	
Strengthen identity, belonging and inclusion of staff and students ()	
Prioritizes gender redress, and tackles discrimination in all its various forms ()	

Q13 Is the role of TUT's libraries in the Transformation Framework 2017 clearly stated?

- Definitely yes (1)
- Probably yes (2)
- Might or might not (3)
- Probably not (4)
- Definitely not, more comments, please share below: (5)

_____

Q6 How likely are you to recommend TUT's libraries to students and staff at other South African universities?

- ○ 0 (0)
- ○ 1 (1)
- ○ 2 (2)
- ○ 3 (3)
- ○ 4 (4)
- ○ 5 (5)
- ○ 6 (6)
- ○ 7 (7)
- ○ 8 (8)
- ○ 9 (9)
- ○ 10 (10)

Q7 Please rank the following core functions of TUT's libraries in their order of importance for recommendation to students and staff at other South African universities.

_____ Collection development (1)
_____ Information provision (2)
_____ Preservation and scholarly communication (3)
_____ Information literacy (4)
_____ Learning and research spaces (5)
_____ Promotion of the culture of reading (6)

Q8 How satisfied are you with the collections of TUT's libraries?

	Journals (1)	Books (2)	Reference books (3)
Extremely satisfied (1)	○	○	○
Moderately satisfied (2)	○	○	○
Slightly satisfied (3)	○	○	○
Neither satisfied nor dissatisfied (4)	○	○	○
Slightly dissatisfied (5)	○	○	○
Moderately dissatisfied (6)	○	○	○
Extremely dissatisfied, please state the reason below: (7)	○	○	○

Q9 Please rate the following TUT library activities:

	Much stronger (1)	Moderately stronger (2)	Slightly stronger (3)	No change (4)	Slightly weaker (5)	Moderately weaker (6)	Much weaker (7)
Web/Social media presence (1)	○	○	○	○	○	○	○
Library management & research (2)	○	○	○	○	○	○	○
Collection development (3)	○	○	○	○	○	○	○
Ordering, acquisition and circulation (4)	○	○	○	○	○	○	○
OrganisationOrganisation and storage of scholarly communication (5)	○	○	○	○	○	○	○
Academic integrity systems (6)	○	○	○	○	○	○	○
Classification systems (7)	○	○	○	○	○	○	○
Teaching and learning (8)	○	○	○	○	○	○	○

Q10
How best would you describe TUT's libraries engagement with the discourse of 'africanization' and 'decolonization' of the university curriculum?

'Africanization' within the context of decolonization and political independence in higher education is to rid the writing (knowledge) of African history of the prejudices and limitations imposed by traditional colonial and European history

'Decolonization' within the context of higher education means the process of dismantling epistemologies and knowledge systems rooted in colonial, apartheid and Western worldviews and epistemological traditions.

- ○ Extremely clear (1)
- ○ Moderately clear (2)
- ○ Slightly clear (3)
- ○ Neither clear nor unclear (4)
- ○ Slightly unclear (5)
- ○ Moderately unclear (6)
- ○ Extremely unclear, please state the reason: (7)

_____

Q12 How would you describe TUT's libraries current relationship with local communities in terms of resource collections?

- ○ Excellent (1)
- ○ Good (2)
- ○ Average (3)
- ○ Poor (4)
- ○ Terrible, please comment further below: (5)

_____

End of Block: Default Question Block

Appendix 2: Focus Discussion Group Questions

Dear Focus Discussion Group Participant

You are invited to participate in a focus group on **The Academic Library in Society's Knowledge System: a Case of Tshwane University of Technology (TUT).** The research is conducted by Mr Mahlaga Johannes Molepo, a Master of Information Science candidate at the Department of Information Science, University of Pretoria under the supervision of Prof. Archie Leonard Dick. I request at least 40 minutes of your valuable time to participate.

1. How familiar are you with the Tshwane University of Technology (TUT) Transformation Framework?

   Which aspects of the framework are appealing to you and why?

   ---

2. Collection development is a function used by TUT's libraries to make local resources available to users. How inclusive are TUT's libraries collections in terms of content coverage of local languages and culture?

