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**INVESTIGATING THE OPTIMISATION OF SOUTH AFRICAN
UNIVERSITY LIBRARY BUDGETS IN AN AUSTERITY
ENVIRONMENT**

BY

CHIRATIDZO NYADZAI CHATIKOBO

(BLS Hons, MLIS)

Thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy in the Information Studies Programme, School of Social Sciences, College of Humanities, University of KwaZulu-Natal, Pietermaritzburg, South Africa.

2023

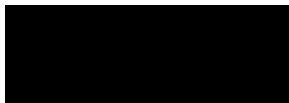
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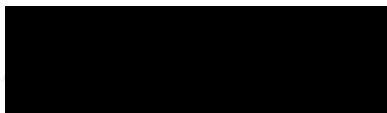
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Supervisor: Prof. R. Hoskins

Signed:



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ABSTRACT

South African Research University Libraries (SARULs) strive to provide essential information resources to support their universities' learning, teaching, research, and community engagement functions. However, the ever-tightening library budgets reduce library resources in South Africa (SA) and worldwide. The existing optimisation strategies appear to be short-term, spontaneous, and unsustainable. There is, therefore, a need to develop long-term sustainable optimisation strategies. The purpose of this study was to investigate the optimisation of South African university library budgets in an austerity environment. In so doing, the following research objectives were pursued: firstly, to determine if austerity budgets were the only problem causing the shrinking of library resources. Secondly, this study sought to establish what optimisation strategies were in place and their sustainability. Thirdly, to investigate if the Theory of Constraints (TOC) could be used successfully to optimise SARULs' budgets in an austerity environment. This study adopted the qualitative research approach and employed in-depth interviews to collect primary data from purposively sampled respondents through WhatsApp, Skype, and Microsoft Teams. The study's target population consisted of 42 respondents selected from six research universities in SA according to the Carnegie Cooperation of New York (CCNY) classification. The universities were Rhodes University (RU), Stellenbosch University (SU), University of Cape Town (UCT), University of KwaZulu-Natal (UKZN), University of Pretoria (UP), and the University of the Witwatersrand (Wits). Data on the reasons for shrinking library resources and optimisation strategies were collected. Thematic content analysis was used to clarify the meaning of the qualitative data. Qualitative data collected were analysed using ATLAS ti.22. The findings of this study revealed that only paid-for resources were shrinking, while there was an information explosion on alternative Open Access (OA) resources for libraries to access. Several reasons for the shrinking of library resources and optimisation strategies were brought to the fore by the librarian and Deputy Vice-Chancellor: Research (DVC:R) respondents. It was of concern that some optimisation strategies were not long-term but aimed at short-term solutions. The study concluded that there was a need to develop long-term, sustainable optimisation strategies that would help strengthen SARULs role as a learning resource centre. The study would contribute to the body of knowledge by recommending policies and practices that would help optimise budgets. This would help decision-makers make informed decisions when supporting libraries with financial and technical assistance. Extending this study to other SA universities with different resources and experiences could be a valuable avenue for future research.

DEDICATION

I dedicate this thesis to my husband, Godhelp, and children Anesu Moses, Tadiwa Godhelp Junior and Tanaka Michael, who loved, supported, and encouraged me throughout my Doctor of Philosophy (PhD) journey. Tanaka Michael, my greatest cheerleader, how I wish you had lived to see this PhD come to pass. YES, I CAN. *“I can do all things through Christ, who strengthened me.” Philippians 4:13.*

To my parents, Aaron and Mirirayi (Masiziba special) Mapanda, my anchor, thank you for sowing the seed.

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This PhD work is by no means the result of my efforts alone. I want to thank my supervisor, Professor Ruth Hoskins, for her unwavering support, guidance, and encouragement throughout this journey.

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LIST OF ABBREVIATIONS AND ACRONYMS

ABB	Activity-Based Budgeting
ACRL	Association of College and Research Libraries
ALA	Article-Level Access
APCs	Article Processing Charges
ARL	Association of Research libraries
ASN	Academic Social Networks
CCNY	Carnegie Cooperation of New York
CHELSA	Council of Higher Education Libraries of South Africa
CLOCKSS	Controlled Lots of Copies Keep Stuff Safe
CPP	Core Plus Peripheral
CRT	Current Reality Tree
DALRO	Dramatic, Artistic and Literary Rights Organisation
DBR	Drum Buffer Rope
DD	Document Delivery
DE	Desirable Effect
DHET	Department of Higher Education and Training
DLT	Digital Library Theory
DVC	Deputy Vice-Chancellor
DVC:R	Deputy Vice-Chancellor: Research
EC	Evaporating Cloud
ELT	Embedded Librarian Theory
ERL	Electronic Resources Librarian
FB	Formula Budgeting
FFS	Five Focusing Steps
FRT	Future Reality Tree
FTEs	Full Time Equivalent
GAELIC	Gauteng and Environs Library Consortium
HTML	Hypertext Markup Language
IB	Incremental Budgeting
ICTs	Information and Communication Technologies
ICT	Information Commons Theory
ICTA	Inductive Thematic Content Analysis

ILL	Interlibrary Loans
IR	Institutional Repositories
JISC	Joint Information Systems Committee
KSU	Kansas State University
KU	University of Kansas
LD/DD	Library Director/Deputy Director
LIASA	Library and Information Association of South Africa
LIS	Library and Information Science
L2.0 T	Library 2.0 Theory
LMS	Library Management System
LOCKSS	Lots of Copies Keep Stuff Safe
MIM	Mobile Instant Messaging
MIR	Manager Information Resources
MIT	Massachusetts Institute of Technology
NASA	National Aeronautics and Space Administration
NCLIS	National Council for Library and Information Services
NEAR	National Electronic Article Repository
NRF	National Research Fund
OA	Open Access
OERs	Open Educational Resources
OSD	Optimisation Strategies Database
PDA	Patron-Driven Acquisition
PDF	Portable Document Format
PhD	Doctor of Philosophy
POOGI	Process of On-Going Improvement
PPV	Pay Per View
PRT	Prerequisite Tree
RIN	Research Information Network
RL	Research Librarians
RLUK	Research Libraries United Kingdom
RU	Rhodes University
SA	South Africa
SANLiC	South African National Library and Information Consortium
SARULS	South African Research University Libraries

SCL	Scholarly Communications Librarian
SCONUL	Society of College, National and University Libraries
SCOAP ³	Sponsoring Consortium for Open Access Publishing in Particle Physics
SEALS	South East Academic Libraries System
SFTAR	Successful Full-Text Article Request
SL	Serials Librarian
SPARC	Scholarly Publishing and Academic Resources Coalition
SSRN	Social Sciences Research Network
STM	Science Technology and Medicine
STT	Strategy and Tactics Tree
SU	Stellenbosch University
TA	Transformative Agreements
TB	Traditional Budgeting
TLT	Traditional Library Theory
TP	Thinking Process
TOC	Theory of Constraints
TOC TP	Theory of Constraints Thinking Process
TT	Transition Tree
UC	California University
UCSF	University of California San Francisco
UCT	University of Cape Town
UDEs	Undesirable Effects
UJ	University of Johannesburg
UK	United Kingdom
UKSG	United Kingdom Serials Group
UKZN	University of KwaZulu-Natal
UP	University of Pretoria
URL	Uniform Resource Locator
US	United States
USA	United States of America
USD	United States Dollar
VAT	Value Added Tax
Wits	University of the Witwatersrand
ZBB	Zero-Based Budgeting

CHAPTER ONE

INTRODUCTION TO THE STUDY

1.0 Introduction

This chapter outlines the study that investigated the optimisation of SA University Library budgets in an austerity environment. The study's background and the research problem statement are provided to contextualise the study. The justification of the study, its contribution to the body of knowledge, research objectives, and questions to be asked were presented. A brief research methodology was given. The theoretical and conceptual framework for the study were also articulated. An explanation for the scope and limitations of the study, as well as validity, reliability, and ethical consideration issues, were provided. The structure of the study and contents for the chapters were included, and a list of works cited, alphabetically arranged by the author (person or corporate), was presented.

1.1 Background to the study

The core function of a university library is to support the university's learning, teaching, research, and community engagement activities. The Hong Kong Polytechnic University envisage the library as:

“the learning hub of the university and a dynamic scholarly gateway, the library strives to facilitate and inspire students and faculty to acquire, create and share knowledge and to excel through education and scholarship” (The Hong Kong Polytechnic University, 2011:1).

Ogunjimi, Bello & Olaniyi (2018) submitted that the primary purpose of a university library is to support teaching, learning and research consistently by providing adequate resources and services in terms of quality, depth, diversity, and currency. In a joint statement, the Committee of Higher Education Libraries of South Africa (CHELSA), Library and Information Association of South Africa (LIASA), National Council for Library and Information Services (NCLIS) and South African National Library and Information Consortium (SANLiC) concur, adding that:

“The provision of scholarly electronic information to the higher education and training system is like the provision of oxygen to the lungs of an athlete. Without a plentiful and fresh supply, there is no way the athlete can compete” (CHELSA et al., 2014:1).

Although the need for a library and its importance in a university environment are not questionable, the conversation around adequate budgeting is problematic. An adequate budget is a prerequisite for an academic library to function optimally. In the United Kingdom (UK), the Great Britain University Grants Committee, report of the Committee of Libraries, known as the Parry report number 267, which was published in 1967, recommended that ideally, a fully-supported university library would require 6% of the total university expenditure (Strauch, 2003:40). Despite the recommendations of this report, Strauch observes that in the UK, library funding as a percentage of university funding has fallen dramatically. It has never reached the 6% ideal. Davis (2012) concurred noting that the percentage had declined to just under 2%, while CIPFA (2023) reported that library funding declined by 24% over the last financial year. As a result, university libraries struggle to acquire new resources and often find it challenging to maintain their current subscriptions.

In the United States of America (USA), Germano notes that “despite the seemingly obvious need for libraries and the role they play in informing a literate populace by supporting education and knowledge creation, libraries continue to receive the budget axe” (Germano, 2011:101). To illustrate this point, Simba Information, an industry market analysis firm, agrees that “academic library budgets are essentially flat and concluded that overall sales of scientific and technical books and journals decreased by 1.6% in 2016” (Bosch, Albee & Henderson, 2018:29). Fitzgerald et al. (2023) in agreement retorted that despite their significance within universities, academic libraries are frequently overlooked and inadequately funded.

In Africa, Ogunjimi, Bello & Olaniyi (2018) recorded that in 1992, the Nigerian National Universities Commission approved 10% of the total university budget for libraries. The 10% was, however short-lived, as it stopped in 2001, and libraries started receiving inadequate budgets despite inflation and resource price increases. Willemse (2005) had earlier submitted that in Africa, the ideal proportion of the total university budget allocated to the library budget was pegged at about 6 to 7%. Willemse recommends that universities spend 6% of the total university budget for libraries if excellent service is required and 5% if generally acceptable levels are required.

Although 6% of the total university budget has been cited as ideal, facts and realities specific to the SA context must be considered. The weakening Rand against major currencies, Value Added Tax (VAT) on digital media starting in 2014, and the 0% fee increase in student fees effective from 2016, characterise the SA environment. With these realities in mind, the 6% might not be appropriate for SA, hence library resources are shrinking due to annual cancellations by the libraries.

The general trend worldwide is that libraries are receiving inadequate budgets. Bangani (2018), Frempong-Kore (2020a), Germano (2011), Griffiths (2019), Harper & Corral (2011), Hoskins (2013), Hussaini (2020) and Strauch (2003) agree that library budgets are not adequate. According to Hoskins (2013:574):

“As the increase in journal publishing costs outstrips many library budgets, cancellation projects have become a routine part of library collection management for universities. Although there has been a growing effort to find a long-term solution to the serials’ crisis, academic libraries continue to depend on serial cancellation projects as a short-term, albeit necessary, response to continuing serials costs. Librarians have been struggling to maintain access to their periodical resources due to shrinking budgets.”

Cancellation projects were, thus, regarded as an austerity measure in response to shrinking budgets. The question now is, what is meant by the term ‘austerity’? *Economicshelp* defines austerity as policies to reduce government spending to try and reduce government budget deficits during a period of weak economic growth (*Economicshelp* [n.d] what is Austerity?). *Investopedia* (n.d) defines austerity as a set of economic policies a government implements to control public sector debt. *Merriam Webster Dictionary* simplifies austerity, stating that it is a situation in which there is not much money and when money is only spent on necessary things (*Merriam Webster Dictionary* [n.d] Austerity).

These definitions have ‘spending cuts’ and ‘challenging economic times’ in common, which is reflected in SARULs, as the universities were continuously reducing their library budgets to fund other areas perceived to be more critical. Strauch (2003) notes that cutting or freezing library budgets has always been seen as an easy option. In addition, academic libraries are vulnerable to changes in the world economy because they rely on highly-priced, globally-sourced information products and depend on expenditure allocations from parent institutions that are heavily dependent on public funding (Harper & Corral, 2011).

1.2 Statement of the problem

The research problem is the shrinking of library resources due to austerity budgets. For libraries to meet their user needs, they need to be able to renew and purchase new subscriptions. Unfortunately, libraries are not buying new resources and are cancelling many resources. This negatively impacts their ability to meet the needs of the university community which they are expected to serve.

As university libraries face budget cuts, resources are shrinking due to the annual cancellations libraries have embarked on (Hoskins, 2009). Due to these cancellations, the university communities thus, access fewer resources needed for teaching, learning, community engagement and research activities. Cancelling library resources has severe repercussions for universities. In the joint press release by CHELSA et al.¹ (2014:1), Laila Vahed, the then Chairperson of the SANLiC board of directors, linked libraries to student performance when she stated that:

“These and other modern library services play a crucial role in addressing the problem of low throughput rates of students at universities. The lack of adequately resourced libraries, especially in historically black universities, is specifically identified as one of the problems that aggravate low graduation numbers”.

Although historically black universities are excluded in this study, Laila Vahed’s observation and linking of libraries to student performance apply to most universities in Africa and abroad. The Society of College, National and University Libraries (SCONUL) agrees with this thinking by noting that quality library resources help attract and retain high academic flyers and contribute to the prestige of an institution (SCONUL, 2016). The quality and depth of library resources also determine the quality of research a university’s academics can produce. Per capita expenditure and use of e-journals are undeniably linked with papers published, numbers of Doctor of Philosophy (PhD) awards, research grants and contracts income (SCONUL, 2016).

According to Hoon (2003), cancellations lead to a general decline of the library’s collection, which, in turn, leads to a weakening in the quality of research and teaching, a drop in the reputation of the institution and its academic staff, difficulties in recruiting academic staff and

¹ CHELSA, LIASA, NCLS and SANLiC

students, and reduced chances of receiving programme accreditation. Due to the cancellation of library resources' impact on the universities, SARULs must find other ways to optimise their budgets. This study unpacked the optimisation strategies that libraries need to adopt to mitigate the impact of the austerity budgets.

1.3 Research objectives and research questions

After considering the history of library budgeting in general and specifically in SA, the identified problem of the shrinking library resources became the focus of this study. The study thus investigated whether austerity budgets are common to all the selected libraries. Were budget cuts the only reason/constraints why library resources were shrinking? What optimisation strategies were in place? Would TOC help, and are these libraries destined for value deficit? The following objectives and research questions guided the study.

1.3.1 Objectives

The objectives of the research were to:

- a. Determine if austerity budgets are the only problems causing the shrinking of library resources.
- b. Establish what optimisation strategies were in place, if any.
- c. Investigate if the TOC could be used successfully in optimising SARULs budgets in an austerity environment.

1.3.2 Questions

The following key questions guided the study:

1. What were the other reasons for shrinking library resources besides austerity budgets?
2. How were optimisation strategies implemented?
3. How useful was TOC in optimising SARULs budgets in an austerity environment?

1.4 Justification and contribution of the study

Hoskins and Stilwell (2011) state that SA university libraries receive funding from the government, student fees and endowments. Hoskins & Stilwell (2011:51) also intimate that these budgets were adequate until the late 1990s:

“In the past, academic libraries had generally received budgets in the range of 6% or more of their institution’s budget. However, as the university evolved and its needs changed, most specifically for computer-related equipment and software, libraries experienced a decline in their share of the overall university budget. By the late 1990s, many academic libraries were receiving as little as 3% of their university’s budget”.

Buchanan & Stilwell (2012) note that university libraries in SA entered a difficult period in their financial history from 2012. One of the most significant developments occurred in 2014 when the SA government introduced VAT on electronic media. According to CHELSA et al. (2014), this was a great mistake, as it contributed to SA Higher Education Libraries losing over 40% of their purchasing power.

October 2015 saw students from all major SA universities leading the #feesmustfall protests. The protests culminated in an estimated 15,000 students descending on the Union Buildings (the official seat of the SA government) in Pretoria, demanding that the government address their concerns (Svicevic, 2015). The then President, Jacob Zuma, met with the student leaders and announced a 0% increase for 2016. For academic libraries, a 0% increase in student fees meant further budget reductions (Wild, 2016). According to Wild, library budgets were casualties of the necessary belt-tightening, and this situation was exacerbated by adverse currency fluctuations, which depreciated the value of these budgets even more. The Rand also weakened against major currencies, compromising the SA libraries’ ability to perform their core function. Gwenda Thomas, the then UCT Director of Libraries, illustrated this in Wild’s (2016:1) article:

“Our planning was done at R12.50 to the dollar for 2016, but the Rand’s depreciation meant that, when we paid the invoice, we paid at R16 to R17 to the dollar and R21 to the pound. The variant in what was budgeted for and what libraries will now pay is going to be huge. Universities will have no choice but to cut library budgets even further. Its impact on our researchers, teachers and students is quite worrying”.

All the above factors have contributed to austerity budgets in academic libraries. This is not unique to SA. In the USA, Germano (2011:100) states that libraries are “seeing unprecedented levels of budget cuts”. Germano (2011) posited that:

“In order for libraries to survive the economic downturn and austerity measures put in place by government budgets, they need to rethink the role, purpose and benefits of

library marketing in favour of a more sophisticated approach that conveys the unique value of their library and its offering to their specific user population”.

Austerity budgets seem to be here to stay, and they are not a new phenomenon. To demonstrate that the problem of budgets has been around since the beginning of the last century, Strauch (2003:40) reported that in 1927, the Association of American Libraries report noted that “libraries are suffering because of the increasing volume of publications and rapidly rising prices”, while Somers (1988:177) remarked that:

“materials budgets are in shambles as a result of last year's dramatic price increases, particularly for foreign periodicals libraries which collect heavily in foreign publications paid large increases for them and for titles published by houses with production facilities in Europe and with distribution offices in both the United States and Europe, increase attributed to the adverse effects on the exchange rate”.

Klain & Shoham (2017:3) agree and add that recently, inadequate budgets have become noticeable due to the “increasing number of interdisciplinary studies, which, because they often require collaborations between members of different faculties, are significantly more diverse and costly”.

Publishers are also not being helpful, as their pricing models remain legitimate concerns. Busby (2017:86) observes that the “common belief is that customers can negotiate anything in their annual subscription renewal contracts except for price.” Astrid Söderbergh Widding, President of Stockholm University, concurred and reported that the rising scientific information expenses are straining university budgets worldwide. At the same time, publishers operate on high-profit margins (Wentzel, 2018). Librarians need to stop complaining about the budget cuts and start applying their minds to finding a lasting solution to save their profession from being rendered irrelevant.

The librarian's mindset needs to change. They need to think about optimisation, which Bhattarai (2022) simply defined as a process of minimising costs. If nothing is done in terms of optimising the available budgets, the libraries will “face a value deficit in terms of the perception and acknowledgement of their intrinsic worth. This library value deficit leaves the value of librarians questionable as well” (Germano, 2011:5).

The reason for choosing this topic was to investigate how libraries are navigating this problematic space, continuing to be relevant, and meeting their goals regarding their core functions. Premising this research on the notion that austerity budgets are here to stay, at least for the foreseeable future, the researcher demonstrated how librarians optimised their budgets. This study, thus, aimed at contributing to the four primary categories of knowledge, namely, the scholarship of discovery, integration, application, and teaching (Boshier, 2009; Boyer, 1990; Fincher & Work, 2006; Shaturaev, 2022). According to Ramirez et al. (2022), each category contributes to academia and society differently. However, Boshier (2009) had earlier remarked that the categories are not discrete and do not occur in a predictable order as they overlap and interact. The study's actual contribution will be articulated in detail in Chapter Seven. Regarding this topic, Harper & Corral (2011:114) believe that "financial constraints seemed to be acting as a catalyst for other developments." Was this what was happening in SA? The current study sought to unpack this.

The literature reviewed could not identify studies on the use of the TOC in SARULs in other libraries in SA or worldwide. Many studies on applying TOC were done in manufacturing and some service environments, but none in libraries. This study explored how the SARULs managed their budgets in the austerity environment and the applicability of TOC. The study, therefore, added its voice to previous studies in the field, thereby contributing to much-needed research on this problem. The results determined the applicability of TOC as a working framework for managing and optimizing library budgets.

1.5 Theoretical and conceptual framework

This section provides the principal theories upon which the study was constructed.

1.5.1 Theories

Theories related to library services are continually adapting to broader socio-economic and technological development trends within society (Kwanya, Stilwell & Underwood, 2011). These theories show that library services have evolved from physical buildings with stacks of books and journals to physical spaces with computers for accessing digital resources (Baohua, Xiaoyan & Fei, 2002; Bell & Shank, 2004; Cowgill, Beam & Wess, 2001; Farkas, 2005; García-Crespo et al., 2011; Leach & Tribble, 1993; Walker, 2003). Library budgeting theories

have also moved from traditional budgeting (TB) to Activity Based Budgeting (ABB), Zero Based Budgeting (ZBB) and Formula Budgeting (FB), as these were regarded as suitable theories for the highly volatile economic environment (Cooper & Kaplan, 1998; Linn, 2007; Prentice, 1996; Ross & Technical Information Service, 2008; Sabela, 2012; Steven, 2007; Zach, 2002). The researcher observed that despite all these changing library and budgeting theories, library resources continued to shrink. Therefore, there was a need to introduce a management theory to address the problem effectively.

The study sought to investigate if TOC could provide an optimisation solution that excludes cancellations. TOC is a management theory that focuses on goal achievement and seeks to understand “the underlying cause-effect relationships that are responsible for an organisation’s performance” (Reid, 2007:209).

1.5.2 Conceptual framework

Resource cancellations have been the solution for budget constraints for years. This study sought to identify other solutions and constraints if budget is not the only constraint. TOC demands that organisations think about their problems and their solutions, goals and objectives, policies, procedures and measures in a different way. Mabin & Balderstone (2020) describe TOC as involving a fundamental paradigm shift. It was envisaged that this study, using the TOC, would help foreground other possible solutions.

TOC concentrates on constraints, which Kohli & Gupta (2010) and Mishra & Palo (2014) describe as the chain’s weakest link. TOC was developed by Eliyahu Goldratt and introduced in 1984 (Knaggs, 2013). According to Chakravorty & Atwater (1994), TOC is an approach to business that focuses on achieving that business's goal. Chakravorty & Atwater (1994), Goldratt (1990), Knaggs (2013), Noreen, Smith & Mackey (1995) and Pophaley & Vyas (2010) define a constraint as whatever restricts business performance relative to its goal. As alluded to earlier, libraries have identified austerity budgets as their constraint, limiting their ability to achieve their goal of providing resources to their library users.

Although TOC started as a manufacturing methodology, successful application studies were seen in administrative services (Knaggs, 2013; Mishra & Palo, 2014), small business (Kohli & Gupta, 2010), banking (Reid, 2007) and Habitat for Humanity, Pretoria Academic Hospital,

British National Health Service, United Nations, National Aeronautics and Space Administration (NASA), United States (US) Department of Defense (Air Force, Marine Corps, and Navy), and the Israeli Air Force have all successfully employed TOC solutions (Watson, Blackstone & Gardiner, 2007). According to Watson, Blackstone & Gardiner (2007), the successful application of TOC was publicly disclosed by 3M, Amazon, Boeing, Delta Airlines, Ford Motor Company, General Electric, General Motors, and Lucent Technologies. Watson, Blackstone & Gardiner (2007) reported that several companies were unwilling to disclose improvements for competitive reasons. Umble, Umble & Murakami (2006) documented that as of 2006, a total of 81 companies had integrated TOC into their operations. Among these, 62 were US businesses and 19 from the United Kingdom (UK), Ireland, Germany, Canada, Mexico, SA, Israel, Venezuela, Uruguay, and India. The success of TOC does not go without criticism, as Balakrishnan, Cheng & Trietsch (2008) argue that TOC is not anything new and that TOC's overemphasising and oversimplifying issues can lead to ignoring other important issues, and this can be counterproductive. They, however, note that although weaknesses exist in TOC, it is important to note and emulate its strong points.

There is a need to try TOC in the SA libraries to try and solve the shrinking of library resources. SA libraries' budgets are being cut, as reported by SANLiC in its 2017 Annual Report (SANLiC, 2017). This study applied TOC to SARULs, taking cognisant of Kohli & Gupta's (2010:38) observation that "application of TOC in the service sector are comparatively restricted" as only a few scholar studies confirmed improved performance. Knaggs (2013) acknowledges that lack of process visibility in an administrative/service environment was generally recognised as one significant reason it was more challenging to implement TOC, while Reid (2007) notes that TOC application to a service sector was not easy. Reid (2007) observes that for-profit businesses stress achieving financial targets as their goal, while in service sectors, they aim to exceed customer service expectations.

However, Siha (1999:255) had balanced these arguments earlier by noting that although there are apparent differences between manufacturing and service companies, "there are similarities that make some management techniques usable in either environment." Therefore, applying TOC principles to service organisations may require modifications (Siha, 1999). However, no changes were made in this study. TOC tools were used to identify constraints other than austerity budgets and optimisation strategies that exclude resource cancellations. It was

envisaged that the success of the TOC application would be in stopping resource cancellations and in availing user access to needed library resources.

Cox & Schleier (2010) note that TOC can be summarised by one word - focus. According to Srikanth & Robertson (1995), TOC focuses on change at three levels (the 3Ms): the organisation's mindset, the measures that drive the organisation, and the methods employed. The five focusing steps were used in this study to assist with focusing and as a guide to do what is necessary. Reid (2007) notes the TOC's five focusing steps, which are:

1. Identify the primary constraints of the system;
2. Decide how to exploit the constraints;
3. Subordinate all the other actions to exploit the constraints;
4. Determine if it is necessary to elevate the constraint; and,
5. If a constraint is broken in the previous steps, return to the first step and repeat the process.

Reid (2007) posits that the five steps were developed to ensure that management directs attention to what is essential to successful system performance, namely, improving the system constraint's performance. The study followed these steps to ascertain if they would help provide insights into optimizing the current austerity budgets.

In this study, the austerity budget is the identified constraint. Knaggs (2013:13) observes that TOC is the “unrelenting focus on constraint identification and alleviation that drives a business toward success.” Knaggs adds that once the most significant constraint is removed, another constraint is automatically picked, and this cycle continues until the goal is achieved. Goldratt (1999) states that there is a need to implement a process of ongoing improvement, where change is not an exception but, rather, the norm. According to Chakravorty & Atwater (1994:10), “the essence of TOC is to identify these constraints apriori rather than retrospectively and then use the information to develop a strategy to give the company a competitive edge.” This might be helpful in the SARULs as budgets might not be the only constraint.

1.6 Research methodology

Mavetera (2012) observes that the philosophical nature of a research problem dictates the research approach and methodology that will be followed. This study aims to determine if austerity budgets are the only problem causing the shrinking of library resources and to explore

what libraries are doing to mitigate the problems so as to enable their library users to have continuous access to resources. TOC's five-step-focusing process for constraint management was applied to see its usefulness in libraries.

There are two main approaches to research methodologies, which are qualitative and quantitative (Bryman, 2016; Creswell, 1994). However, Creswell & Creswell (2018), Du Plooy-Cilliers, Davis & Bezuidenhout (2014) and Kumar (2014) add a third method, the mixed method, which they report as residing in the middle of this continuum by incorporating elements of both qualitative and quantitative approaches. The quantitative method is statistics-based and is aimed at large populations. It involves asking questions that can be answered in numbers. Quantitative research normally uses questionnaires, surveys, and experiments as research tools for data collection, and the results will be generalised. According to DeFranzo (2011), the quantitative approach involves measuring and quantifying issues by creating numerical data or data that can be converted into meaningful statistics. This method measures attitudes, opinions, behaviours, and other explicitly defined variables.

The qualitative method is description-based and aimed at a small population. It is exploratory research used to understand underlying reasons, opinions and motivations. It provides deeper insights into the problem. Qualitative data collection research tools are usually unstructured or semi-structured individual or group interviews.

A qualitative approach was used for this study, although some studies on library funding and resource cancellations used a quantitative approach (Blake & Meadows, 1984; Hoskins, 2009; Hoskins & Stilwell, 2010, 2011; Sweeney, 1999; and Willemse, 2005) as will be demonstrated in Chapter Two and Chapter Three. The researcher was able to conduct detailed interviews by employing a qualitative approach, which allowed further probing of the respondents. This would not be possible using a quantitative method. Therefore, this approach provided more insights into the research problem. Myers (1997:3) reckons that “if there was one thing which distinguished humans from the natural world, it was the human being’s ability to talk.” Talking was relevant to this study as it helped illuminate the issues experienced by the people active in the research library environments. The issues documented were based on reality, not perceptions, an aspect that was important for the validity and reliability of the study.

Semi-structured WhatsApp, Skype and Microsoft (MS) Teams interviews were conducted with the DVC:R, Library Directors (LD)/Deputy Directors, Manager Information Resources (MIR), Electronic Resources Librarians (ERL), Research Librarians (RL), Serials Librarians (SR) and Scholarly Communications librarians (SCL) in the selected libraries. Chapter Four will discuss the population under consideration, the methods employed for data collection, and the strategy adopted for data analysis.

1.7 Scope, delimitations, validity and reliability of the study

This section discusses the study's scope, delimitations, validity and reliability.

1.7.1 Scope and delimitations

This study was delimited to the six research universities in SA according to the CCNY classification (University of Pretoria, 2008). In 2003, CCNY started funding six universities in SA that were identified as research universities. Research conducted at these universities informs their curriculum and teaching programmes. These were the UCT, Wits, UKZN, UP, SU, and RU. The study concentrated only on these since they have research resources that were introduced through CCNY funding. The libraries then took over when the funding stopped. The reason for choosing these university libraries was to ensure an unbiased comparison in terms of resource collection.

The TOC thinking process and the five focusing steps were the only concepts used in this study. Chapter Two will discuss the selection of concepts and how they were used.

1.7.2 Validity and reliability

The study sought to understand how participants make sense of their reality. Merriam & Tisdell (2015) observe that reality is holistic, ever-changing, and not a single or fixed phenomenon. The validity and reliability of this study were achieved by triangulation of multiple data collection methods. Here, the researcher checked what was said in interviews against what was contained in the participating libraries' annual reports and other relevant documents. Merriam & Tisdell (2015) assert that triangulation is a powerful strategy for increasing a research's credibility or internal validity. The researcher pretested the interview schedule at the University of Johannesburg (UJ). UJ was not participating in this study but has a similar population to the

participating libraries. This pretest helped to confirm that the interviewees understood and interpreted the research questions as expected by the researcher. This legitimised the questions and expected responses and confirmed the questions' reliability in soliciting the required information. Results from the pretest and the actual study were compared to verify validity and reliability.

1.8 Ethical considerations

This study adhered to the UKZN ethics policy, which underpins all research to guiding principles of honesty and integrity, safe and responsible methods and fairness and equity for the participants (*UKZN Research Policy V: Research Ethics, 2007*). Participation in WhatsApp, Skype and MS Teams interviews was voluntary, and participant responses were confidential. Respondents were advised that they were participating in a research study in line with Du Plooy-Cilliers, Davis & Bezuidenhout's (2014) advice, and that participation is voluntary, and they have a right to withdraw at any time. Participants were asked to complete a consent form before participation. For confidentiality purposes, data collected were put into categories so that participants would not be referred to as individuals, thereby maintaining anonymity.

1.9 Structure of the study

This study had seven chapters structured as shown in Table 1.1 below:

Table 1.1: Structure of thesis

Chapter	Content
Chapter One	Introduction: Gave the general background, the research problem and objectives, brief theoretical and conceptual frameworks, methodology, validity and reliability, scope and limitations of the study, ethical considerations, and the structure of the whole study.
Chapter Two	Theoretical framework: Provided a detailed theoretical and conceptual framework underpinning the study.
Chapter Three	Literature review: Discussed literature relevant to the study.
Chapter Four	Methodology: Explained the research methodology used in the study.
Chapter Five	Presentation of research results: Described/reported and presented the results in narrative/written and visual/graphs formats.
Chapter Six	Interpretation of results: Gave the meaning of the results.
Chapter Seven	Summary, conclusions and recommendations: Discussed the conclusions and recommendations and the implications of the study's findings.
List of works cited	Showed a list of all the works cited in the study. These were listed alphabetically by author. While many referencing styles and guidelines exist, this study used the APA 6 th edition citation and referencing style.
Appendices	Showed tables, letters, interview guides, checklists and other documents that support the text. These are at the end of the thesis.

1.10 Summary of the chapter

The chapter focused on foregrounding the study. The necessity of the study was articulated in the background, as well as the statement of the research problem, the justification and the study's contribution to research, research objectives and questions to be asked. The methodology, theoretical and conceptual framework, scope and limitations, validity and reliability sections briefly presented how the study was conducted. All the research processes were done within the UKZN ethical policy's confirmation. Optimisation strategies were looked at through the TOC lenses. The following chapter (Chapter Two) details the theoretical and conceptual framework, where TOC was introduced in the library environment, particularly SARULs.

CHAPTER TWO

THEORETICAL FRAMEWORK

2.0 Introduction

This chapter provided insights into the study's theoretical framework. According to Stewart (2011), research has multiple perspectives, and a researcher cannot focus on all viewpoints simultaneously. Therefore, there was a need for a logical structure, a theoretical framework (broader) or conceptual (specific). The theoretical framework ensured that the study remained focused on the phenomenon studied.

In this chapter, literature was reviewed on library services and budgeting theories to demonstrate the trajectory libraries take in their efforts to optimise their budgets. This study was premised on the thinking that changes in library services and budgeting theories have failed to bring significant changes to optimising library budgets. TOC, a management theory selected to inform this study, was discussed in detail. The study concentrated on the Five Focusing Steps (FFS) and the Thinking Process (TP) to ascertain if following these processes would help optimise library budgets. Emphasis was placed on the TOC 3M: mindset, measures, and methods. The conceptual framework was discussed, and a conceptual map with variables that informed the study was clearly labelled. The chapter ended with an outline of the disadvantages of the TOC.

2.1 Theoretical and conceptual framework

Du Plooy-Cilliers, Davis & Bezuidenhout (2014:55) define a theoretical framework as a "specific collection of thoughts and theories that relate to the phenomenon one chooses to investigate. It is a conceptual starting point and the frame of the research." Merriam (2009) describes a theoretical framework as a structure, the scaffolding or frame of a study. Ravitch & Carl (2016) understand a theoretical framework as a guide, while Sinclair (2007) equates it to a map or a travel plan. Maxwell (2013) opines that a theoretical framework is a spotlight that illuminates what one sees. The theoretical framework can, thus, help draw the researcher's attention to events and shed light on unnoticed or misunderstood relationships. However, Maxwell (2013:50) cautions that "a theory that brightly illuminates one area will leave other areas in darkness: no theory can illuminate everything." All these scholars mentioned above

saw a theoretical framework as a boundary setter and direction giver. Imenda (2014) concurs and states that research without a theoretical framework lacks accurate direction in the search for appropriate literature and scholarly discussions. This study, thus, provided a theoretical framework to guide on which literature to include or exclude.

However, the conceptual framework provided the researchers' view of this study. The conceptual framework explains the natural progression of the phenomenon to be studied (Adom, Hussein & Agyem, 2018). Maxwell (2013) had earlier observed that a conceptual framework refers to a researcher's original ideas and beliefs about the phenomena studied. A conceptual framework is constructed/built by the researcher and not something that exists already. According to Kumar (2014), Merriam (1998) and Miles & Huberman (1994), a conceptual framework comes from a theoretical framework and concentrates on one section of the theoretical framework, which forms the basis of the research. Ngulube, Mathipa & Gumbo (2015:49) summarise the importance of both theoretical and conceptual frameworks in the study as "the golden thread running through good research informing the research questions, methodology and data analysis."

Theories in quantitative research are at the start of the study to test or verify the theory (Creswell & Creswell, 2018; Ngulube, Mathipa, & Gumbo, 2015). In qualitative research, theories are used at the start or end of the study (Bryman, 2016; Creswell, 2009). Creswell (2014) constructed another dimension where the researcher can decide if a theoretical framework can be included in a qualitative research study, making it a choice that a researcher can make. Merriam (2009), however, had earlier disagreed with the absence of a theoretical framework, inferring that it is difficult to envisage a study without a theoretical or conceptual framework as the researcher would not know what to do in researching without some theoretical framework to guide the search. This study started with the theory, not to test or verify the theory but to guide the study. Beginning with the theory aligns with Creswell & Creswell (2018) and Ngulube, Mathipa & Gumbo (2015). They observe that presenting the theory at the beginning of a study provides an overall orientating lens in qualitative research. The theory, thus, becomes a transformative perspective that shaped the type of questions asked, informed how data were collected and analysed, and provided a call for action or change.

When the SARULs faced budget cuts, they became proactive. Kwanya, Stilwell & Underwood (2011) note that library services and budgeting theories changed to keep up with the austerity

environment. Library service theories were "continuously evolving along with general socio-economic and technological development patterns in society" (Kwanya, Stilwell & Underwood, 2011:145). According to Kwanya, Stilwell & Underwood (2011), librarians needed to select a theory that accommodated the comprehensive characterization of their user communities and contexts. Austerity measures due to shrinking budgets characterise the SARULs context. Therefore, this current study will discuss some of the well-known library service and budgeting theories employed by SARULs. The library theories are Traditional Library Theory (TLT), Embedded Librarian Theory (ELT), Digital Library Theory (DLT), Information Commons Theory (ICT), and Library 2.0 Theory (L2.0 T). Budget theories discussed are TB /Incremental line-item budgeting (IB), ABB, ZBB and FB.

2.1.1 Library service theories

TLT is the oldest library services theory emphasising "effective management of the library catalogue and physical collection, earning it the title Acquire-Catalogue-Circulate model" (Kwanya, Stilwell & Underwood, 2011:147). TLT focuses on physical resources, is site-based, and users visit the physical library to get the services during the library's opening hours. This theory has become obsolete in the current SARULs environment, as users access library resources remotely from their homes or offices because of internet-based access to resources. Hoskins & Stilwell (2011:55) report that SA university libraries used the TLT model until 1983, as "resources offered by the university to libraries had been reasonable." It was appropriate, then, for the libraries to utilize the 'just-in-case' (purchasing resources without expressed need) instead of 'just-in-time' (purchasing resources against expressed need). Libraries are steadily adopting 'just-in-time'. With sweeping budget cuts, TLT is no longer feasible in today's SA environment (Leach & Tribble, 1993).

Walker's (2003) 1997 to 2002 study illustrated the above point by revealing a funding pattern that had continued a historical bias without regard for circumstances. Continuity of budgeting based on historical preference marked the beginning of the library funding deterioration. Hoskins & Stilwell (2011:51) report that this:

"Resulted in a paradigm shift in how academic libraries operate since academic librarians could no longer maintain an adequate local print collection relative to their mission 'collection paradigm'. Instead, they adopted a paradigm that reflected their fiscal realities: the access paradigm. The role of Librarians changed from 'keepers' to

'facilitators' of access to information as libraries started focusing on access to resources".

As facilitators of access to information, SARULs adopted the ELT. Kwanya, Stilwell & Underwood (2011) record that ELT started in the 1970s in academic and research libraries. ELT focused more on access and less on ownership with a mixture of physical and digital resources. Bell & Shank (2004:374) described ELT as involving:

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

They were sometimes referred to as a liaison librarian. The embedded librarian offers customized services to the users, making the library more visible to users. More use of digital resources presented a new shift in libraries known as digital libraries, where there was no need for physical collections and buildings. Digital resources introduced the DLT.

DLTs originated in the 1990s in academic, public and research libraries (Kwanya, Stilwell & Underwood, 2011). DLT focuses on access, not ownership, emphasising a library where the "collection is processed and stored in digital formats facilitating electronic searching and retrieval of the same through digital devices such as computers" (Kwanya, Stilwell & Underwood, 2011:153). According to Harter (1996), DLT is concerned with access to digital rather than with physical collections. Harter (1996) describes digital libraries as 'paperless,' 'virtual,' 'libraries without walls', 'electronic libraries' and 'bionic libraries'. Baohua, Xiaoyan & Fei (2002:531) concur and state that DLT was a significant transformation of the TLT as it changed libraries from "passive to active use; from direct to indirect service; from providing information 'blindly' to elective and accurate dissemination of information." These services were offered online and in specific library spaces with the required technology, giving birth to ICT.

ICT originated in the 2000s in academic and research libraries, focusing on specialized collections. Resources are physical and digital, with more importance on access and less ownership (Kwanya, Stilwell & Underwood, 2011). According to Cowgill, Beam & Wess (2001), ICT underscores the importance of a designated area within a library to provide electronic research resources. This area must be maintained by technically proficient staff. Academic libraries have adopted ICT along with a comprehensive array of digital library

resources, productivity software applications, and the proficiency of professional and technical support. The ICT fosters collaboration and innovation by bringing students, researchers and technology within an enriched environment (Cowgill, Beam & Wess, 2001). With more digital resources facilitated by ICT and the emerging user-centric world created by Web 2.0 technologies, libraries' presence was now visible in communities, taking libraries to another level, the L2.0 T.

L2.0 T started in 2005 in academic and public libraries, focusing on access, not ownership of diverse collection categories (Kwanya, Stilwell & Underwood, 2011). Farkas (2005) posits that L2.0 T is a paradigm shift in how people view library services. The library aims to strengthen its community presence through online and physical community building and outreach activities, leveraging new ICT tools like Instant Messenger (IM), screen casting, blogs, and wikis. Casey & Savastinuk (2007) note that L2.0 T focuses on delivering library services anywhere, anytime.

All these theories show that library services have evolved from physical buildings with shelves of books and journals to physical spaces with computers for accessing digital resources. The CCNY 2006 to 2011 programme trained SARULs librarians for this shift. This study has observed that SARULs simultaneously use ELT, ICT, DLT and L2.0 T.

While the SARULs were benefiting from the CCNY funding, shifting from collection to access-based theories, the problem of shrinking budgets and library collections continued, as alluded to by Buchanan (2008), CHELSA et al. (2014), Hoskins (2013), and Hoskins & Stilwell (2011), when they all agree that library budgets were being cut and libraries were cancelling resources to stay within the allocated budgets. There is, therefore, a need for librarians to investigate optimisation strategies or alternative ways to improve their budgets. For these libraries to succeed in using these theories, there is a need for an appropriate budgeting theory.

As part of the CCNY programme, 36 librarians were trained in two groups over three years, resulting in 12 trained librarians at the first three universities: the UCT, UKZN and Wits. Staff training was referred to as the 'Librarian's Academy'. The training occurred in SA, Mortenson Center at the University of Illinois, Urbana-Champaign and any other selected primary US research library (University of Cape Town & University of KwaZulu-Natal, 2006). The other

three universities, UP, RU and SU, joined the research universities group and their staff trained from 2009 to 2011.