   How important is the inclusion of local languages in the collections of TUT's libraries and why?

   How can TUT's libraries partner with local communities to develop their collections of resources?

   ---
3. A majority of participants in the survey indicated that TUT library's online presence is weaker compared to other university libraries. Which online communication tools would you recommend that TUT's libraries use?

   Which social media platforms do you use and why?

   What is your favourite social media platforms?

   ---
4. How often do you get invitations to participate in scholarly research from TUT's libraries?

   ---
5. Is there anything else you would like to add about TUT's libraries?

   Thank you very much for your participation.

Appendix 3: Interview Schedule

Good day,

[Shake of hands]

My name is Mahlaga Molepo. I am an employee of Tshwane University of Technology (TUT) library based in Mbombela, Mpumalanga province. I am a Master of Information Science candidate at the University of Pretoria. I am conducting interviews to investigate the context and functions of TUT's libraries given the changes taking place in higher education.

I ask for a few minutes of your valuable time for this interview. It won't take more than 10 minutes.

1. Which TUT's libraries have you visited and/or used since you enrolled as a student and why?

   ---
2. Kindly compare the libraries you have visited and/or used at TUT in terms of the following:
   2.1 Web and social media presence

   2.2 Collections covering local languages

   2.3 Engagement with students

   How often did you receive communication from the TUT's libraries and what was the communication about?

   How often did you visit TUT's libraries and why?
   ---

3. Are you familiar with the TUT Transformation Framework?

   Which aspects of the TUT Transformation Framework are interesting to you and why?

   ---
4. How was the engagement of TUT's libraries with local communities in your area and why?
   - Excellent
   - Good
   - Average
   - Poor
   - Terrible

   ---
5. Anything else you would like to add about TUT's libraries?

We have reached the end of our interview. THANK YOU SO MUCH FOR YOUR TIME AND EFFORT. Please feel free to contact me for any further questions that may arise.

Appendix 4: TUT LIS Transformation Summit Program

LIS TRANSFORMATION SUMMIT

28 JUNE 2018

09:30-10:00	Registration and Arrival Tea	
	Session 1 Chair	**Ms R Mhinga**
10:00-10:05	Opening	Ms V Agyei
10:05-10:30	Keynote address	Dr A Sadie
10:30-10:45	Fees Must Fall!?! – Open Access	Ms B Boucher
10:45-11:05	Transforming the Library and Information Services at the Tshwane University of Technology (TUT) through Digital Platforms - Traversing new grounds	Mr J Moeketsi
11:05-11:25	TUTDOR Establishment, Benefits and Challenges	Mr L Maake
11:25:11:40	Comfort break	
	Session 2 Chair	**Ms N Kunene**
11:40-12:00	Implementation of Social Media as a Tool for Bettering Services in Academic Libraries	Ms J Mfete
12:00-12:20	Catching the big fish: How libraries can use social media to reach “techno-savvy” clients	Ms N Chitungo
12:20-12:40	Collection assessment trends from an Information Librarian’s point of view	Ms B Swanepoel
12:40-13:30	Lunch break	
	Session 3 Chair	**Ms M Mashilo**
13:30-13:50	The Ripple Effect: the result of an action	Ms K Schuring
13:50-14:10	The Academic Library in Society’s Knowledge System: a Case of Tshwane University of Technology	Mr J Molepo
	Session 4 Chair	**Ms S Kunene**
14:10-14:40	Question and Answers	
14:40-15:00	Closing remarks	Mr A Mahlangu

Appendix 5: TUT Research Ethics Committee approval letter

Tshwane University of Technology
We empower people

Research Ethics Committee

The TUT Research Ethics Committee is a registered Institutional Review Board (IRB 00005968) with the US Office for Human Research Protections (IORG# 0004997) (Expires 30 Jan 2020). Also, it has Federal Wide Assurance for the Protection of Human Subjects for International Institutions (FWA 00011501) (Expires 22 Jan 2019). In South Africa it is registered with the National Health Research Ethics Council (REC-160509-21).