In 2006, the CCNY project took these library services from TLT to ELT, ICT, DLT and L2.0 T levels. Each library created knowledge commons for undergraduate students and research common for postgraduates. These newly created spaces enabled students to access electronic resources. Library staff were appointed to serve academics and students in specific faculties or subject areas.

2.1.2 Budgeting theories

Although the library services in SARULs evolved from one theory to another in tandem with the prevailing situations, the budgeting theory remained on the TB/IB theory. Maintaining TB/IB was not unique to SA, as Prentice (1996) points out that the same method dominated the US libraries in the 1990s. It is, therefore, possible that the shrinking of library resources due to cancellations could be proof of the failure of the budgeting system. This causal link is not substantiated, but the researcher posits that it is worth investigating.

Sabela argues that there is a need to change the budgeting system to one suitable to a "highly volatile economic environment" (Sabela, 2012:43). Sabela's study evaluates the most prevalent budgeting practice in the SA business economy. It states that it is evident that a departure from traditional budgeting is inevitable and that organisations must be dynamic and maintain a competitive edge (Sabela, 2012). Sabela (2012) further explains that competitive advantage relates to the speed at which a company adapts to the economy's demands at a particular time. Although library budgeting is a core function of librarians, the theories are not found in 'library management' or higher education administration. According to Gonzalez (2011), resource allocation comes from economics and business management literature. Therefore, engaging with economic theories to understand library budgeting is prudent.

TB/IB focuses on incrementing current budgets based on the previous period's budget actual spend. It involves an allowance for inflation or other known changes (Ross & Technical Information Service, 2008). The last budget is viewed as already justified and used as a basis for the changes for the next fiscal year. In austerity environments, this budgeting approach is

not practical. Budgets will be cut annually, hence the need to rethink this theory of library budgeting.

The advantages of TB/IB are that incremental budgets are easy to create and allocate money. According to Linn (2007), TB/IB tends to create the least conflict during budgeting because it maintains the status quo (Linn, 2007). TB/IB would not be the best in SA because of its unique environment, as alluded to earlier. TB/IB has, however, more disadvantages than advantages (Hope & Fraser, 2003; Linn, 2007; Sabela, 2012). Using TB/IB in libraries will mean subscriptions to resources will continue without checking if they would still be relevant to the university's teaching, learning and research needs. According to Sabela (2012), using a previous budget to plan a new budget brings risks of the last budget into the new one. Sabela further observes that incremental budgeting may limit innovation because employees are not pushed to outdo themselves (Sabela, 2012). A limited change attitude is not helpful as the SA environment requires staff to think outside the box.

Sabela (2012) concurs with Prentice (1996) by saying that whatever figure in the budget is frozen, and the new budget is developed based on increments to the base figures, leaving staff with no decisions to make. In research university libraries, this can translate to libraries accepting the status quo and not trying to examine the collection to improve it in terms of value or cost-saving measures. Hope and Fraser concur with this view and add that incremental budgeting prevents "managers from being innovative and pushing themselves to do better" (Hope & Fraser, 2003:111).

Linn (2007:21) observes that incremental line-item budgeting locks into place the decisions of the past, and thus:

"guarantees that the units that won the budgetary battle when the incremental system was installed, whether because they were the most important to fund or received more than they deserved because of political influence, will continue to win in this budgetary process until the system is replaced".

According to Hope & Fraser (2003), companies must abandon traditional budgeting contracts in favour of a radical new model that links performance measurement to evolving competitive benchmarks and shifts the organisation's focus from controlling employee behaviour to delivering customer value. In SARULs, TB/IB is not possible due to the diminishing budget,

which is now pushing the libraries into cancellation projects. Libraries need to think of other relevant theories to help them succeed in their current economic environment.

Cooper & Kaplan (1998) state that ABB was developed to address the distortion problem of TB methods for assigning overhead costs directly to the product. Sabela (2012:50) notes that the benefit of ABB is that:

"The analysis of each activity and its contribution to the on-going success of the organisation means that activities that do not appear to relate to other activities within the organisation structure may be unnecessary and can be eliminated without having an adverse effect on the overall operation".

In academic libraries, academics are requested to review all library resources to align them to their current teaching, learning and research needs. Library materials that do not talk to current needs will then be cancelled.

Prentice (1996) notes that library objectives come from the information needs of the community which the library serves. The library then determines the resources that are, and probably will be, available to carry out these objectives. The benefit of ABB, as observed by Cooper & Kaplan (1998), is that it gives managers control over their costs and transforms fixed costs into variable ones.

"What makes a cost a variable is not inherent in the nature of the resource; rather, it is a function of the managers' decisions about how much to spend in order to supply a resource and how quickly to adjust the supply of that resource as demand for its services change" (Cooper & Kaplan, 1998:114).

ABB would, therefore, be ideal for research university libraries in their quest to manage their budget and continue to provide needed resources optimally.

As teaching and research focus changes within the university, libraries should also be able to change how much they spend on resources and what access model would be appropriate for the new demand. Cooper & Kaplan (1998:117) observe that if ABB is appropriately done, "managers are able to adjust resource supply to match future resource demands and reduce the amount of unused capacity." Hansen (2011) agrees and notes that ABB generates greater flexibility in responding to unforeseen events, thus making it suitable for an austerity environment.

Although ABB seems to be the ideal theory, Sabela believes that managers will need extensive training to understand the basics as being "more detailed information than the traditional methodology; converting normal business processes to activities and identifying cost drives might not be easy for some managers to do" (Sabela, 2012:52). Due to Sabela's comment, ABB would not be ideal for SARULs.

Another alternative approach is ZBB, developed to address the deficiencies of TB/IB (Steven, 2007). It requires organisations to do business differently, assuming that expenditure levels in the previous period do not justify future spending as a point of departure (Sabela, 2012).

Prentice (1996) adds that ZBB requires managers to justify every request for budget funds in detail and the level of funding needed per programme. In the library field, this will be deciding to take or renew a subscription to a resource at one, two or unlimited user licenses, depending on demand and budget available. In doing so, resources/programmes no longer deserving high priority will receive reduced or zero funding (Prentice,1996). Austin & Cheek (1979) historically pointed out that, in principle, ZBB is about searching for alternatives by starting from scratch. Prentice (1996) sums this up by claiming that it is an underlying assumption that even if an activity merits funding, it can be funded at a level below the current level, offering the service less than the current level. To illustrate this, Kagan (2018) stated that this happens when companies insource certain services instead of outsourcing them to expensive providers. In so doing, the same service will be offered at a lower funding level.

In Austin & Cheek's (1979:2) early view, ZBB top management stops challenging budget requests with questions such as "why does this section cost so much? and starts asking what alternatives have been considered?" Austin & Cheek's (1979) early view is still relevant today as the austerity environment has championed pursuing alternative access to resources discourse worldwide (Nosakhere & Abdelwahid, 2014; Pendell, 2018; University of California, San Francisco Library Help Center, 2020; Virginia Polytechnic Institute and State University Libraries, 2020). After cancelling the Elsevier ScienceDirect deal in 2019, the University of California redirected library users to alternative platforms to access published articles free. The University of California San Francisco (UCSF) library help centre, thus, created a webpage, 'Alternative access: how to get the Portable Document Format (PDF)?' (University of California, San Francisco Library Help Center, 2020).

Pendell's (2018) study concluded that social workers failed to access research behind the publisher paywall. Pendell's alternative access recommendation was rewarding open-access publishing and repository archiving as a reflection of community engagement in promotions and tenure. In Africa, Nosakhere & Abdelwahid's (2014) examination of several African university library websites revealed the strong presence and essential role of OA resources. OA was not only perceived as a traditional publishing alternative but more as access to scholarly content.

Sabela notes that ZBB "may ensure that inappropriate activities are not undertaken since it makes a full evaluation of existing activities concerning future needs" (Sabela, 2012:56). An ideal practice in the SARULS in an austerity environment is directing budgets to needed resources only, thus avoiding any unnecessary expenditure.

The benefits of ZBB are its focus on identifying programmes that will further the company's goals for the future (Dossett & Williams, 2004). According to Linn (2007), ZBB points out those expenses that are no longer necessary, thus allowing the library to shift money to where it will be needed in future. Lozynska & Chaikovskiy (2023) noted that using ZBB would ensure the efficient distribution of organisational resources. Managers were encouraged to be innovative and mindful in closing the gaps for unsubstantiated budgets. Staff morale increased with more significant initiative and responsibility in decision-making. ZBB had earlier been viewed as promoting, coordinating, and controlling effective communication within the organisation, and it detected fruitless and wasteful operational activities (Suver & Brown, 1977). The Northern Ireland Assembly, Research and Library Services (2010) concluded that ZBB can be adaptive to changes in circumstances and priorities, which might lead to better resource allocation.

According to Zach, the ZBB approach is viewed as "an appropriate instrument to rank library programmes by cost/importance to organisational goals and to identify and eliminate programmes that provide minimal value" (Zach, 2002:22). Since ZBB concentrates on the justification of continued funding of individual activities, Linn (2007) adds that it is more relevant during a time of fiscal austerity, rather than growth. The researcher views SARULs to be in a time of economic austerity, so this could be the ideal theory to consider.

However, ZBB has its limitations, as noted earlier by Austin and Cheek (1979), when they stated that it demands that managers justify every expenditure and requires the involvement of many managers, which might pose challenges to administering and communicating the process (Austin & Cheek, 1979). Prentice adds that employees may see ZBB decision-making activities, particularly those that reduce current levels of services, as dangerous to their livelihood and resent the process (Prentice, 1996). ZBB affects day-to-day operational activities in libraries, such as journal subscription renewals and standing orders (Warner, 1992). Suver and Brown emphasize that "an astute manager will selectively apply the technique to those areas that offer the potential for greater pay-off" (Suver & Brown, 1977:76). The benefits of ZBB outweigh its shortfalls in realizing savings by considering each resource's need against the prevailing teaching, learning and research needs. This makes ZBB an ideal theory to consider in the current SARULs austerity environment.

FB adopts an entirely different approach. It assumes that funding levels are calculated using a formula based on the number of faculty, the number of students, the size and scale of academic programmes and the level of research output (Prentice, 1996). Educational institutions use FB, and Linn notes that libraries that use FB have deemed the factors incorporated in the formula essential in the organisation's running (Linn, 2007). FB encourages librarians and administrators to apply their minds to their budgeting process.

The main advantage of FB, as noted by Linn (2007), is that it makes budgeting relatively easy for directors to predict the amount of money that will be allocated. However, she quickly cautions that its "rigidity makes it unlikely to foster innovative practices or new programmes" (Linn, 2007:22). An austerity environment requires innovation, so FB might not be suitable for SA.

On the disadvantages of FB, Linn (2007:22) observes that:

"Although FB can be thought of as a relatively rational approach to budgeting because there seems to be little room for political influence in the allocation of funds, the creation of the formula can be the result of a political process".

FB entails that those who had power during the formula creation or revision time may influence the reward of their units' most excelling elements. The formula would initially have a built-in advantage for a particular group (Linn, 2007).

Formula budgeting is rigid, as noted by Linn (2007), and it requires that LDs define budget lines as broadly as possible. To illustrate this, Linn states that the governing body would not allow LDs to move from one line item to another, for example, microfilm to databases, without approval, as the naming would differ. For the directors to be able to move funds, broad naming of line items is necessary, since:

"if there had been one line for the purchasing of all types of materials for the library collection, one could easily stop buying microfilm and use that money to purchase more databases" (Linn, 2007:23).

Dossett & Williams (2004) illustrate that FB's weakness of calculating the budget total at a late point in time affects advanced planning within the library. FB's "lack of identification with parent organisation's goals and objectives" and "the unpredictable nature of the budget since the formula is based on variables outside the influence or control of the library" (Dossett & Williams, 2004:5). Due to the rigidity of the FB theory, the researcher believes that it was the reason why it was not helpful with the SARULs problem. A flexible approach was, therefore, desirable.

Linn (2007) notes that TB is the most widely used type of budgeting in libraries. Sabela (2012:9) emphasises that ABB, ZBB and FB should be the preferred theories as they allow organisations "the flexibility and ability to counter economic challenges for them to remain competitive." Library budgeting theories moved from TB to ABB, ZBB and FB as these were regarded as suitable theories for a highly volatile economic environment (Cooper & Kaplan, 1998a; Linn, 2007; Prentice, 1996; Ross & Technical Information Service, 2008; Sabela, 2012; Steven, 2007; Zach, 2002). As demonstrated earlier, library services theories also moved from TLT, ELT, ICT, DLT and L2.0 (Baohua, Xiaoyan & Fei, 2002; Bell & Shank, 2004; Cowgill, Beam & Wess, 2001; Farkas, 2005; Harter, 1996; Hoskins & Stilwell, 2011; Kwanya, Stilwell & Underwood, 2011; Leach & Tribble, 1993). The researcher has observed that library resources continue to shrink with all these changing libraries and budgeting theories. It might be time to introduce a management theory to address the problem effectively.

There is a need for a paradigm shift in how libraries operate to stop collections from shrinking with undesirable consequences. Fitchett et al., (2011) encourage librarians to be imaginative, creative, and strategic thinkers. Tough economic times offer opportunities to step back from routine tasks to evaluate objectives and the systems employed to reach those objectives (Fitchett et al., 2011). This study aims to step back from all recognised library services and

budgeting theories and investigate if the management theory, TOC, cannot bring new opportunities that the SARULs can pursue to ensure that their users continue to have access to the resources.

2.1.3 Theory of Constraints (TOC)

TOC is a management theory that focuses on goal achievement and seeks to understand "the underlying cause-effect relationships that are responsible for an organisation's performance" (Reid, 2007:209). The study will investigate if TOC can help provide optimisation solutions that exclude cancellations of subscriptions.

By definition, TOC is a system improvement philosophical management theory, which "applies the cause-and-effect thinking processes used in the hard sciences to understand and improve all systems, but particularly organisations" (Burton-Houle, 2001:4). Vorne (2011) simplifies this definition by saying TOC is a methodology designed to identify the most critical constraint hindering the achievement of a goal. It involves a systematic process of improvement aimed at addressing and resolving that constraint until it no longer poses a limiting factor. SARULs need to be able to identify their constraints and mitigate or eradicate the impact of the constraints. TOC notes that after defining a constraint and reducing its effect, another one is identified as most important, thus repeating the cycle.

Mabin & Balderstone (2003:568) describe TOC as a "multi-faceted systems methodology developed to assist people and organisations in thinking about their problems, developing breakthrough solutions and implementing those solutions successfully." In this study, the problem is the shrinking of library resources. The research has identified austerity budgets as the major problem causing the shrinking of resources. If Mabin & Balderstone's (2003) description of TOC is considered, then using TOC as the study lens will significantly help this study as it will help identify more constraints, if any, and the librarians will identify solutions. TOC started in the 1970s as a manufacturing scheduling algorithm (Mabin & Balderstone, 2003). It evolved over the years, changing names from Optimised Production Timetable in 1979 to Optimised Production Technology in 1982, and then to TOC in 1987, signalling a significant change in emphasis from scheduling logic to focusing on ongoing improvement (Mabin & Balderstone, 2003). The 1990s saw the addition of the TP as a concept that introduced the thinking and behaviours required in any change process. Although TOC started

in manufacturing industries, Mabin & Balderstone (2003) and Mabin (2015) observe that the addition of TP in the 1990s made TOC applicable to non-manufacturing companies. TOC successes are in service organisations, giving the researcher the confidence to investigate its applicability in libraries.

According to Siha (1999), TOC has two main branches: everyday operations and continuous improvement. The daily activities have two elements: the Drum Buffer Rope (DBR) and Optimised Production Technology. Ikeziri et al. (2019) note that DBR and OPT focused on production areas. This study is in the service area. Therefore, it will focus on the continuous improvement branch, which has two elements, the TP and the FFS, as shown in Figure 2.1 below:

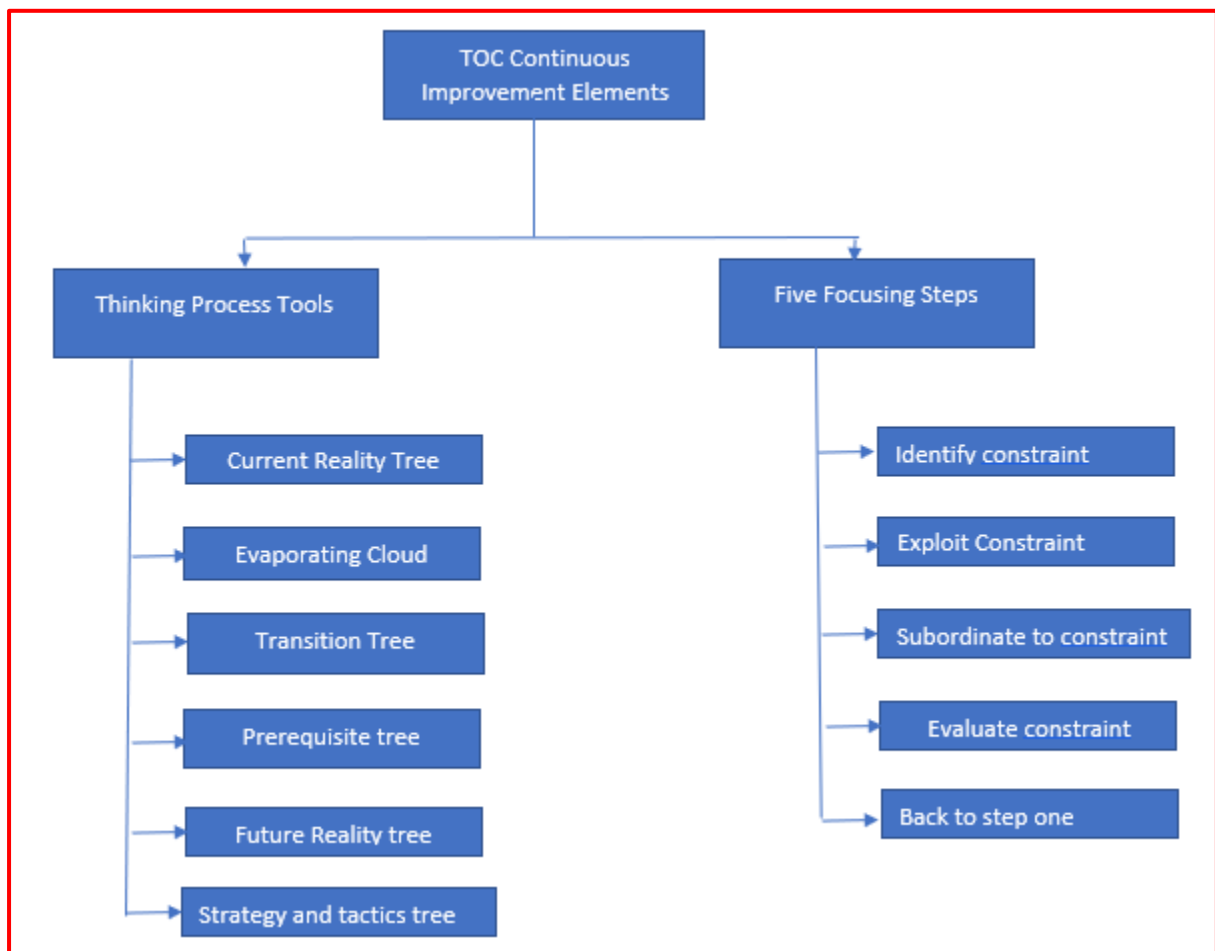


Figure 2.1: TOC Continuous Improvement Elements

Source: Adapted from Sanjika (2010)

In the TP, when drawing the trees and cloud diagrams, people "are forced to think about the true cause of the problem" (Siha 1999:256), and thus, the root cause is identified, and a solution

for the root cause, not the symptoms, is planned. Burton-Houle (2001) used an analogy with a clinician to illustrate how TOC works in the services sector. Diagnosis is the first step, achieved by listing all observable symptoms. In this study, the symptoms are the shrinking of library resources. The second stage is designing the treatment plan to treat the disease, ensuring the treatment will work and preventing what can go wrong (side effects). This is the aim of this study, referred to as optimisation of the austerity budgets. The final stage is executing the treatment plan, including scheduling pre- and post-surgery activities, transportation and securing hospital beds. This stage will be the logical follow-through after identifying the optimisation strategies. All these processes involve different people, patients, clinicians, and various departments within the hospital, and families. Continuous improvement must be realised in all these individual processes.

This study acknowledges that SARULs need to operate like Burton-Houle's analogy to achieve maximum optimisation of their budgets. Instead of diagnosis, designing the treatment plan and executing the treatment terminology, this study will use the fundamental questions 'What to change'? 'What to change to'? Furthermore, 'How to cause the change'?

These questions will be answered through the TOC TP (Burton-Houle, 2001; Inman, Sale & Green, 2009; Mabin & Balderstone, 2003; Vorne, 2011). Burton-Houle (2001) cautions that for any organisation to realise ongoing improvement, managers must make three generic decisions when dealing with constraints, as shown in Table 2.1 below:

Table 2.1: Thinking process tools and their roles

Generic question	Purpose	TP tools
What to change?	Identify core problems	Current reality tree (CRT) – describes the existing situation).
What to change to?	Develop simple, practical solutions.	Evaporative cloud (EC); Future reality tree.
How to cause the change?	Implement solutions.	Prerequisite Tree (PRT). Transition tree (TT).