October 24, 2017

Ref #: REC/2017/08/008
Name: Molepo MJ
Student #: 16402571, UP

Mr MJ Molepo
C/o Prof AL Dick
School of Information Technology
University of Pretoria

Dear Mr Molepo,

Decision: Approval with Comment

Name: Molepo MJ
Project title: *The academic library in society's knowledge system: A case of Tshwane University of Technology*
Qualification: MA Information Science, University of Pretoria
Supervisor: Prof AL Dick, University of Pretoria

Thank you for submitting the revised project documents for ethics clearance by the Research Ethics Committee (REC), Tshwane University of Technology (TUT). In reviewing the documents, the comments and notes below are tabled for your consideration, attention and/or notification:

- **Proposal & Consent Documents**
  - The revised Proposal and Informed Consent Form are in order and duly noted.
  - **Sampling (Section 10.4)**. Kindly clarify the position/identity of the *Community Leaders*, as well as their link to the TUT context.

- **Survey Questionnaire**
  - Kindly provide the TUT REC with the Office 365 link to the final questionnaire that will be distributed to the respondents.

The Research Ethics Committee, Tshwane University of Technology, reviewed the revised project documents at its meeting on October 23, 2017. **Final Approval with Comments** is granted to the study.

The proposed research project may now continue with the proviso that:

1) The researcher/s will conduct the study according to the procedures and methods indicated in the approved proposal, particularly in terms of any undertakings and/or assurances made regarding the confidentiality of the collected data.

2) The proposal will again be submitted to the Committee for prospective ethical clearance if there are any substantial changes from the approved proposal.

3) The researcher/s will act within the parameters of any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study. Strict adherence to the following South African legislation, where applicable, is especially important: Protection of Personal Information Act (Act 4 of 2013), Children's Act (Act 38 of 2005) and the National Health Act (Act 61 of 2003).

4) The current ethics approval expiry date for this project is **October 31, 2020**. No research activities may continue after the ethics approval expiry date. Submission of a duly completed Research Ethics Progress Report (available at: http://www.tut.ac.za/Other/rninew/ResearchEthicsCommittees/Pages/default.aspx) will constitute an application for renewal of REC ethics approval.

Note:
The reference number [top right corner of this communiqué] should be clearly indicated on all forms of communication [e.g. Webmail, E-mail messages, letters] with the intended research participants.

Yours sincerely,

WA HOFFMANN (Prof)
Chairperson: Research Ethics Committee
[TUTRef# 2017=08=008=MolepoMJ]

Appendix 6: University of Pretoria Research Ethics Committee approval letter

Faculty of Engineering, Built Environment and Information Technology

Fakulteit Ingenieurswese, Bou-omgewing en Inligtingtegnologie / Lefapha la Boetšenere, Tikologo ya Kago le Theknolotši ya Tshedimošo

Reference number: EBIT/135/2017 5 March 2018

Ms MJ Molepo
Department of Information Science
University of Pretoria
Pretoria
0028

Dear Ms Molepo

FACULTY COMMITTEE FOR RESEARCH ETHICS AND INTEGRITY

Your recent application to the EBIT Research Ethics Committee refers.

Approval is granted for the application with reference number that appears above.

1. This means that the research project entitled "The academic library in society's knowledge system: A case of Tshwane University of Technology" has been approved as submitted. It is important to note what approval implies. This is expanded on in the points that follow.

2. This approval does not imply that the researcher, student or lecturer is relieved of any accountability in terms of the Code of Ethics for Scholarly Activities of the University of Pretoria, or the Policy and Procedures for Responsible Research of the University of Pretoria. These documents are available on the website of the EBIT Research Ethics Committee.

3. If action is taken beyond the approved application, approval is withdrawn automatically.

4. According to the regulations, any relevant problem arising from the study or research methodology as well as any amendments or changes, must be brought to the attention of the EBIT Research Ethics Office.

5. The Committee must be notified on completion of the project.

The Committee wishes you every success with the research project.

Prof JJ Hanekom
Chair: Faculty Committee for Research Ethics and Integrity
FACULTY OF ENGINEERING, BUILT ENVIRONMENT AND INFORMATION TECHNOLOGY