Source: Rahman (2002)

On what to change, the observable symptoms will help identify the core problem for all the signs. On what to change to, a possible solution to the identified core problem is suggested. The how-to cause a change considers the organisation's culture and how to get consensus and buy-in to achieve any new strategic goals. SARULs are linked/interdependent with internal (library and university) and external (government, SANLiC, market, and vendors/publishers) processes. All these organisational processes need to be harmonized, as noted by Dettmer (1997), that the success or failure of an organisation is dependent on how well different methods interact. Mabin & Balderstone (2003) caution that the key to maintaining a global perspective is to avoid using local measures, which encourage local thinking at the expense of global objectives and measures. According to Mabin & Balderstone, local standards have been demonstrated to conflict with universal rules and may lead to erroneous decisions. SARULs must think of global solutions and not be limited to local standards. There is a need to draw a current reality tree to identify the constraint. Vorne (2011) further explains the four trees in Table 2.2 below:

Table 2.2: TP tools, roles, and description

Tool	Role	Description
Current Reality Tree	Documents the current state.	Diagram that shows the current state, which is unsatisfactory and needs improvement. When creating the diagram, Undesirable Effects (UDEs) (symptoms of the problem) are identified and traced back to their root cause (the underlying problem).
Evaporating Cloud Tree	Evaluates potential improvements.	A diagram that helps to identify specific changes (called injections) to eliminate UDEs. It is particularly useful for resolving conflicts between different approaches to solving a problem. It is used as part of the process for progressing from the Current Reality Tree to the Future Reality Tree.
Future Reality Tree	Documents the future state.	Diagram that shows the future state, which reflects the results of injecting changes into the system that are designed to eliminate UDEs.
Strategy and Tactics Tree (STT)	Provides an action plan for improvement.	Diagram that shows an implementation plan for achieving the future state. Creates a logical structure that organizes knowledge and derives tactics from the strategy. Note: This tool is intended to replace the formerly used Prerequisite Tree in the Thinking Processes.

Source: Vorne (2011)

Lin, Lee & Lee (2009) give a visual of the TP tools as a roadmap for illustrative and clarity purposes. The roadmap below, Figure 2.2, helps identify and address organisational problems (Amonge & Doggett, 2017).

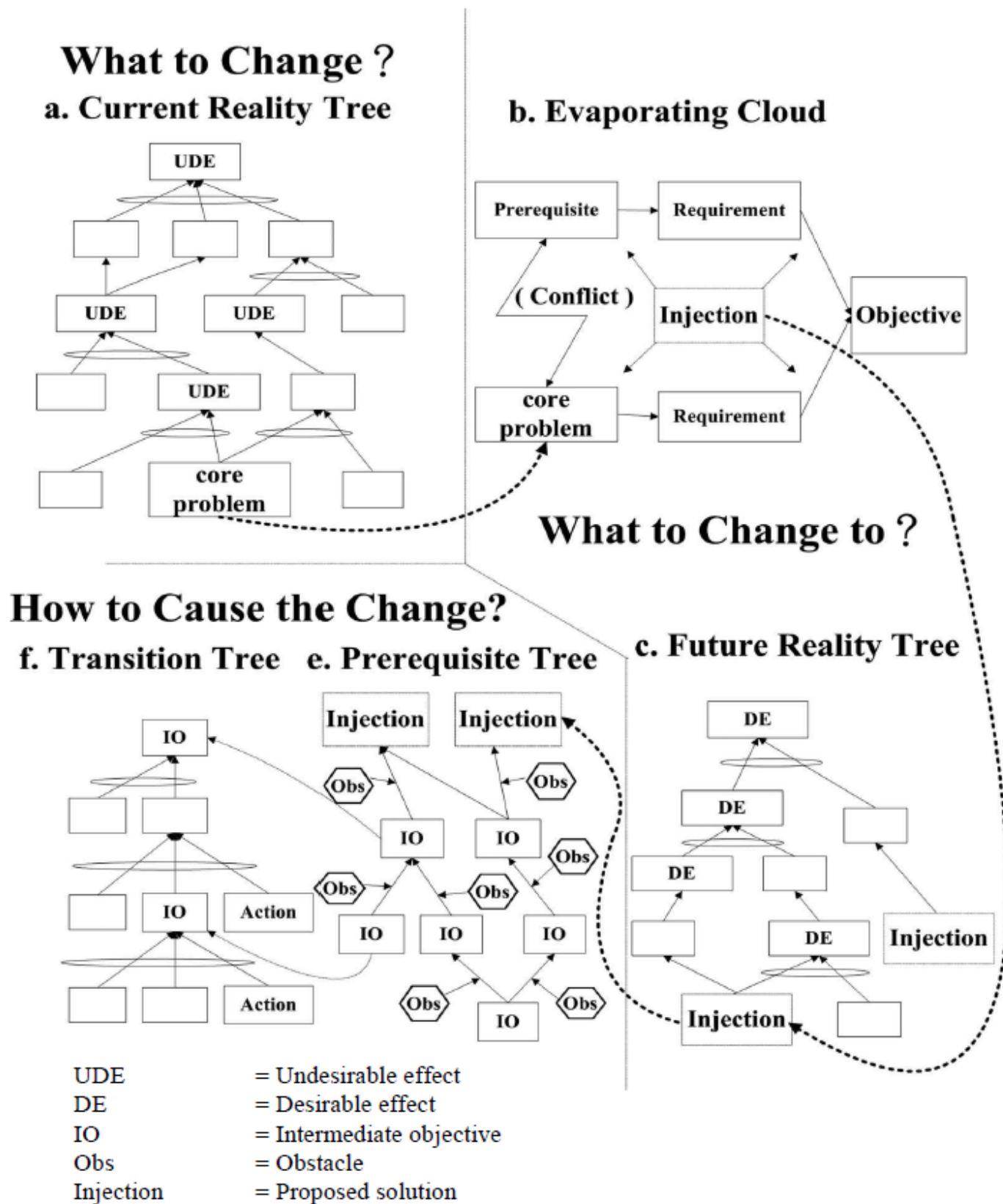


Figure 2.2: Theory of Constraints Thinking Processes roadmap

Source: Lin, lee & Lee (2009)

According to Inman, Sale & Green (2009), Kim, Mabin & Davies (2008) and Scoggin, Segelhorst & Reid (2003), the roadmap guide provides the process of identifying problems referred to as UDEs, finds the causes, plans solutions, brainstorms the expected barriers on implementation stage and eventually implements the solution.

To realise meaningful change, Goldratt & Cox (1992) suggest the five steps focusing process on following the TP tools. The FFS shown in Figure 2.3 below allows managers to analyse problematic situations and identify, enhance, and implement appropriate solutions. The FFS focuses on the constraint/weakest link, which is explained using the chain analogy (Dettmer, 1997; Noriaki et al., 2008). "Like a chain, a system's performance is limited by the performance of its weakest link" (Dettmer, 1997:xxi). The weakest link is the system's constraint. According to Noriaki et al. (2008), TOC provides a framework for diagnosis, treatment/selection and focus in management. The actual problem needs to be identified, and Siha (1999) notes that accurately identifying a problem is the first step toward solving it.

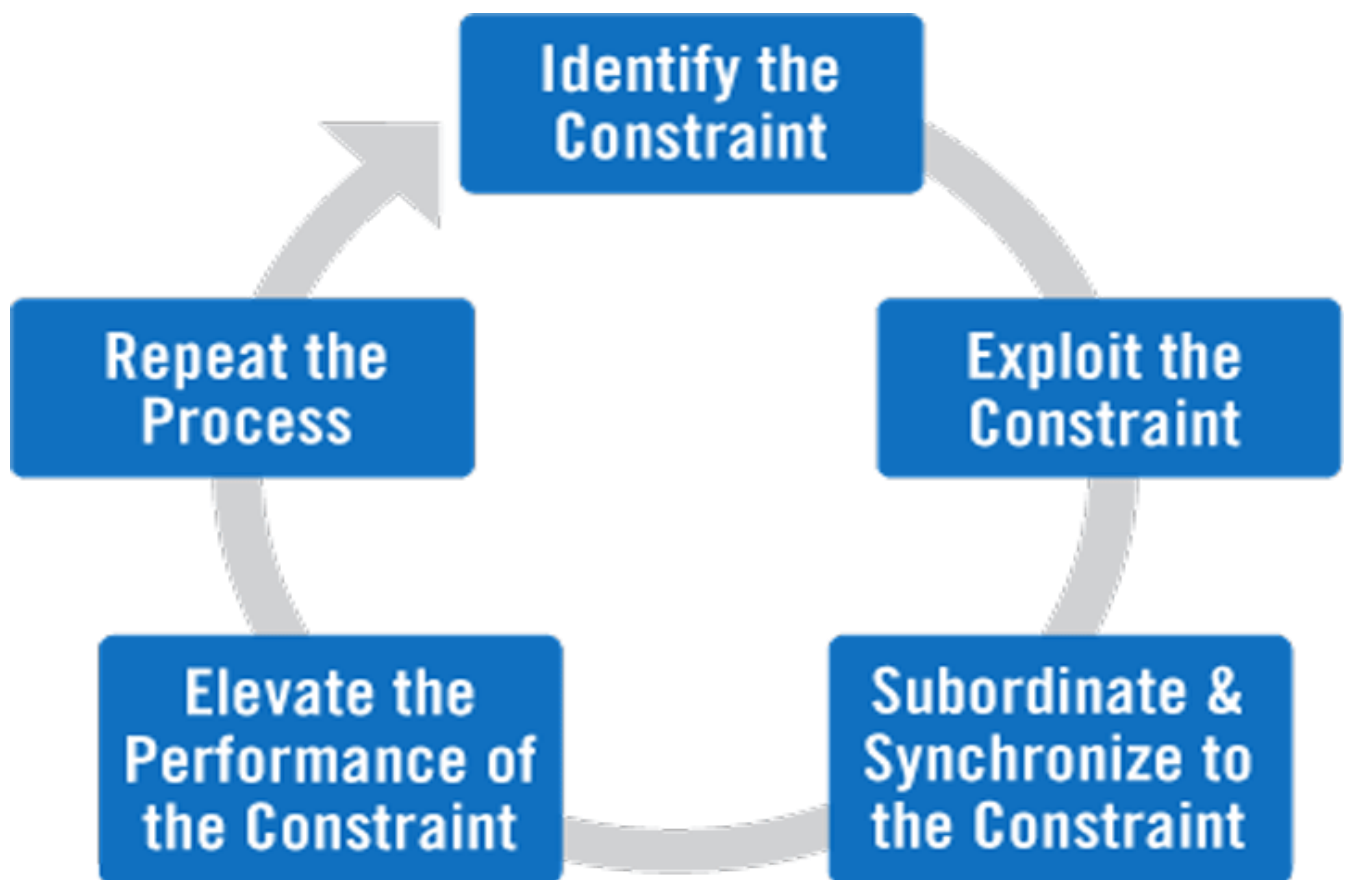


Figure 2.3: Five Focusing Steps (FFS)

Source: Vorne (2011-2019)

Vorne (2011-2019) explains the objective of the FFS in Table 2.3 below. The FFS assists organisations in clarifying the expected outcome on each level.

Table 2.3: FFS explanations

Step	Objective
Identify	Identify the current constraint (the single part of the process that limits the rate at which the goal is achieved).
Exploit	Make quick improvements to the throughput of the constraint using existing resources (i.e. make the most of what you have).
Subordinate	Review all other activities in the process to ensure that they are aligned with, and truly support the needs of, the constraint.
Elevate	If the constraint still exists, (i.e. it has not moved), consider what further actions can be taken to eliminate it from being the constraint. Normally, actions are continued at this step until the constraint has been "broken" (until it has moved somewhere else). In some cases, capital investment may be required.
Repeat	The Five Focusing Steps are a continuous improvement cycle. Therefore, once a constraint is resolved, the next constraint should be addressed. This step is a reminder never to become complacent – aggressively improve the current constraint and then immediately move on to the next constraint.

Source: Vorne (2011-2018)

According to Rahman's (2002) observation, continuous improvement will eventually shift constraints from inside the organisation to the market. In a factory/manufacturing environment, this would be issues of insufficient demand, while in the context of this study, it will be the vendor/publisher or government policy changes. Rahman (2002) refers to these outside constraints as managerial or policy constraints, which are difficult to identify and evaluate as they involve the cooperation of different stakeholders. For this study, these external bodies could be the SA government, relevant ministries/government departments and officials, library organisations within and outside SA, and the international trends regarding the constraints. These will require changes at the policy level. For example, the SA government might need to

take a policy position regarding subscription to library resources at the national level, not at the individual institutions.

Goldratt (1994) notes that TP was developed to address these policy and managerial constraints and to identify solutions using common sense, intuitive knowledge, and logic. CRT identifies core problems in what to change by showing a logical structure of the reality as it exists currently before any intervention. In this research, this is the ‘what is the problem?’ and will be shown in Figure 2.4 as a conceptual map in this chapter's conceptual framework section (Section 2.2). Noreen, Smith & Mackey's (1995) guidelines for developing the CRT will be followed.

The EC and Future Reality Tree (FRT) are the next steps in searching for solutions, which in this study is how the SARULs optimise their budgets. PRT and TT will be looking at any obstacles to implementation and planning to overcome the challenges (Rahman, 2002).

This study will not discuss all five TP tools in detail, as the focus is on what to change – identifying the constraints, whether austerity budgets are the only constraint, and what to change to – optimisation strategies. PRT and TT will, therefore, not be part of this study.

2.2 Conceptual framework

Camp (2001) describes a conceptual framework as a structure the researcher believes best explains the phenomenon to be studied. Like Camp (2001), Luft et al. (2022) and Nicholson et al. (2020) note that a conceptual framework delineates the main things to be considered and the presumed relationships. Grant & Osanloo (2014) and Maxwell (2013) illustrate a conceptual framework as being arranged in a logical structure to visually display how ideas in a study relate to one another. According to Scott & Cotton (2020), a conceptual framework explains, either graphically or in a narrative form, the main things to be studied, the key factors and the relationships among them. Maxwell (2013) notes that conceptual maps do not depict the study itself, nor are they a specific part of either a research design or a proposal, but that they are used to visually present the design or operation of a study with the concepts, which have arrows connecting them to show relationships. Miles & Huberman (1994:22) earlier justified doing a conceptual framework using a graph, noting that:

"Having to get the entire framework on a single page obliges you to specify the discrete phenomenon, to map likely relationships, to divide variables that are conceptually or functionally distinct and to work with all the information at once."

Diagrams will help clearly define the study variables and show their relationships through arrows (Adom, Hussein & Agyem 2018). With all this reasoning in mind, this study will present a graph as a conceptual map to show the theories and experiences the researcher brings and draws on in conceptualizing the study. This process, according to Maxwell (2013), speaks to what the researcher thinks is going on, which is summed up by Schram (2006:62) when he declares, "Here is how I am positioning my problem within an established arena of ideas and here is why it matters." The conceptual map, Figure 2.4 below, is the author's construction as guided by Camp (2001); Grant & Osanloo (2014); Maxwell (2013); Miles & Huberman (1994); Schram (2006).

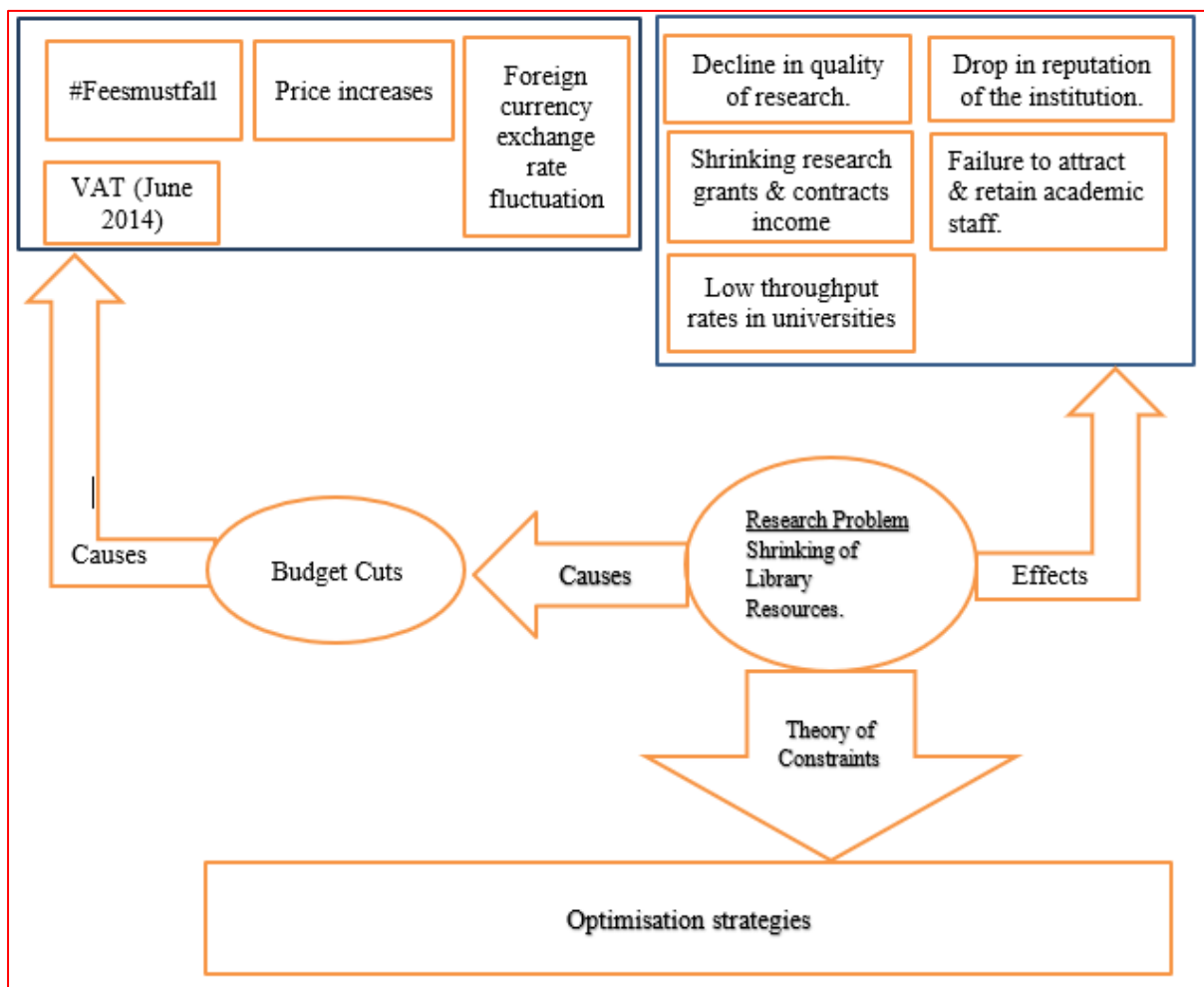


Figure 2.4: Conceptual map

The conceptual map illustrates that the problem of shrinking library collections is real, as evidenced by the annual cancellations the libraries are embarking on (Hoskins & Stilwell, 2011). The effects of these cancellations are itemised as low throughput rates in universities (CHELSA et al., 2014; Crawford, 2015), a decline in the quality of research, and a drop in the reputation of institutions (Hoon, 2003), while Society of College, National and University Libraries (SCONUL), (2016) added the failure to attract and retain academics and the shrinking research grants and contracts income. The researcher acknowledges that the mentioned list is not exhaustive, as there are other effects. However, the effects of library resource cancellation or shrinking are beyond the scope of this study. This study aims to identify all the causes of shrinking resources and how SARULs are mitigating them. This study will use the TOC to help identify constraints and indicate optimisation strategies.

2.3 Relevance/advantages of TOC to this study

Vorne (2011) notes that the advantage of TOC is its ability to generate a strong focus towards a single goal and to remove the constraint so as to move towards achieving the institutional goal. Goldratt (2010) considers the focus to be the essence of TOC. Vorne (2011) envisages fast improvement when focusing all attention on one critical area – the system constraint. He argues that optimizing non-constraints will not provide significant benefits and that only enhancing the limitation will help achieve the desired goal.

The main advantage of TOC is its applicability to various organisations and professions. Chaudhari & Mukhopadhyay (2003), Lieber & Ronen (2010), Mabin & Balderstone (2020), Goldratt (2003), Pass & Ronen (2003), Raz, Barnes & Dvir (2003), Reid & Shoemaker (2006), Ricketts (2007), Ronen, Gur & Pass (1994), Ronen, Pliskin & Pass (2012), Wacker (1998), and Watson, Blackstone & Gardiner, (2007) agree and illustrate the TOC applicability to commercial organisations (Boeing Delta Airlines, General Motors, General Electric, Ford Motor Company, 3M, and Lucent Technologies), professional, scientific, technical, business, managerial, industrial, not-for-profit (Habitat for Humanity, Pretoria Academic Hospital, British National Health Service, United Nations, NASA), US Department of Defence (Air Force, Marine Corps and Navy and the Israeli Air Force), government agencies, hospital clinics, and in agriculture (poultry industry). All these applications gave this study confidence to investigate TOC's applicability to libraries.

Dettmer (1997) argues that TOC encourages people to rethink what they can do to get the most out of a constraint without committing to potentially expensive changes. This resonates with the objective of this study, as austerity budgets are the main constraints, and there is no excess money to spend. TOC also acknowledges that there is not one constraint in any organisation. There are external constraints that are beyond SARUL's control, which are the market and the vendors/publishers. TOC would, thus, encourage the SARULs to identify these constraints and focus on finding solutions to eliminate them. However, TOC has its weakness that needs discussion and careful mitigation for the benefit of this study.

2.3.1 The disadvantages/shortcomings of the TOC

Naor, Bernardes & Coman (2013) observe that the unique aspect of TOC is not without challenge, claiming that TOC borrowed from more than forty years of previous management science research and practice. However, this thinking was earlier acknowledged by Goldratt (2009), not as a disadvantage but as an advantage, as it means that TOC is standing on the shoulders of giants. According to Naor, Bernardes & Coman (2013), TOC as a scientific theory provides a more holistic managerial approach that raises new insights. The disadvantage of TOC is mainly in the identification of the constraints. Bert (n.d.) notes that failure to identify the proper constraints could result in wasting time and resources on constraints not critical to the company's success. Another limitation of TOC is its lack of consideration of variable constraints, such as demand for a product, which might vary. Bert (n.d.) notes that product demand could be a temporary constraint, which changes due to market dynamics. Thus, resources invested in increasing the demand could help in expanding production capacity. There is a need to use other data, such as market studies, to check if the identified constraints would remain fixed.

Bert (n.d.) observes that TOC works on current timeframes, looking at the actual situations/symptoms, thereby limiting itself to short-term effects. This, however, does not relate to the present study, as the shrinking of resources due to budget cuts has had a long-lasting impact on SARULs. Bert (n.d.) advises that all identified constraints should be examined for long-term effects to overcome this limitation. If no long-term effects are observed, another constraint must be identified.

Another disadvantage of TOC, according to Mabin & Balderstone (2003), is that there has been a significant positive reporting bias. Mabin & Balderstone (2003) mention that despite extensive searching in over 400 books, journals, conference papers and web articles on TOC, no failure was recorded in the 1990s regarding TOC. However, it is essential to note that the authors who reported these success stories were authoritative, ranging from academics, consultants, TOC experts, company representatives and reporters. Nevertheless, this non-failure reporting could be questionable/problematic.

Care will be taken not to rely too much on the theory to the extent of not being critical in applying the theory to the study. Miles & Huberman (1994) caution on this and add that the research should be able to see events and relationships that do not fit the predefined categories. This study will take note of all known disadvantages of the TOC and mitigate them for the benefit of the study.

2.4 Summary of the chapter

The chapter discussed the changes in library and budgeting theories over time to optimise library budgets. However, the changes did not realise significant savings on library budgets, hence the need to introduce TOC, a management theory. TOC was selected to inform this study and was discussed in detail, and its relationship to the study was demonstrated. The continuous improvement branch elements, the TP and FFS, were also discussed. Using the logic diagrams, referred to as the 'four trees and a cloud,' it is reasonable to expect the study's problematic areas to be identified, then deduce the causes, what needs to be done to correct the causes, and how to implement the solutions. TOC will encourage libraries to continue looking at how to mitigate the shrinking of library resources. After solving one problem, another one will be found, and funds will be pulled towards solving it. Therefore, problem-solving will not stop. The chapter concludes by showing the advantages and disadvantages of TOC. The next chapter, the literature review, will contextualise the study.

CHAPTER THREE

LITERATURE REVIEW

3.0 Introduction

This chapter analysed relevant synthesised and integrated information about the study so as to find literature that could enhance the study, determine the knowledge gap, and support the need for the study. This is consistent with Du Plooy-Cilliers, Davis & Bezuidenhout (2014), who assert that a literature review puts a study in perspective and establishes what previous scholars have written about the study. Creswell & Creswell (2018) and Marshall & Rossman (2016) concur, adding that a literature review serves to contextualise a study, provide a framework for establishing the significance of the study, and share results of other studies related to the study. A literature review also relates the study to the ongoing dialogue in the literature.

Henning, van Rensburg & Smit (2004) had earlier posited that literature review entails critically engaging with literature, setting up a conversation with the literature, letting speakers enter the conversation, and keeping the conversation live. Walshaw (2015:37) agrees, adding that,

“You will not be able to make a worthwhile contribution to knowledge if your research is situated on the fringe of current arguments. Nor will you be able to contribute to those debates if you reproduce what others have already done”.

Therefore, this chapter critically explored literature to situate the study within the context of the existing body of knowledge.

3.1 Austerity budgets

The literature reviewed was aligned with the study’s research objectives of determining if austerity budgets are the only problem causing the shrinking of library resources, optimisation strategies in place and TOC usefulness in optimisation strategies. This aligns with Du Plooy-Cilliers, Davis & Bezuidenhout's (2014) instruction that a literature review must follow clear and logical reasoning and explanation. This study examined whether austerity budgets are the only problem causing the shrinking of library resources.

University libraries are highly valued, as they are essential for learning, teaching, community engagement and producing new knowledge through research. Due to this valuable contribution, Ajani et al., (2022), Rafiq et al., (2021) and Shulenburger (1999) emphasised that the shrinking of budgets is not only a library or university problem, but a challenge for the scholarly communication field. According to Hunter & Bruning (2010) and Walker (2022), austerity budgets present challenging times for universities worldwide, libraries and publishers. While universities reduce funding to their libraries, libraries reduce subscriptions and some publishers, vendors or agents are driven out of business.

Unsustainable price increases for some resources result in cancellations and, thus, compromise access to scholarly communication. Tapfuma & Hoskins (2019) note that the increase in subscription and the shrinking library budget has resulted in universities and research institutions failing to provide access to research and development resources. There is, therefore, a need to control library resource costs and create new optimisation strategies to ensure that libraries gain access to, and preserve, the growing volume of available scholarship.

3.2 Austerity budgets and shrinking library resources.

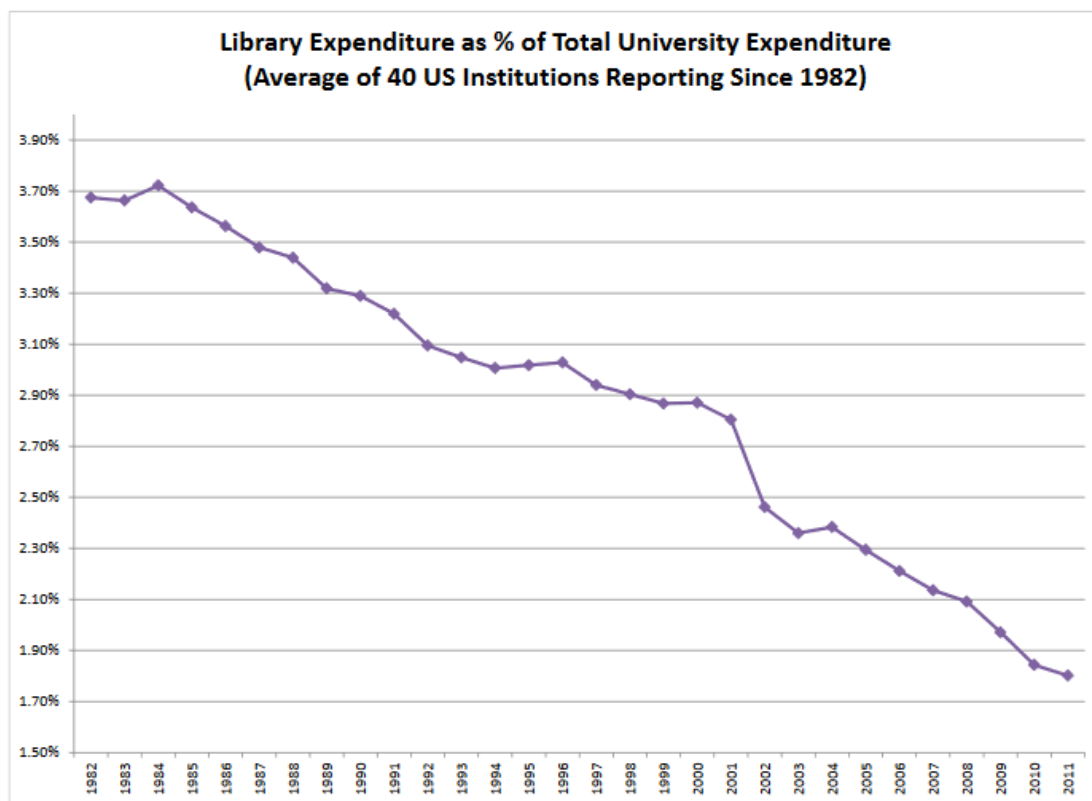
The problem of austerity library budgets is not peculiar to SA University Libraries.

Flesch (1997) examined the expenditure on library resources across eight major Australian universities from 1993 to 1995 and discovered a clear downward trend in acquisition budgets. Flesch (1997), Mubofu & Chaula (2020) and Yakubu (2023) further observed that faced with such shrinking budgets, university libraries tried to minimize costs through cooperation. Libraries opted for cooperation as an optimisation strategy in the budget-constrained environment.

In the UK, Weir (2010) reports that a 2009 survey conducted at the University College of London by the Center for Information Behaviour and the Evaluation of Research group, Charleston conference, Yankee Book Peddler library services and Ebrary found that 43% of academic libraries were already facing or expecting budget cuts up to 10%. A further 39.4 % of libraries expected the budget to remain the same.

Hunter & Bruning (2010) report that in 2010, Iceland libraries experienced a significant 20-25% decline in funding due to Iceland's economic collapse. At the same time, Hungarian

institutions experienced a 15% cut. Meanwhile, in the US, a study of 40 research libraries revealed that the percentage of university funds allocated to libraries decreased by over one-half in the space of three decades “from a high of 3.7% in 1984 to just 1.8% in 2011” (Davis, 2014:2). Figure 3.1 below offers a visual illustration of this trend:



© Association of Research Libraries, 2013

Figure 3.1: Shrinking of university library funding

Source: Association of Research Libraries (2013)

The reason given by Davis (2014) for the austerity budgets was that libraries had lost their position as the intellectual hub of the university. In addition, administrators displayed no interest in libraries, as evidenced by the Southern Oregon University library case. In 2002, the library was required to reduce its budget by 10%. This was a large slice of the budget, and the result was that electronic resources had to be cancelled, and the rest of the acquisition budget was reduced to protect their staff members (Miller-Francisco, 2003). The library could have laid off some staff members if the resources were not cancelled and the acquisition budget reduced. According to Miller-Francisco (2003), the 10% translated into a significant decrease,

considering that annual increases of many databases ranged from five, ten and sometimes even 20%.

In the US, the Association of College and Research Libraries (ACRL) published a report in 2017 titled *Academic Library Trends and Statistics*. According to the report, 60% of the 1,525 libraries that responded to their survey had experienced stagnant budgets for the preceding five years (Bosch, Albee & Henderson, 2018). The research advisory firm Outsell corroborated this finding in their October 2017 report, noting that “the overall 2017 library spend was flat compared to 2016” (Bosch, Albee & Henderson, 2018:29).

Echoing the same sentiment as Davis (2014), Flesch (1997), Miller-Francisco (2003), Weir (2010), and the SANLiC (2017) forecasted a decline in database subscriptions from 2018 to 2020, as a direct result of budget cuts. The SANLiC graph, Figure 3.2 below, showed the 2018-2020 subscription forecast based on a three-year actual average of -7.4% per annum. The purple line shows how subscriptions would decrease yearly (SANLiC, 2017). This 2017 SANLiC annual report represented the funding situations in all SA University, Research and Council libraries.

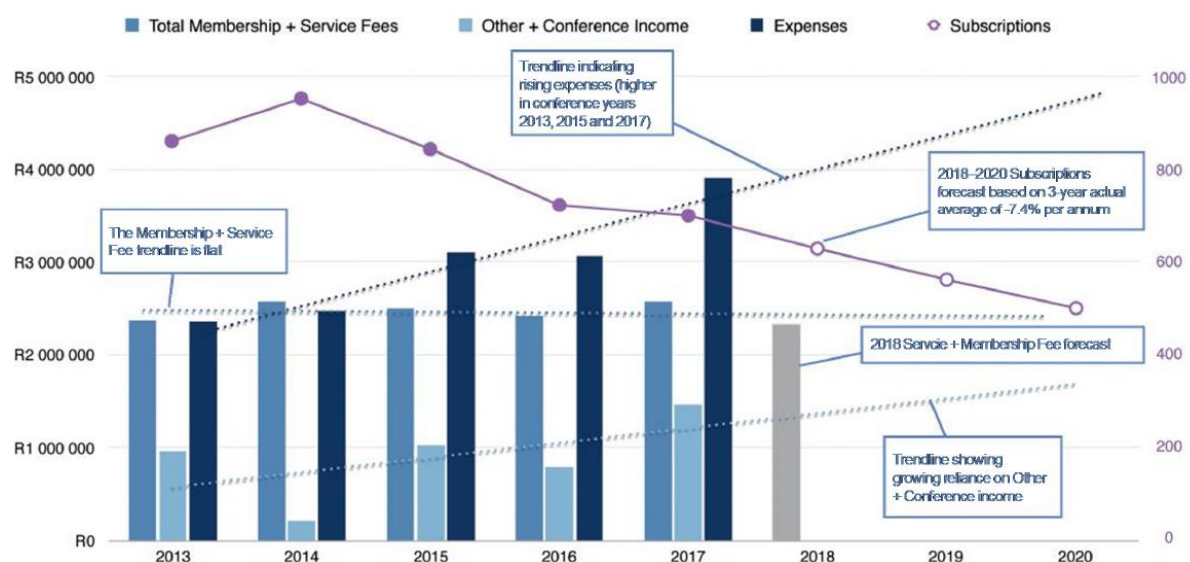


Figure 3.2: Graph showing a decline in subscriptions

Source: SANLiC Annual Report (2017)

As a result of declining budgets worldwide, Kachel (2017) observes that many librarians stopped budgeting because they knew their libraries would not receive adequate funding. However, this was a wrong approach because, as stated by Kachel (2017:48), a library budget consists of what “can be begged, borrowed, or purchased through fund-raising or grant-writing efforts.” Therefore, librarians must present and highlight their budget requirements for consideration, as the budget managers may be unaware of these needs (Kachel, 2017). The fact that library budgets are declining is indisputable. The question now arises about the root causes of budget declines.

While Davis (2014), Guarria & Wang (2011), Miller-Francisco (2003) and Weir (2010) posit that shrinking budgets are due to reduced library allocations by university administration or state departments, Jump (2015), Lachenmayer (2019), McCabe (2001), Reich (2000), Tamber (2000) and Wyly (1998) attribute budget cuts to publisher mergers, pricing models and the behaviour of scientist/researchers/academics. Therefore, it can be reasonably assumed that all these factors contribute to the shrinking budget and will be further examined in the following narratives.

3.2.1 Publisher mergers

According to Lachenmayer (2019), mergers create academic content monopolisation, threatening the free flow of scholarly information. Such a phenomenon negatively affects a nation’s potential to advance and foster innovation in knowledge and comprehension (Lachenmayer, 2019). To provide some context, Lachenmayer (2019:3) explains that:

“In the 1970s, the US government was responsible for producing more than half the databases, meaning that much of this information lived in the public domain, making it freely accessible to libraries and researchers. Presently, corporations are responsible for over 80% of databases, with the top five journal publishers (Sage, Elsevier, Wiley-Blackwell, Springer, and Taylor & Francis) responsible for over 50% of the journals and, therefore, research that resides in these databases”.

According to Lachenmayer (2019), Pergamon Press established in 1951, became the first publisher to monopolise the academic print publishing market, registering a 47% profit margin in 1985. In 1991, PP had 400 academic journals and was acquired by Elsevier, thus bringing the total number of journals owned by Elsevier to 1,000 titles (Lachenmayer, 2019).

Lachenmayer (2019) opines that this acquisition made Elsevier the world's leading scientific publisher. As of 2010, Elsevier had a profit margin of 35.7%. Currently, Elsevier publishes 420,000 peer-reviewed articles annually. In addition to this, Elsevier was responsible for 16% of all scientific articles published in 2018 (Lachenmayer, 2019). Elsevier was, thus, the dominant publisher, particularly in the Science Technology and Medicine (STM) fields. As a consequence of this, Elsevier charges unreasonably high prices for subscriptions to its journal packages. Many libraries find this pricing unaffordable, and consequently, researchers are deprived of access to Elsevier content (Lachenmayer, 2019).

Tamber (2000) earlier demonstrated that mergers were prevalent in the professional publishing industry between January 1998 and June 1999. Wolters Kluwer acquired Ovid Technologies and Plenum Publishing in 1998. However, Tamber (2000) reports that the US antitrust authorities halted Wolters Kluwer's attempt to merge with Harcourt's medical division in 1998. During that time, Harcourt was ranked as the sixth-largest publisher in revenue, while Wolters Kluwer ranked third.

The Antitrust authorities also stopped the Reed Elsevier merger with Wolters Kluwer. Tamber (2000:1) records that in 1998, Reed Elsevier, "the second largest publisher proposed to merge with Wolters Kluwer, and this did not materialise." Consequently, had the merger been successful, the combined entity would have emerged as a formidable force in the publishing profession. The two companies, however, continued to acquire smaller companies. Between January 1998 and June 1999, Elsevier was ranked first among science/technology publishers in the USA in revenue and the number of published journals (Tamber, 2000).

Although librarians view mergers as benefiting publishers, it is essential to note that publishers perceive mergers as benefiting consumers. Publishers argue that larger profitable companies can be safe and reliable for long-term relationships, while profits reflect the company's better understanding of the market (Wyly, 1998). David Prosser, cited in Jump (2015:3), disagrees with the publishers' argument and states that:

"Mergers always seem to result in prices being harmonised upwards, mergers mean 'big deals' – multi-year contracts for publishers' entire electronic catalogues –get bigger, reducing libraries' budget flexibility and potentially squeezing smaller publishers out when cuts have to be made".

In an earlier study, McCabe (1999) found that following the 1991 Reed Elsevier and PP merger, prices for PP titles increased by an average of 22% and 8% for Elsevier titles. Bergstrom (2010) agrees, positing that a series of mergers in the US resulted in four companies controlling 70% of college textbook sales, and in turn, textbook prices rose to twice the inflation rate. Individual journal titles or package prices rose by over twice the annual inflation rate. Supporting this notion, Reich (2000) emphasises that librarians see mergers as detrimental to diversity, as they result in more limited markets where certain companies become providers and publishers of academic content. Budd (2002) and Tamber (2000) further amplify this concern by viewing mergers as reducing competition within a naturally low competitive market. Where there is insufficient competition, Bergstrom (2010) argues that publishers can raise their prices without significantly reducing sales. This motivates publishers to merge so as to reduce price competition.

Professor Mark J McCabe, an economics professor at the Georgia Institute of Technology, illustrated Tamber's (2000) point by explaining that if a market has two sellers, merging them will be harmful because the resultant company can fix prices and restrict supply unopposed. The Association of Research Libraries (ARL) in 2000 estimated that its members spent 179% more on journals than in 1986. However, despite this increase in expenditure, the ARL observed a 6% decrease in the number of titles purchased during the same period (Science and Technology, 2000).

In 2015, librarians warned that the merger of Macmillan Science and Education and Springer could increase journal prices. Phil Sykes, a university librarian at the University of Liverpool, cited in Jump's (2015) study, concurs and highlights the negative impact of mergers on universities. Mergers increase the power of publishers in a market that already lacks competition, thus allowing arbitrary pricing of resources. To put this into perspective, it is worth mentioning that between 2009 and 2013, Springer and Macmillan published 13% of the papers indexed in Thomson Reuters' Web of Science. Elsevier published 23% of articles in the same period.

Tamber (2000) asserts that scientific information is a need-to-know inelastic product, which forces libraries to continue with subscriptions despite drastic price increases. In order to maximise the value of their subscriptions, publishers divide journals into broad- and niche-based titles. Broad titles cater to a wider readership, are heavily used and have a low cost/use

ratio. Niche titles, on the other hand, are found in specialised libraries, are less used and have a high cost/use ratio. McCabe (2001) observes that libraries must cater to a variety of users, so they opt for broad-based titles and very few niche titles. Specialised libraries have no choice but to purchase relevant titles, even at a higher cost, thus enabling the publishers to maximise profits. This practice of selling less for more proves more profitable than selling more for less. According to Tamber (2000), if this is true, publishers restrict the dissemination of scientific information for commercial gain, capitalising on the researcher's desire for prestige. This phenomenon was further explored in the following narrative.

According to some scholars, such as Bergstrom (2010), Budd (2002), Jump (2015), McCabe (2001), Reich (2000), Tamber (2000) and Wyly (1998), mergers generally result in price increases. It is, thus, crucial to focus on finding ways to maintain affordable pricing. Shulenburger (1999) earlier noted the need to make scholarly communication affordable by reducing prices to competitive levels, rather than slowing down the rate of price increase. Additionally, Wyly (1998) points out that competition in professional publishing is hindered by the fact that authors are encouraged to publish in high-impact journals without considering the cost of the journal to the readers.

3.2.2 Publishers' profit-focused behaviour

While libraries face budget cuts and are busy cancelling resources, Bosch, Albee & Romaine (2019) and Johnson, Watkinson & Mabe (2018) note how publishers focus on profit-making and recording growing profits. There is a need for libraries and publishers to work together so that researchers continue to access resources in an economically sustainable environment. Hunter & Bruning (2010:151) posit that publishers must respond to fiscal challenges affecting libraries in a "spirit of collaboration and mutual problem solving". However, the reality is that publishers are solely focused on their profit margins.

According to Johnson, Watkinson & Mabe (2018), the English language STM journal publishers generated annual revenues of approximately United States Dollar (USD)10 billion in 2017 within a broader STM information publishing market worth some USD25.7 billion. These publishers have established an inelastic demand due to their unique content, which Bergstrom (2010) considers a paradise for monopolists. In 2010, while the non-profit societies were adjusting prices in response to the recession and library budget cuts, Bergstrom (2010)

observes that Elsevier and Springer increased their 2010 subscription prices by an average of about 5%.

According to Bergstrom (2010), before 1990, journals were only available in print format, and publishers charged the same price to small and large universities. The difference between the universities was in the quantity of copies purchased, with large university libraries purchasing more than small libraries. The introduction of electronic journals led to the emergence of ‘big deals’, which opened access to all the publishers’ journals on a site license. This allowed students and academics unlimited access to electronic journals. Libraries initially viewed this as a positive development as it gave them access to both subscribed and non-subscribed content and print journals. However, publishers saw the bundling pricing as a strategy to maintain market dominance by discouraging competition from new journals published by competing publishers, as most library budgets were going towards big deals (Bergstrom, 2010).

Librarians soon realised that the 7% annual increase built into the Elsevier five-year contracts meant a 40% increase. In contrast, the US consumer price index rose by only 13% (Bergstrom, 2010). In the subscription model, the publishers knew that librarians would not walk away or drive a hard bargain at renewal time, as academics were now used to online access. However, as librarians started exploring OA as a solution to ever-increasing subscription prices, the publishers swiftly identified the financial benefits of OA. In fact, publishers now consider OA as another income revenue stream (Bosch, Albee & Romaine, 2019).

According to Bosch, Albee & Romaine's (2019) findings, the three leading companies in traditional subscription publishing started leading Article Processing Charges (APCs)-funded OA journals. Chen (2019) concurs, reporting that publishers were seen to increase paper acceptances without thorough vetting. This was evidenced by the number of errors in the Chinese-authored papers in Web of Science, which increased from two in 1996 to a staggering 1,234 in 2016. This increase shows that publishers accepted articles from Chinese authors who received substantial financial incentives to publish. In addition, Chen (2019) reports that in 2018, China overtook the USA in terms of scientific publications, as confirmed by the US National Science Foundation statistics. The Nature Index’s ranking also confirmed this by institution, which placed the Chinese Academy of Sciences first, with 15 of the top 100 universities in this ranking being from China. Chen (2019) reports that the Jiupin Culture’s Baidu Encyclopedia, a paper mill, claims that their employees, who also serve as journal

editors, have authored around 100 journals. One example of a compromised OA journal is the *Seeker* story, which is not supposed to charge authors' fees. However, between 2009 and 2015, it collected CNY 2,000,000 from author fees, indicating the publisher's clear focus on maximising profit. Chen (2019) observes that specific journals adopt a strategy of publishing many issues, with each issue containing hundreds of articles to maximize profit. For instance, Chen (2019) looked at *Science and Technology*, a Chinese national critical journal with an impact factor of 0.5, confirming that it published 36 issues every year and issue 36 in 2011 had 146 articles. This shows that publishers will continue to maximise their profits even with the new publishing and access models. To prevent libraries from comparing pricing and weakening their negotiating power, the publishers enter into non-disclosure license agreements with libraries.

3.2.3 Secrecy clauses in License agreements

As mentioned earlier, libraries sign non-disclosure clauses on price confidentiality, restricting them from sharing pricing information with other libraries. According to McGrath (2010), this practice was predominantly adopted by large commercial publishers to strengthen their quasi-monopolistic power. Consequently, libraries face a disadvantage in price negotiations as they lack comparative pricing and have to accept the pricing the publishers offer them.

The library needs to know the prices charged to other libraries so that they can bargain from an informed position. For example, in the USA, Bergstrom (2010) reports that implementing the Freedom of Information laws helped obtain pricing information from libraries for research even though Elsevier attempted to prevent libraries from disclosing this information. Similarly, Karlstrom (2019) highlights the importance of the rights of the Norwegian Public Act and Public Administration Act in enabling the Norwegian Unit to share the Elsevier license and OA terms and publicise the agreement on their website.

However, no such laws exist in SA, and publishers continue to thrive through obscure pricing models. The researcher believes the solution to this problem does not rest with the publishers. The focus must be shifted from the publishers to the researchers/scientists/academics themselves as creators of the research that publishers exploit for profit.

3.2.4 Researchers

There is an unusual business arrangement between the scientists and publishers. According to Crowe (2019), researchers who receive public funding provide content for journals without compensation from the publishers. They write, edit and peer-review papers, while publishers profit by publishing the research and charging substantial subscription fees, which increase annually. Crowe (2019:3) confirms this by reporting that in 2018, “Canadian university libraries paid \$300 million for subscriptions to research journals, including those containing papers generated by their professors.” When budgets were cut, some Canadian libraries cancelled packages, leaving their students without access to research published by their professors or by universities close to them, for example, University of Calgary failing to access research published by University of British Columbia.

According to Crowe (2019), there is not much that the researchers can do due to the rule of publish or perish, reinforcing the power of for-profit academic publishing. There is a perception that for-profit publishers offer quality research. Shulenburg (1999) earlier agreed with this perception and stated that any university whose academics do not publish in high-impact journals must reconsider its position. In agreement, Eisen (2003) and Murphy (2016) report that scientists are judged by where they publish when competing for jobs, promotions, tenure and grant money. The publish or perish syndrome requires researchers/scientists to publish to further their careers (Science and Technology, 2000).

According to Chen (2019), China has offered generous cash-per-publication rewards to authors who publish in high-impact factor journals since the late 1990s. Shandong University of Technology authors received the following specific reward levels for specific kinds of research outcomes:

- “CNY 1,000,000 (about (USD) 150, 000): major national research grants winners.
- CNY 500,000 (about USD 75,000): the first author or corresponding author of an article in any of the following three journals: Nature, Science and Cell.
- CNY 100,000 (about USD 15,400: the first author or corresponding author of an article in the journals published by the same publisher of Nature, Science and Cell with an impact factor ten or higher (Chen, 2019:2).”

Wuhan University offers rewards like Shandong University of Technology, while Soochow University offers half the rewards in cash and the other half in research grants. It does not require the authors to be the first or corresponding authors for them to qualify for the reward. Authors who publish in lower impact factors journals receive less in terms of rewards. Financial rewards for 100 Chinese universities depend on the university policies and budget but range from USD30 to USD 165,000 per paper indexed in the Web of Science.

In SA, the Department of Higher Education and Training (DHET) funds academics to publish their research in prestigious, high-impact overseas journals (CHELSA et al., 2014). Consequently, SA academics continue to publish in these prescribed journals to advance their careers, despite their dissatisfaction with the excessive power held by the publishers (CHELSA et al., 2014; Science and Technology, 2000). As a result, commercial or mainstream publishers get market power and enjoy the monopoly of publishing highly priced research that was freely received from the scholarly community (Tapfuma & Hoskins, 2019). Addressing this issue, Pells (2019) argues that this attitude is a barrier to OA and needs to be addressed with publishers, researchers/scientist and institutions that still give prominence to the journal impact factor as a single metric for assessing output and quality.

According to Tamber (2000), prestige-seeking researchers enabled, perpetuated and consolidated anti-competitive behaviour. Chen (2019:2) observes that,

“the number of articles published in high-impact journals has become key bragging rights in public relations and college rankings, and at the international level, this has also become China’s national pride in research.”

This desire for prestige resulted in scientists weakening their voice, losing control of the need-to-know information and empowering publishers to do as they please and, worse still, engaging in what Chen (2019) called academic misconduct.

The prevalence of academic misconduct in China is a significant concern. Professors, doctors and scientists in China utilise their substantial funding to pay paper mills to write and publish research papers on their behalf. Chen (2019) highlights the disconcerting fact that data from other countries were not only falsified or fabricated, but also the paper mills conducted reviews. This issue was brought to the fore in 2017 when Tumor Biology, a then SCI-indexed journal by Springer, retracted 107 articles by Chinese authors. The investigation done by China’s Ministry of Science and Technology revealed that 101 of the 107 retracted articles were fixed

by paper mills. Twelve of the 107 papers were written by paper mills, while 95 had fake reviews by paper mills (Chen, 2019). In other instances, authors admitted that they did not conduct the experiments documented in their articles.

Chen (2019) explains that paper mills in China are legally operating entities that employ writers who write and publish for authors in regular and key journals for a fee. However, as Chen (2019) points out, China has high-quality publications but relatively low quality, as the research lacks significant innovations and new products. Chen (2019) urges librarians to be cognisant of scientists' and publishers' fraudulent papers, which anti-plagiarism software cannot detect. Therefore, carefully selecting subscription titles for information literacy classrooms and targeted marketing journals to academics is needed, as some academics might be unaware of these issues and push for subscriptions.

While this narrative suggests that scientists/academics/researchers are empowering publishers and helping them publish and charge as they please, Hunter & Bruning (2010) disagree and argue that the library budgeting process is to blame, as budgets have not kept up with the growth in research. During the period 1998 to 2007, the number of researches and papers published increased by 3 to 3.5%, while the library spent as a proportion of many universities declined from 3% to 2.2% (Hunter & Bruning, 2010). These arguments point to different causes of shrinking budgets, but both confirm that budgets are shrinking. Thus, the aim of the present study was how to optimise the budgets.

3.2.5 Exchange rate fluctuations

Kidd (2010) observes that the international nature of research and scholarly communication and the publishing industry strongly influence exchange rates. Exchange rate changes, primarily caused by weakening the budgeting currency value, are viewed as synonymous with budget cuts (Kidd, 2010). In 2010, libraries in the UK experienced a 30% exchange rate loss when their budgets were only increased by 10 to 12%. Poland experienced a 40 to 50% exchange rate loss in 2008-9, while Sweden experienced a 35% depreciation in the currency, and Canada experienced a 20% decline. As a result, Canadian libraries faced budget reductions of up to 70% (Hunter & Bruning, 2010). Kidd (2010) explains that although exchange rate movements are to be expected, the sudden and significant changes affecting major currencies simultaneously, and the monthly variations, have been problematic to libraries.

In SA, Glenn Truran, the SANLiC Director, reported in Wild (2016) that in 2015, the Rand lost close to 40% of its value against the dollar, and libraries were in severe financial difficulty. However, currency fluctuations are not unique to SA or the SARULs under this study. According to Corbyn (2009), the value of the Pound was causing significant budgetary challenges for UK Universities. Since July 2008, the Pound had fallen by approximately 25% against the Dollar and the Euro, making it difficult for libraries at research-intensive universities to manage their information resources budget. An example was the Research Libraries UK (RLUK) and the Research Information Network (RIN), libraries that spend 75% of their information resources budget on journals (Corbyn, 2009).

Additionally, Kidd, cited in Corbyn (2009), describes how Glasgow University library had to ask for additional 'exchange rate funding' of more than 400,000.00 Pounds in 2009. The cost of journals in USD increased from 25% of the budget in 2008 to 37%, and Euro-priced journals increased from 40% to 59%. Corbyn (2009) estimates that when the Pound weakened by a cent to the Euro or USD over a year, the library costs would increase by 12,000 Pounds and 7,000 Pounds respectively, thus affecting libraries more than other departments within the university.

Kidd (2010) and Wild (2016) illustrate the decline in purchasing power caused by the exchange rate. In UK libraries, the Pound fluctuated from Euro1.51 in January 2007 to Euro1.09 in January 2009, resulting in a 38.5% price increase. Similarly, the dollar's value declined from USD2.00 in March 2008 to USD1.42 in March 2009, representing a 41% price increase in one year. In SA, Wild (2016) found that the Rand weakened from 12.50 to the USD in October 2015 when budgeting for 2016 was done. By the time the 2016 invoices were received, the Rand had weakened to R16 or R17 to the USD and R21 to the Pound. Using Kidd's (2010) calculation, the South African scenario translated to a 33% price increase for 2016. Kidd adds that this increase was in addition to continuing journal price inflations. These unsustainably high price increases in austerity environments constitute a significant concern.

3.2.6 Price increases

In 2000, Reed Elsevier announced the new Elsevier, which would not have double-digit price increases. The increases were 7.5% and the following year 6.5%. However, Tamber (2000) points out that these increases only inflated the price of journals like *Brain Research*, which had a starting price of USD16,344 yearly. Indeed, price increases differ, with commercial

publishers having higher rates than societies and association publishers (Budd, 2002). Disapproving, Shulenburger (1999) notes that not-for-profit publishers have realised they have something of great value to sell and are beginning to convert that value into more significant financial support for their societies. To illustrate this, Shulenburger (1999:4) presents the 1994-1998 University of Kansas (KU) data below:

“At KU, from 1994 to 1998 the unit cost of journals published by not-for-profit publishers went up by 34.16%. While this is sharply lower than the 56.63 increase of the for-profit published journals in our collection in this same period, it is dramatically higher—three times higher—than the 10.58% increase in the U.S. Consumer Price Index for this same period.”

This is evidence that the not-for-profit publishers are now cognisant of the worth of scholarship and are beginning to exploit it.

This inclination seems likely to persist in the near future, as indicated by the EBSCO (2018) and 2019 Serials Price Projections Reports, which state that a 5 to 6% increase in publisher-base currencies is acceptable for journals. Bosch, Albee & Romaine (2019) concur, reporting that the 6% average price increase that started in 2012 was expected to continue into 2020. If library budgets remain flat or decrease in future years, as reported by Davis (2014), Flesch (1997) and Miller-Francisco (2003), it is reasonable to expect that increases of this magnitude will not be sustainable. This, thus, brings a different narrative of the optimisation strategies adopted by libraries.

According to Davis (2014), libraries are expected to operate within their financial means, while Weir (2010) notes that with the realisation that academic libraries are facing budget cuts, librarians must consider strategies to maintain their viability. Fleming (2015) recommends viewing library budgets as flexible constructs influenced by time and funding constraints rather than fixed entities. Therefore, universities would benefit from approaching library budgets as an enabling tool rather than as definite facts. It is encouraging to note that LDs, according to Nicholas et al. (2010:382), are:

“Open to the suggestion that they should find ways of doing things differently, and many of them see budget cuts as an opportunity to re-think what the library does and what it means”.

Murphy & Buckley (2018) note that while library resource prices outpace inflation, library budgets remain stagnant or shrink. Libraries, therefore, need to seek innovative ways to control

spending while providing patrons with high-quality content, referred to as optimisation strategies in this study.

3.3 Optimisation strategies

The shrinking of library resources in the SARULs environment can be attributed to various factors, including budget allocation cuts, publisher mergers, currency fluctuations, researchers' mindsets, and publisher price increases, as discussed. It is crucial to identify sustainable optimisation strategies. As noted by Sabela (2012), the ability to adapt to economic and market volatility is critical for the survival of an organisation and for maintaining its competitive edge. In SA, the cancellation of resources has generated significant backlash from academics, with some resorting to personal attacks and sending abusive emails to LDs.

This experience was not peculiar to SA, as Trail (2013:214) has this email on record from an academic at the Richard Stockton College of New Jersey in the USA:

“If this bleeding does not stop and our library expand, not contract, I will not be able to do the research/community side of my job effectively anymore – I truly mean this...the library is substandard already for my research needs.”

What is important to note is that libraries are willing to solve the budget problems, as observed by Bosch, Albee & Romaine (2019), Collins (2012), Guarria & Wang (2011), Hoeve (2019), Peters (2018), Sinha, Tucker & Scherlen (2005) and Trail (2013). Therefore, it is pertinent to prioritise the training and upskilling of librarians, referred to as Batho Pele (Mojapelo, Modiba & Saurombe, 2023). According to Appleton (2018), libraries are continually evolving, and librarians must continually develop their professional and technical skills to be competent and confident in embracing the required changes. The focus of this current study was the different ways in which libraries are trying to solve their budget problems, referred to as the optimisation strategies described below.

3.3.1 Trade-offs

The University of Nevada, Las Vegas offered a policy called the ‘add one-cancel one’ rule (Sinha, Tucker & Scherlen, 2005:121). Under this rule, a new subscription had to be balanced with cancelling another subscription of equal value. The savings realised from cancelled resources would cater for pending new resource requests from faculty. Sinha, Tucker &

Scherlen (2005) report that to improve the policy's acceptability, UNLV shifted away from using the word 'cancellation' and instead used 'review'. This change empowered the faculty to make decisions regarding the prioritisation and ranking of their journals, thus facilitating cancellations of the less critical resources.

3.3.2 Cancelling of big deals

There is a general feeling that big deals have failed to bring budget solutions to libraries. According to Frazier (2005), even the most cost-effective big deals were no longer financially sustainable. To illustrate the unsustainability of big deals, Bergstrom (2010:4) reports:

“The first round of Big Deal contracts with Elsevier was signed shortly before the turn of the millennium. As these contracts expired, the Big Deals were not as compelling a bargain as they had been when first signed. The 7% compounded annual increase built into these five-year contracts meant a 40% increase in the subscription price over the life of the contract”.

Based on the review of the literature, it was found that libraries experienced a significant increase in cost for big deal contracts over ten years. Specifically, a library that signed a big deal contract in 1999 would pay about 80% more in 2009 (Bergstrom, 2010). Bosch, Albee & Romaine (2019) agree and state that big deal cancellations were becoming more common when libraries faced budget cuts.

Several institutions, including the consortia in Hungary and Finland, the Florida State University, the University of Oklahoma and the Max Planck Society, decided to cancel their big deals. Guarria & Wang (2011) observe that in response to reduced funding, the California State University offered early retirement, froze the hiring of new staff and delayed some projects in 2011. In February 2019, California University (UC) cancelled its subscription with Elsevier. An important observation is that the UC Academic Senate endorsed UC's position to terminate this big deal with Elsevier (Bosch, Albee & Romaine 2019). By the end of September 2019, the ARLs' Scholarly Publishing and Academic Resources Coalition (SPARC) site had listed 53 institutions, including 40 universities, four societies and eight consortia that had cancelled big deals (Scholarly Publishing and Academic Resources Coalition, 2019).

Cancelling big deals allowed libraries to invest in collections that are not available anywhere else. This created a unique selling point for their universities and improved access to research

(Peters, 2018). Bergstrom (2010) emphasises the necessity for more libraries to discontinue big deals to have a meaningful impact. Libraries must be clear on what will happen in case of no deal. Bergstrom (2010) outlines the alternative options, which included retaining highly utilised journals, using inter-library loans (ILL) for other requests, looking for free copies on authors' websites, writing emails to request articles from authors or using pay-per-view (PPV).

Hoeve (2019) reports that with a targeted cut of USD 285,000.00 at the Kansas State University (KSU) in the USA for the 2018 fiscal year renewals, there was a need for broader participation and transparency in balancing the libraries' collection and budget. All packages need to be broken apart, and journals subscribed individually by the publisher.

In order to identify resources to cancel, KSU used qualitative and quantitative metrics. For the quantitative metrics, a spreadsheet was created, listing all subscribed journals, with columns added for usage data cost and access options. The usage was mainly the Successful Full-Text Article Request (SFTAR). The cost per use was then calculated based on the usage. The availability of alternative access options in existing subscribed databases was also checked. The spreadsheet also indicated any embargoes and subscription gaps for each journal title. Cancellation lists were created based on low usage, high cost per use and duplicate titles.

For the qualitative assessment, KSU sought to gather feedback from academics and students before any cancellation. Reasonable feedback was received, including accreditation, information literacy instruction, contribution to KSU's 2025 strategic goals and crucial journals to support the curriculum and faculty research and proposal to include journal impact factors in future (Hoeve, 2019). The decision to renew or cancel resources was based on quantitative and qualitative data. All titles with a comment were renewed, but a portion of the monograph allocation was cut to remain within the allocated budget. Hoeve (2019) reports posting a list of the cancelled resources on the library website to encourage faculties to participate in cancellation projects and to demonstrate to the university administration the negative effect of library budget cuts. According to Guarria & Wang (2011) Massachusetts Institute of Technology (MIT) officially closed two branches, laid off six staff members, and reduced staff working hours or pay due in response to budget cuts. When libraries face budget cuts, cancellations often occur without checking if they have post-cancellation access to the resources. Peters (2018) emphasises that libraries need to be confident of their post-cancellation access rights to content subscribed to in the past before they cancel.

For post-cancellation access rights, subscription to services such as Controlled Lots of Copies Keep Stuff Safe (CLOCKSS), Lots of Copies Keep Stuff Safe (LOCKSS), or Portico, a digital preservation service or via IR, was essential in ensuring that digital publishing output was stored safely. In the UK, the United Kingdom Research Reserve offered a national collection of print journals as a safe archive to all university libraries. Libraries could discard print journals that they no longer needed. The monograph equivalent service was proposed, but the success depended on the universities' readiness to fund it (Peters, 2018).

3.3.3 Open Access (OA)

Lachenmayer (2019) presents (OA) as an optimisation strategy enabled by information communication technologies (ICTs). The concept of OA was formed through various initiatives, such as the Budapest OA initiative in February 2002, the Bethesda Statement on OA Publishing in June 2003, and the Berlin Declaration on OA to knowledge in the Sciences and Humanities in October 2003. OA literature is digital, online, free of charge, and freely accessible without most copyright and licensing restrictions (Suber, 2012). By eliminating cost and copyright barriers, OA facilitates access to academic content. While legitimate OA routes were encouraged, scholars like Ovadia (2014) report that academic social networks (ASN), which publishers view as illegitimate, were good as these sites were used to share papers and data sets freely. Using these sites would, thus, save library budgets. However, publishers, specifically Elsevier, were fighting legitimate and illegitimate sites by purchasing Mendeley and the social sciences research network (SSRN) and sending takedown requests to Academic. Educ and raising lawsuits against Sci-Hub (Bjork, 2017; Leeper, 2016).

With the shrinking library budgets, OA has been seen as a route to saving library budgets due to its promise of public enrichment and accelerated discovery (Bosch, Albee & Romaine, 2019). As Schneider (2018) puts it, even with unlimited budgets that could bear all the expenses imposed by profiteering publishers, there is a compelling reason to transform the current scholarly communication system. Schneider (personal communication, 2018) posits that OA ensures that the taxpayer's money gets spent ethically, morally and socially responsibly and expressly for the greater good (Schneider, 2018). However, the OA uptake in the global south is more deficient when compared to the global north. Bawack & Nkolo (2018) illustrate the global apprentice South by providing evidence of one African country among the top ten contributors of OA journal in the Directory of Open Access Journals. While the top ten

countries contributed more than 250 journals each out of 11,408 OA journals from 126 countries, Cameroon was at the bottom, with one journal.

3.3.4 Transformative agreements (TA)

TA represents a paradigm shift, as it transfers the cost of publishing from readers to authors of research papers (Matthews, 2019a). With the TA model, libraries do not pay subscription fees; users can access all the journals as they are OA. However, the savings through TA depend on the size and type of university the library serves. Matthews (2019a) states that research-intensive universities, which publish prolifically, will incur higher costs in future, whereas teaching universities that do not publish will have very little to no costs. In fact, Matthews (2019b) found that German research universities expected a 50% increase in publishing costs, while smaller teaching universities will realise a saving under the Springer Nature TA model.

TA does not seem to be saving library budgets. While Matthews (2019a) reports rising costs for German research universities, Karlstrom (2019) cites another cost increase for Norwegian universities. The Elsevier deal with Norwegian institutions allowed 1,850 articles to be published in Science Direct. However, it excluded approximately “400 society-owned journals and 47 journals in Cell Press and Lancet” (Karlstrom, 2019:2). If Norway's institution exceeds the 1,850 article limit or wants to publish in excluded journals, Elsevier will charge normal APCs. Furthermore, an unused balance from the permitted number of articles does not carry over to the following year. It is evident that Elsevier's terms do not provide any cost savings to library budgets but rather safeguard publisher profits.

Regarding the APCs for the Springer Nature TA, Matthews (2019a) observes that the APC of Euro2,750 was calculated so that German universities would end up paying roughly the exact amounts to Springer Nature as they did during the subscription model. However, users would now have access to a more significant number of titles. It is worth noting that the agreement excludes Nature and other Nature-branded subscription journals.

3.3.5 Plan S

Plan S, a mandated OA, stipulates that all scientific research funded by public sources should be published in OA journals or on OA platforms starting in 2020 (Bosch, Albee & Romaine, 2019). Plan S was launched in Europe to provide immediate free access to research.

The University of California (UC) librarian said that publishing behind a paywall deprives people of access to and benefits of publicly funded research. Three public funders in Canada support this position. According to Crowe (2019), the three major research funders in Canada, the Canadian Institutes of Health Research, the Natural Sciences and Engineering Research Council, and the Social Sciences and Humanities Research Council of Canada now require scholars to publish OA as a condition for getting grants (University of California office of the President, 2019). In support of this, the UC Digital Library Associate executive director and co-chair of UC's negotiating team notes that OA enables faster global equity of access to new research.

Plan S aims to save library budgets and provide free resource access. However, publishers seem to have a different agenda, as noted by Matthews (2019c), who exposes their tactics of launching mirror journals that imitate existing subscription-based titles in an OA format. These mirror journals replicate the title and editorial board of the original journals. Such publisher behaviour raises concerns about their sincerity in negotiations. It is, therefore, reasonable to think that no real savings will be achieved through Plan S. Realising this shortfall, the Max Planck Society started a European Initiative known as the OA2020.

3.3.6 OA2020

OA2020 aims to transform subscription journals into OA publishing (Bosch, Albee & Romaine, 2019). By 2019, OA2020 had more than 700 policies and mandates worldwide from different institutions and funding bodies. Although the STM disciplines quickly adopted Gold OA, the humanities and social sciences have been slower due to limited funding opportunities.

Peters (2018) explains that libraries could maximise OA content use by making them available on their catalogues, establishing support for OA publishing or creating a university press. Regarding the university research output, libraries need to ensure that managing their unique content in the IR is of a high standard as far as archiving is concerned. Additionally, libraries

must manage their university research data to preserve the digital legacy for future generations (Peters, 2018). The evaluation of scientists' research outputs based on the prestigious journals they publish in, and the impact factor, needs to change for OA to succeed.

According to Bosch, Albee & Romaine (2019), the disadvantage of OA, especially Plan S, is that it might not decrease the costs of publishing research. Bosch, Albee & Romaine (2019) explain that the APC model encourages quantity over quality, as the more articles published, the more revenue is generated. The resultant scenario will be that the cost of APCs will continue to rise, or publishers will increase the number of accepted and published articles if they are forced to apply price caps to APCs. This will be done for publishers to ensure their revenue streams. When this happens, Bosch, Albee & Romaine (2019) explain that libraries may not be able to fund every discipline and, thus, resort to selective funding that excludes highly-rated and research-active disciplines that have greater access to research funding. Therefore, Bosch, Albee & Romaine (2019) conclude that OA will change how research is created and accessed. Still, it is unclear if it will reduce library expenditure or change how commercial publishers dominate the market.

3.3.7 National Electronic Article Repository (NEAR)

As an essential optimisation strategy, Shulenburg (1999) earlier suggested that scholarship must be part of the public domain since academic journals contain valuable scholarly work with real economic value. Therefore, publishers should not have full copyright ownership. Instead, the current practice of transferring copyright ownership from the author to the publisher upon acceptance of a manuscript should be stopped. In the US, the proposed change allowed authors to retain the right to include their manuscript in NEAR within 90 days of publication. NEAR would index the manuscript by author, title, subject and publishing journal, ensuring the article is permanently archived and easily searchable.

The funding for NEAR would come from the universities through government appropriation or other income streams (Shulenburg, 1999). For NEAR to succeed, the US government must pass a law requiring all US university faculty members' work to be published in scholarly journals and deposited in NEAR within ninety days. In conclusion, Shulenburg (1999) states that free or low-cost access after ninety days would curb the high prices and increase those prices without limits by some journals or publishers.

Although it would be reasonable to think that NEAR was a good move, not everyone viewed it as a way to control pricing strategy. MIT Press cautions that depositing articles in NEAR just 90 days after publication would leave publishers with little time to recoup their initial expenses. This would increase publishers' prices for the remaining subscribers (Shulenburg, 1999). Humanities and social sciences publishers were also concerned that the resolution meant for the science, technology and medical publishers would also impact them (Shulenburg, 1999).

3.3.8 Institutional Repositories (IR)

Libraries have adopted IR not necessarily to save budgets but to increase access, availability and visibility of their institutional research output to a broader readership (Tapfuma & Hoskins, 2019). Publishers make their money during the embargo period, and IR will make the research available for free.

3.3.9 Consortia

For the Welsh university, Peters (2018:3) notes that working with consortia was successful, particularly in the joint purchasing of the Library Management System (LMS), which realised a saving of “GBP226,000 in the first two years, plus GBP55,000 on procurement costs compared with purchasing independently.” For books, purchasing Welsh universities used the Southern Universities Purchasing Consortium and the Joint Information Systems Committee (JISC) Collections for journals. According to Peters (2018), it is crucial to work together when budgets shrink if an adequate, lower-cost infrastructure for scholarly communications is to be created. Sponsoring Consortium for Open Access Publishing in Particle Physics (SCOAP³) is another success story. SCOAP³ was started by the European Organisation for Nuclear Research, known as CERN. CERN negotiated APCs with publishers of high-energy physics journals and then encouraged libraries to convert their subscription spending on specific high-energy physics journals to APC expenditure.

However, a challenge arose when negotiating with publishers for purchasing/subscription to resources without the advantage of all group members. This happens when the content subscription is irrelevant to some members, and paying for that content, no matter how small the amount, becomes uneconomic. Conversely, publishers are willing to discuss ‘all in deals’.

3.3.10 Shared Storage Facilities

To save on budgets, libraries are moving to collaboration on storage facilities. According to (Peters, 2018), in Wales, UK, there have been different initiatives from local, regional, and national levels, which resulted in libraries getting some free metres of shelf space for study spaces. The challenges of this initiative were the cost of building or renting, ownership of content, creation of distribution services, and the facility's funding in terms of human resources. Although keeping print resources in storage is regarded as a good idea, Peters (2018) disagrees and states that Hathi Trust and the Digital Public Library of America offer access to digital content at the international level. This study will review whether a shared storage facility can be taken as an optimisation strategy for the SARULs. SARULs do not have a shared storage facility, although conversations around this facility are starting.

3.3.11 Just-in-Time Acquisition Models

Jarvis & Gregory (2016) and Murphy & Buckley (2018) note that the conventional subscription and acquisition models become unsustainable when faced with high inflationary costs and stagnant library budgets. There is, therefore, a need to look at new models that are helpful in the current austerity environment. According to Murphy & Buckley (2018), librarians must find sustainable alternatives to subscriptions that provide fast, reliable, and affordable access to full-text articles. Murphy & Buckley (2018) note that most libraries adopt Patron Driven Acquisition (PDA) for eBooks, Core Plus Peripheral (CPP), Document delivery (DD) subscription and Article-Level Access (ALA)/PPV access (PPV) for high cost per use journals or unsubscribed journal content. Jarvis & Gregory (2016) refer to these new models of library collection development as 'Just in time' rather than the 'just in case' traditional model. This study will discuss these models as optimisation strategies.

3.3.12 Document delivery (DD)

DD serves as an effective way of filling the gaps caused by serial cancellations. Murphy & Buckley (2018) list five commercial DD companies: Get it Now, A-Z Academic Article Collection, ReadCube Access, DeepDyve, and Ingenta Connect, which supply libraries with content from multiple publishers. Get it Now from the Copyright Clearance Center, which started in 2011, provides PDF articles 24/7 from 17,000 academic journals from 130 publishers in less than 15 minutes, at an average cost of USD26.64 per article.

A-Z Academic Article collection from Reprints Desk started in 2008 and supplies PDF articles 24/7 from 40,000 journals from 100 publishers in a few minutes, at an average cost of USD30 per article. Get it Now, and A-Z Academic Article collection were regarded by Murphy & Buckley (2018) as better-known options for DD. According to Murphy and Buckley, Ingenta Connect also offers a DD service for over 13,000 publications, but it is not at par with Get it Now and A-Z Academic.

ReadCube supports the demand-driven acquisition for institutions and consortia-based purchasing pools that are pre-set and monitored. At the same time, DeepDyve is a rental model for researchers, which offers five-minute free previews of over 100 publications (Murphy & Buckley, 2018). Murphy & Buckley (2018:242) suggest integrating DD of these PPV articles:

“with the library’s Open URL link resolver so that individual high-quality portable document file (pdf) versions of articles may be seamlessly requested and received by users with minimal intervention by library staff.”

To contain the cost, Murphy & Buckley (2018) propose that this process can be unmediated with some limits or mediated by library staff. It would also help to use ILL instead of DD, where it makes economic sense and when ILL delivery time is acceptable. ILL costs are approximately USD30, while DD charges for articles average USD24 to USD51, based on Illinois State University’s experience (Murphy & Buckley, 2018). It would make economic sense to cancel resources with a cost per use greater than USD30 - USD50 and get them through ILL or DD. Murphy & Buckley (2018) illustrate this using an example of a journal costing USD 5,000 per year and receiving ten uses per year. This journal will have a USD500 cost per use, while getting the ten articles through ILL or DD would cost USD300 per year. This would save USD4,700 per year, making switching from a subscription to a PPV model cost-effective.

Jarvis & Gregory (2016) agree with Murphy & Buckley's (2018) illustration and present evidence from the University of Utah Spencer S. Eccles Health Sciences Library. In 2012, Eccles Health Sciences Library selected 24 unsubscribed journals with a subscription value of USD71,500 for a one-year DD trial. At the end of the trial, Eccles Health Sciences Library paid USD3,103 for 107 articles from 23 publishers at an average cost of USD29 per article. This represented a saving of USD68,397. Jarvis & Gregory (2016) observe that DD was cheaper than ILL, estimated at an average cost of USD35 per article for the same set of requested resources. The delivery speed on Get It Now was 15 minutes compared to 1.97 days for ILL

(Jarvis & Gregory, 2016). Murphy & Buckley (2018) conclude that DD could be an effective collection development tool as access will be at a fraction of the cost of traditional subscriptions.

However, Jarvis & Gregory (2016) and Murphy & Buckley (2018) caution that librarians regularly check the cost-effectiveness of titles selected for this access model, as the costs are unpredictable and can vary from year to year. Changes in the curriculum and research focus can cause these variations in usage, and there is a need to switch the titles back to subscription as soon as the DD costs exceed the annual subscription cost.

3.3.13 Article-Level Access (ALA)/PPV access

Libraries employing a PPV approach acquire needed individual articles on request. This involves creating an account with a publisher and allowing users to initiate article purchases at the library's expense (Carr & Collins, 2009). With the CPP, libraries agree with publishers whereby users can access non-subscribed content on a PPV model.

Bergstrom (2010) suggests that universities should partially subsidize PPV access to articles in unsubscribed journals, and the researchers should pay a substantial share of the price for PPV articles. This will ensure that researchers economize on the use of articles. According to Bergstrom (2010), academics exaggerate their need for resources that someone else pays for. If they are obliged to pay for what they get, using their own or grant money, they would be more prudent in choosing articles.

However, Kolh (2006) disagrees and criticizes the transfer of library financial power from librarians to students and researchers who would start worrying about the cost implication of their teaching, learning and research behaviour. This could harm knowledge creation within the universities using the PPV acquisition model. Suppose the University of Texas at Austin and University of Notre Dame experiences are anything to go by. In that case, users reported not using the PPV as they thought the money display would be charged to them, not the library (Carr & Collins, 2009).

3.3.14 Free Copies

Bergstrom (2010) notes that free copies of most published articles are available in some disciplines on the author's websites. To illustrate this, Bergstrom & Lavaty (2010) used a

sample of 33 economics journals in 2006 and found that the median percentage of articles from the 16 most prestigious journals that were available free on the web was 90%. The median percentage for the 17 less prestigious journals was about 50%. Articles not available on the author's website can be requested from the author by an email and the authors will be delighted to find provide the article. (Bergstrom, 2010).

The advantage of DD, according to Murphy & Buckley (2018), is that it creates a versatile collection by allowing "libraries to adapt to constantly evolving patron information needs" (Jarvis & Gregory, 2016:99). Libraries can address new programmes and short-term research projects on time. Titles can be quickly deactivated at the end of the programme or research project. Publisher cancellation restrictions do not apply when deactivating journals at any time. DD can, thus, be seen as an optimisation strategy that could result in budget savings.

Chamberlain & MacAlpine (2008), Jarvis & Gregory (2016), Weicher & Zhang (2012) and Weir & Ireland (2011) report significant savings at Trinity University, which replaced their Elsevier subscriptions with a hybrid mediated PPV model. Lafayette College replaced publisher journal content with PPV, and St John's University replaced their Wiley subscription with the PPV model. On the other hand, Murray State University and the University of Nebraska experimented with PPV to supplement rather than replace their subscriptions.

However, the downside of these just-in-time models, as reported by Harwood & Prior (2008) and Jarvis & Gregory (2016), is that users sometimes purchase content that is already available in the library. Also, the usage statistics are unreliable, and concerns over archival rights and budgeting unpredictability exist. Concerning the lack of archival rights, Carr & Collins (2009) state that PPV may not be an acceptable acquisition form for research libraries committed to collecting and preserving literature for posterity. This study is on SARULs, so PPV might not be ideal. Researchers must access research content in perpetuity so as to build their research or dispute previous research.

According to Harwood & Prior (2008), UK universities that trialled the 'just in time' models experienced increased staff workload to administer the PPV programme. On the other hand, Carr & Collins (2009) found that US libraries did not report increased staff workload, as noted by the UK libraries. For US libraries, " monitoring the use of their PPV programme was no more burdensome than overseeing access to traditional subscriptions" (Jarvis & Gregory,

2016:94). The increased budget uncertainty reported in the UK was not an issue in the US. Carr & Collins (2009) provide reasons for the contrasting experiences in the two countries. UK libraries used the converting of subscriptions to PPV and the CPP, which, according to Carr & Collins (2009), are complex compared to the PPV model used in the US. Another reason was that US publishers had more experience using the PPV model, while UK publishers did not.

The drawbacks of 'just in time' models, as observed in the US, include the absence of continuous access to titles in the PPV model. Libraries implement cost-cutting measures that limit the use of library resources, potentially leading to unmet user needs due to concerns about incurring expenses for the institution. (Jarvis & Gregory, 2016). Kolh (2006:348) summarised this with an interesting observation about how the librarian's part in:

“Encouraging and expanding access to information was transformed instead into monitoring use and rationing access. It is librarians, finally and completely transformed into accountants rather than pursuing their traditional role as information providers (a truly alarming vision on multiple levels!).”

3.4 TOC

This study will use the TOC to identify if other constraints are causing the shrinking of library resources, besides austerity budgets. The TOC's continuous improvement branch has the TP tools, which provide a set of logical tools indicating 'what to change' through the CRT, 'how to change' through Evaporating Clouds (EC), and 'what to change to' through the FRT (Eidelwein et al., 2018). These tools help create a diagrammatic representation of reality, guiding the decision-making process and, thus, offering a systematic approach to handling challenging situations. TP, thus, provides a focused approach for eliminating observed UDEs one-by-one or identifying if there is a common cause or core problem causing all the UDEs. The shrinking of library resources is the study's UDE and has been problematic for years; hence, it will be helpful to use TOC to mitigate the effects of this problem and ultimately resolve it.

CRT identifies and describes cause-and-effect relationships that help determine the core problem (budget cuts) causing the UDEs (resource shrinking). According to Kim, Mabin & Davies (2008), once the core problem has been identified, it will be easy to develop solutions using the EC. The FRT will then identify and validate the solution and its impact on the

organisation's future. FRT is, thus, concerned about ascertaining whether the solution will create Desirable Effects (DEs), which will be the growth of library collections.

Eidelwein et al. (2018) and Simsit, Gunay & Vayvay (2014) report that the main idea of TOC is to identify a system's constraints (that is, the weakest links) and eliminate them to improve the performance of the whole system. Once one constraint is eliminated, another is identified, and the elimination process follows. Building on the chain analogy, Mishra & Palo (2014) state that a chain is only as strong as its weakest link. Thus, TOC views the weakest link as the constraints that hinder achieving the company's objectives. Librarians must identify constraints within their service provision and eliminate or mitigate them so as to be relevant to the institutions they support. It is, therefore, important to understand what a constraint is within the confines of any university library. This study will explore the issue of constraints.

According to Eden & Ronen (2007), Mishra & Palo (2014) and Naor, Bernardes & Coman (2013), a constraint can be physical, for example, resources or labour, and for this study, the shrinking budgets, market/external limit, dummy/a bottleneck that is very inexpensive compared to entire system and policy/rules or procedures, for example, government regulations that prevent the system from achieving its goals. Eden & Ronen (2007) give an example of a dummy bottleneck as the lack of sanitary resources causing delays in surgical procedures. In this study, this could be the lack of relevant technological support to allow access to library resources on or off university campuses.

Bendoly & Hur (2007), Cohen (2010) and Spector (2011) added situational, behavioural and the company's business model, while Mishra & Palo (2014) only observe two kinds of constraints, the structural and the procedural. Structural constraints involve beliefs, attitudes or designs of the system, while procedural constraints centre around the flow of goods and information. Pass & Ronen (2003) classify constraints into strategic and tactical, which Mishra & Palo (2014) dislike, as, according to them, the definition does not account for externalities in a system. According to Mishra & Palo (2014), while externalities would be dealt with at lower levels, they require strategic realignment. With these different categories in mind, it is reasonable to conclude that a constraint is anything that limits an organisation's ability to achieve its goal.

If one constraint is eliminated, TOC encourages that another constraint be identified and eliminated. This process needs to be repeated for an organisation's progress. With a constraint's ever-evolving environment, librarians must continually identify and mitigate old and new constraints in the university library scenario. Naor, Bernardes & Coman (2013) note that TOC aims to continuously improve the system by solving/breaking the constraints and answering the 'how' and 'why', using established TOC tools. This study is concerned with the continuous improvement branch of the TOC, which holds that organisations do not stop looking at, and solving, system constraints. Cohen (2010) Goldratt (2010) and Pretorius (2014) refer to it as a process of ongoing continuous improvement (POOGI), which is in the FFS.

Noreen, Smith & Mackey (1995) observe that the continuous improvement branch, which is the focus of this study, infers that a constraint in any organisation is apparent. Thus, work must be done to break or optimise it to achieve real progress. While harsh economic times bring budget cuts to libraries, they also increase patrons through library doors, as people cancel their home internet connections in favour of free access at the library and borrow library books instead of buying from the bookstores (Guarria & Wang, 2011). The optimal management of this constraint becomes mandatory, thus bringing the need for the TP and the FFS.

According to Simatupang, Wright & Sridharan (2004), TOC encourages managers to identify constraints and find ways to eliminate them using the TP roadmap. The TP roadmap consists of three generic questions that guide the process of constraints identification by looking at the current situation and trying to find the root problem, a strategy to solve the problem and finally, a detailed plan clarifying how the strategy is going to be implemented (Lin, Lee & Lee, 2009). Logic trees can help to expose the current problems of how to change the current problem and the envisaged future.

Noreen, Smith & Mackey (1995) used logic trees to structure a general management meeting to decide whether to lay off employees. According to Noreen, Smith & Mackey (1995:55), "the trees forced people to focus on understanding the problem and how their actions affect the entire organisation." One manager advised that there was nothing more convincing than trees written by the people who work in the company on the company's problems (Noreen, Smith & Mackey, 1995). Bauer et al. (2019) agrees, noting that the trees drawn by the people involved serve as a means of exchanging information and knowledge. These trees will, thus, be helpful in this study, as they will help illuminate needed optimisation strategies in libraries.

However, Noreen, Smit & Mackey (1995) point out that the trees were unsuccessful at other organisations, resulting in finger-pointing and too many variances as people's understanding of the trees differs. Unfortunately, there was no apparent reason why the trees worked in some organisations and failed in others. Some managers speculated that TP appealed to analytical more than intuitive thinkers and should not be adopted by companies, as this might drive away the less analytic thinkers. For this study, however, this will not be problematic, as the participants will provide the data for the trees as individuals and not as groups.

The FFS follows once the real constraints have been identified using the trees. According to Ikeziri et al. (2019), the FFS will help to manage the constraints systematically. Goldratt (1990) adds two steps to achieve continuous improvement: defining the systems goal and what performance measure to use, then following the FFS. Policy constraints need replacement with policies that support performance improvement.

3.5 Summary of the chapter

This chapter presented a literature review on whether austerity budgets were the only reason for the shrinking of library resources, optimisation strategies and TOC usefulness in optimisation strategies. Literature revealed that the shrinking of library resources was attributed to budget cuts by universities or governments, publisher, and researcher behaviours. Several optimisation strategies were unpacked. Insights from this review was used to compare with the current study's findings and to establish the study's contribution to the field. Through TOC this study provided a rational for shrinking library resources and optimisation strategies. The literature revealed a justification for the shrinking library resources and austerity budgets. It was noted that the libraries change of both library and budgeting theories to mitigate the problem were not effective. What could not be ascertained in the literature was the adoption of a management theory, such as TOC. This study adopted TOC in an attempt to resolve the challenges of the libraries. The next chapter presents the research methodology used to investigate the research problem.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.0 Introduction

The previous chapter reviewed the literature on austerity budgets, optimisation strategies and the usefulness of the TOC in optimisation strategies. This chapter covers the research approach, research design, the study's population, sampling rationale, data collection and analysis, validity and reliability issues, ethical considerations, and study limitations. This study methodology discussion helped in achieving the following objectives:

- a. To determine if austerity budgets are the only problems causing the shrinking of library resources.
- b. To establish what optimisation strategies were in place, if any.
- c. To investigate if the TOC could be successfully used to optimise SARULs budgets in an austerity environment.

4.1 Research

Booth et al. (2016), Kay (2022) and Song (2021) simplify the definition of research as a systematic investigation that has a reason and enthusiasm, aimed at contributing to the knowledge of a theory or topic and freeing the researcher and community from ignorance, prejudice and half-baked ideas by careful consideration, observation, or study of a subject. In addition, Booth et al. (2016), Fomunyan (2020), Gay & Airasian (1996), Kothari (2004) and Kumar (2014) observe that research is either applied or basic. Applied research focuses on discovering solutions to existing problems. The basic study aims at “finding information that has a broad base of applications and, thus, adds to the already existing organised body of scientific knowledge” (Kothari, 2004:3).

Furthermore, Fomunyan (2020) corroborates that basic research is driven by curiosity. This study is basic research due to its ontological consideration of finding out what is happening in the selected universities and how they mitigate their budgets in the austerity environment. The study gathered knowledge for knowledge's sake, generating new knowledge and not providing ways and solutions to these libraries (Hoskins, 2009).

Research is motivated by the desire to find answers to questions by applying scientific procedures (Kothari, 2004). The scientific techniques are referred to as methodology or prescribed framework. While Zamzam et al. (2022) report that methodology is the core of any scientific article, Kumar (2019) posits that methodology is critical as the validity or integrity of research findings depends on the soundness of the research methods and procedures adopted for the study. Loomba (2022:23) avers that, "a study's data are only as strong as the methodology by which they are derived".

Kumar (2019) and McCombes (2019) define research methodology as a strategy of conceptualising and analysing the social aspects of reality. The social reality of this study was that budgets were shrinking (Hoon, 2003; Crawford, 2015; SCONUL, 2016; CHELSA et al., 2014). The study used the appropriate methodology to investigate how the selected South African University libraries optimised their budgets. Beach & Kaas (2020) and Mavetera (2012) observe that the philosophical nature of a research problem dictates the research approach and methodology followed. This study sought to understand the effects of the budget cuts and to explore what libraries are doing to mitigate the problems and enable their library users to have continuous access to resources. TOC's five steps focusing processes for constraint management were applied to see its usefulness in libraries.

This study maximised knowledge acquisition using the following approaches: (a) case study design, (b) qualitative approach with an interpretive paradigm, (c) purposive sampling to select the population, (d) systematic literature reviews, interviews, and document analysis for data collection, and (e) thematic content analysis for data analysis. Participants were protected by adherence to ethical considerations. At the same time, the validity and reliability of the study were achieved by combining data collection methods, which minimised errors of exclusion that could occur when using one data collection method. Details of this study methodology are presented below.

4.2 Research paradigm

Jonker & Pennink (2010) describe a research paradigm as a collection of fundamental assumptions and beliefs that shape how one perceives the world. Thus, this section focuses on a thinking framework that guides the researcher's behaviour. In agreement, Rehman & Alharthi (2016) describe a paradigm as a belief system and theoretical framework with assumptions

about ontology, epistemology, methodology and methods. When simplified, it is a way of understanding and studying the world's reality. Babbie (2011), Feilzer (2010) and Neuman (2014) concur in their view of paradigm as organising structures, an integrated set of assumptions, essential models or frames of reference used to manage observations and reasoning in doing good research. Therefore, it is reasonable to conclude that a research paradigm guides a researcher in investigating research problems through scientifically proven procedures, thus strengthening the validity of the results.

The researcher examined the three main paradigms: positivist, interpretive and critical realist. Positivism is empirical and technical and aims at finding cause-and-effect relationships. Interpretivism is practical. It aims at an in-depth understanding of a problem, while critical inquiry is emancipatory and aimed at empowering people through knowledge (Du Plooy-Cilliers, Davis & Bezuidenhout, 2014; Hammersley, 2013; Pham, 2018).

Creswell (2009) and Riyami (2015) believe critical inquiry is a transformative paradigm which should change participants' lives. Pham (2018) disapproves, noting that it is difficult to observe changes in people's lives as outcomes of critical inquiry since actions may take time to reflect. Positivist/empirical researchers "want to ensure that the knowledge we gain via scientific means is based on facts alone, completely free from personal feelings or opinions" (Du Plooy-Cilliers, Davis & Bezuidenhout, 2014:22). However, Du Plooy-Cilliers, Davis & Bezuidenhout (2014) caution against this statement, arguing that objective knowledge is not possible as subjective factors such as the researcher's interest and expectations will influence the kind of questions asked and observations favoured over others. Pham (2018) concurs, noting that positivism is constrained in exploring abstract conceptualisation around humans as it neglects individuals whose understanding and interpretation of events can reveal the truth about reality. The other significant misfit of positivism for this study is the data collected, where participants may choose available answers rather than accurate responses, as questions are not flexible for participants to give answers relevant to their unique environment.

Considering the rationale above, the researcher opted for the interpretivism paradigm for this study, to explore and understand how SARULs optimise their budget in the austerity environment and if TOC could be helpful. Interpretivists acknowledge that people interpret their world differently and act based on such interpretations. According to Du Plooy-Cilliers,

Davis &Bezuidenhout (2014:27), the interpretivism tradition was developed to cover the weaknesses of positivism, and its strength is that:

“People are fundamentally different from objects. Consequently, we cannot study human beings the same way we study objects in the natural sciences because, unlike objects, human beings change all the time, and the environment they find themselves in continually influences them”.

In agreement, Creswell (2009), Hammersley (2013), and Pham (2018) add that interpretivism adapts a single phenomenon and multiple interpretation considerations, which enable a deeper understanding and diverse ways of seeing and experiencing the world through different contexts and cultures without bias. The study avoided cross-comparisons and, instead, concentrated on the “depth and detail that can be appreciated only through the exhaustive, systematic and reflective study of experiences as they are lived” (Thorne, 2000:69). The researcher acknowledged that these libraries saw the impact of austerity budgets differently. As such, the optimisation strategies were likely to differ. The study aimed at understanding austerity budget complexities and optimisation strategies within the unique context of SARULs, and not generalising results.

This study, therefore, sought a clear understanding of how the selected staff in the selected libraries saw and interpreted their austerity budget and what they put forward or thought would best help them manage their library collections in their libraries. The advantage of the interpretive paradigm is that it attempts to interpret and understand life, the world and the person from spoken words and written texts (Basias & Pollalis, 2018). With diversifying interpretations, interpretivism can describe the phenomenon well and deeply understand it in the social context (Pham, 2018).

One drawback of the interpretive paradigm is that its ontological assumption inclines towards subjectivity rather than objectivity (Mack, 2010). In support, Ataro (2020) concurs that the interpretive paradigm is subjective, personal, unique and flexible. The interpretive paradigm also leaves a gap in verifying the validity and usefulness of research outcomes using scientific procedures. Its sole objective is to attain a profound understanding of a phenomenon within its context without the intention of generalizing results to other contexts (Cohen, Manion & Morrison, 2011; Mack, 2010; Pham, 2018). To mitigate these disadvantages, the study took an objective stance when analysing collected data by placing assumptions aside and interrogating

and letting the data inform the research about what is happening in the environment. The researcher did not stick to preconceptions (Mack, 2010) but allowed the selected population's views to be objectively captured as expressed. The selection of the study's population is detailed below.

4.3 Research approach

Research approach has been defined by Mishra & Alok (2022) as the scientific and systematic process adopted to solve research problems. Creswell (2014), Du Plooy-Cilliers, Davis & Bezuidenhout (2014) and Kumar (2014) suggest that there are three types of research approaches, namely, qualitative, quantitative, and mixed methods. The selection of a research approach is based on the research objectives, topic, questions, and data collection and analysis process needed to increase the understanding of an issue (Basias & Pollalis, 2018).

4.3.1 Qualitative approach

According to Elliott et al. (2017), the qualitative approach focuses on how people sense their world and experience events. Open-ended or semi-structured questions from interviews and focus groups are used to gather data. Qualitative approach questions seek to answer the 'how' and 'why' questions. According to Beach & Kaas (2020:214), the qualitative approach is about "human meaning-making in specific contexts."

The qualitative approach was used for this study, although previous studies on library funding and resource cancellations used the quantitative approach (Blake & Meadows, 1984; Hoskins, 2009; Hoskins & Stilwell, 2010, 2011; Sweeney, 1999; Willemse, 2005). The qualitative approach permitted the researcher to conduct in-depth interviews and allowed for further probing of the respondents, which would not have been possible using a quantitative method. This approach, thus, provided more insight into the research problem. Myers (1997:243) earlier observed that "if there was one thing which distinguished humans from the natural world, it was the human being's ability to talk." This is corroborated by Beach & Kaas (2020), Flint (2022) and Head et al., (2021), who observe that the qualitative approach relies on verbal data provided by the participant only. The previous studies might have missed getting insight into the problem through narratives, which could have given strength or added more relevant data.

They chose not to adopt this, and this study has taken this as a shortcoming that needs to be addressed.

The quantitative approach, which would have predetermined answers, yes or no, would therefore not be sufficient. Thus, the researcher believed a qualitative approach would be ideal for adding more details and knowledge gaps in this area. Badenhorst (2007) had explained earlier that while quantitative research believes in a single reality everyone can see, qualitative researchers believe that multiple realities depend on meaning and interpretations. It is best to research what is out there in its context and complexity. It would, therefore, be appropriate to explore the multiple realities of the problem in this study that were missed by the quantitative belief of one truth. The universities under investigation are different; therefore, their realities are bound to differ. Kumar (2014:16) concurs that the qualitative approach is used if one wants to “find out the different perspective on an issue or the problems experienced by people living in a community.”

According to Strauss & Corbin (1990:11), early observation research that:

“Attempts to understand the meaning or nature of the experience of persons with problems...lends itself to getting out into the field and finding out what people are doing and thinking”.

In agreement, Prosek & Gibson (2021) and White (2021) add that honouring individual expression of their lived experiences as they answer the how, what and why questions for meaning in their context is vital to the qualitative approach. A qualitative approach was, thus, selected because this study sought to understand how the SARULs are optimising their budget in the prevailing austerity environment. The qualitative methodology would, therefore, be appropriate as it can be used to get intricate details about phenomena, such as feelings, thought processes and emotions that are difficult to extract or learn about through quantitative research methods.

Kumar (2014), Prosek & Gibson (2021) and White (2021) agree with Strauss & Corbin (1990) and add that the qualitative approach is suited for investigating the nuances and diversity within various aspects of social life. Since the researcher aimed at getting the views of the people in their variety, it was essential to understand the different views of the participants regarding how they mitigated their shrinking budgets. Du Plooy-Cilliers, Davis and Bezuidenhout (2014) refer to this as capturing individuals' experiences and experiential meanings. Creswell &

Creswell (2018) further emphasise that a qualitative methodology is an approach to exploring and understanding the meaning individuals ascribe to their social problems.

The advantages of the qualitative approach are that it is “interested in the depth of human experience, including all the personal and subjective peculiarities that are characteristic of individual experiences and meanings associated with a particular phenomenon” (Du Plooy-Cilliers, Davis and Bezuidenhout, 2014:174). Kumar (2014) agrees and adds that qualitative methodology aims at exploring diversity rather than quantify; it emphasises the description and narration of feelings, perceptions and experiences rather than their measurement, thereby placing no or less emphasis on generalisations. Basias & Pollalis (2018) simplify the advantage by noting that it supports in-depth research, thereby permitting the researcher to comprehend the nature and complexity of the phenomenon under consideration by examining the events in their natural environment from the people who experience them.

As Eisner (1991) records, the disadvantage of a qualitative approach is the researcher's possible subjectivity since the researcher's attitude, culture, and ethos might easily influence the qualitative approach inquiry. Kumar (2014:133) concurs, adding that it would, thus, be difficult to check for researcher bias “because of the flexibility and lack of control.” To avoid this problem, the researcher used Kumar's loosely developed list of issues as an interview guide. Once the research approach was identified, the relevant research design was selected and discussed.

4.3.2 Quantitative approach

Basias & Pollalis (2018) and Mishra & Alok (2022) describe the quantitative approach as systematically investigating phenomena through statistics and mathematics. The quantitative approach looks at objects that can be counted and, thus, concentrates on answering the ‘how many’ and ‘how much’ questions. Therefore, the quantitative approach is inflexible since data are gathered through questionnaires with specific, structured, closed questions (Creswell & Creswell, 2018; Neuman, 2014).

4.3.3 Mixed methodology approach

The mixed methodology combines the strengths of both qualitative and quantitative methods. Mixed methodology collects both quantitative and qualitative data. Creswell (2014) posits that

the mixed methods approach assumes that the combined approaches will provide a more comprehensive understanding of a research problem than either approach alone. Succinctly put by Beach & Kaas (2020), the mixed methodology enables robust inferences as different methods compensate for each other's weaknesses. However, this study used the qualitative methods due to the reasons explained in Section 4.2.1 above.

4.4 Research design

Kumar (2014:122) describes a research design as “the road map that you decide to follow during your research journey to find answers to your research questions as validly, objectively, accurately and economically as possible.” Napitupulu, Napitupulu & Kisno (2019:26) concur, adding that “a research design is a string of logic that ultimately links the data to be collected and the conclusions drawn to the initial questions of the study.” From these statements, it is appropriate to state that the research design selected enabled the collection of relevant data to answer the study's research question.

The study was a case study on six SARULs uniquely categorised as research universities by Carnegie in 2008, out of 25 government-funded universities in SA (University of Pretoria, 2008).

“A Case study is a research approach used to generate an in-depth, multi-faceted understanding of a complex issue in its real-life context. It is an established research design used extensively in various disciplines, particularly in the social sciences” (Crowe et al., 2011).

Prosek & Gibson (2021) postulate that a case study can be an individual, a group or a community. According to Kumar (2014:155), “to be called a Case study, it is important to treat the total study population as one entity ” Based on this argument, the six libraries in this study were treated as one entity, a case study. While quantitative research emphasises a greater sample size, the qualitative approach emphasises fewer cases (Kumar, 2014).

A case study is appropriate for exploring the research problem based on Kumar's (2014) argument that when an investigation is exploring and seeking an understanding rather than confirming and quantifying, a case study is of immense relevance. Basias & Pollalis (2018) observe that the need for rich empirical data indicates the appropriateness of a case study design since a case study permits examining the process in depth. Yin (2018) agrees and states that a

case study is used when one needs to understand a real-world case and assumes that such an understanding will likely involve critical contextual conditions about your case. This study aimed at achieving this, which is the main reason for selecting a case study design. Basias & Pollalis (2018:100) further opine that the advantage of a case study is that it facilitates multi-perspective analyses that lead to a holistic understanding of cultural systems of action, providing the insight that satisfies exploratory questions, which are the ‘what’ and ‘how’ research questions in this study.

Case study research can be much more detailed than possible if studying a large sample. In conclusion, however, there is a corresponding disadvantage; it is much “more difficult and often impossible to generalise the findings” (Kumar, 2014:155). This disadvantage is not significant in this study, as the study did not aim at generalising findings but sought knowledge. However, while the benefits were celebrated and the weaknesses mitigated, there was a need to select a relevant research paradigm to maximise the validity of the case study results.

4.5 Population

Population in research is defined as a distinct group, a unity of analysis of people, objects, events, and institutions that have some common characteristics on which the researcher focuses the scientific inquiry and draws some conclusions (Antwi & Hamza, 2015; Babbie & Mouton, 2001; Bhattacharjee, 2012; Du Plooy-Cilliers, Davis & Bezuidenhout, 2014; Walliman, 2011). The target population for this study were the DVC:R, LD/DD, MIR, ERL, RL, SCL, SL and their equivalent in the selected institutions.

Table 4.1: Number of selected respondents interviewed per institution
N=42

Name of institution	DVC:R	LD/DD	MIR	RL	SL	SCL	ERL	TOTAL
Rhodes university	1	1	1	1	1	1	1	7
Stellenbosch University	1	1	1	1	1	1	1	7
University of Cape Town	1	1	1	1	1	1	1	7
University of KwaZulu-Natal	1	1	1	1	1	1	1	7
University of Pretoria	1	1	1	1	1	1	1	7
University of the Witwatersrand	1	1	1	1	1	1	1	7
Total	6	6	6	6	6	6	6	42

This population was selected because the members were considered knowledgeable about library budgeting and information resources collection development and management. Library finance participants were excluded from the study as they lacked the required knowledge of the studied phenomenon. Finance participants would, therefore, not make meaningful contributions to the study. Taherdoost (2016) supports this, noting that researchers include participants they believe warrant inclusion.

4.6 Sampling methods

After identifying the target population, the researcher noted that it was impossible to investigate these participants in all the South African universities. For practical reasons, the studied universities had to be sampled. In agreement with Taherdoost's (2016) observation, sampling reduces the number of cases to be reviewed, as researchers neither have the time nor resources to study the entire population.

Sampling is “a trade-off between accuracy and resources” (Kumar, 2014:248). This study used purposive sampling, a nonprobability sampling technique. Ames, Glenton & Lewin (2019), Crossman (2020), Palinkas et al. (2015), and Patton (2007) define purposive sampling as an intentional selection of participants based on their knowledge and ability to elucidate a specific theme, concept, or phenomenon being studied. Non-probability sampling arbitrarily selects participants who can participate in a study. The selected participants would not fully represent

all people; hence, results would be biased, and no generalisations should be made (Ungvarsky, 2019).

Foley (2018) agrees and adds that purposive sampling is known as judgmental, selective, or subjective sampling, as it depends on the researcher's judgment when selecting participants. However, according to Miles & Huberman (1994) and Taherdoost (2016), nonprobability sampling is ideal for a small sample that investigates real-life situations using a case study design and qualitative research approach, which makes the selection of purposive sampling for this study appropriate.

Campbell et al. (2020) and Kelly (2010) recommend the utilization of purposive sampling to select respondents who can contribute distinct, relevant, and in-depth knowledge regarding the phenomenon being studied. The researcher, however, needs to have prior knowledge of the study subject and carefully consider and select the right participants (Foley, 2018). The researcher's judgment, thus, guided this study's sample selection regarding which university libraries were likely to provide complete and diverse information. The university libraries were RU, SU, UCT, UKZN, UP, and Wits.

Foley (2018) notes that using the researcher's judgement is problematic as it brings bias issues, which might be a challenge to prove that if a different sampling technique were used, the overall findings would still hold. Foley (2018), however, points out that researchers' bias was only a threat to credibility when the researcher's judgement was poorly considered or not based on clear criteria. In line with Taherdoost (2016), the selection criteria for this study was all the CCNY funding beneficiaries. CCNY introduced some information resources, projects and staff training programmes in these university libraries meant to model the transformation and enrichment of support to researchers (University of Cape Town, University of KwaZulu-Natal and University of the Witwatersrand, 2006). Carnegie made total payments for the first year and part payments for the second and third years, depending on the resource. The universities had to take over total costs after year three in the future. This resulted in these universities having common resources to support research unavailable in other South African university libraries.

There was also a training programme, which saw 36 librarians trained in two groups over three years. This resulted in 12 trained academic RL at the first three universities: the UCT, UKZN

and Wits. The training of staff was referred to as the Librarian's Academy, and it took place in SA, Mortenson Center at the University of Illinois, Urbana-Champaign and any major US research library (the University of Cape Town, University of KwaZulu-Natal & University of the Witwatersrand, 2006). The year 2009 saw the co-opting of three other universities, UP, RU and SU, in this research universities group. The researcher's thorough consideration of the selected purposeful sampled libraries mitigated the shortfalls associated with the researcher's bias as per Foley's (2018) advice.

4.7 Data collection

According to Strauss & Corbin (1990:8), early observation and data collection tools “furnish the means for bringing that vision into reality.” Previous studies on library funding studies by Blake & Meadows (1984), Hoskins (2009), Hoskins & Stilwell (2010), (2011), Sweeney (1999) and Willemse (2005) used questionnaires. Structured interviews were used as a supplementary tool by Hoskins (2009). This study used primary data from 42 semi-structured interviews with the DVC:R, LD/DD, MIR, ERL, SL or their equivalent in the selected universities. To increase credibility, relevant documents were analysed.

4.7.1 Interviews conducted for data collection

Scholars such as Archibald et al. (2019), Krouwel, Jolly & Greenfield (2019), Opdenakker (2006) and Saarijärvi & Bratt (2021) observe that new technology has paved the way for alternative qualitative interview data collection methods such as video, telephone, and online chat, for example, skype, zoom. In this study, interviews provided primary source data through WhatsApp, Skype and Microsoft (MS) Teams. Burns (1997:329) had earlier defined an interview as a “verbal interchange, often face to face, though the telephone may be used, in which an interviewer tries to elicit information, beliefs or opinions from another person.” According to Burns (1997), including the telephone implied using current technologies, Skype and WhatsApp. Burns' (1997) definition is still relevant, as concurred by Conway (2020), Du Plooy-Cilliers, Davis & Bezuidenhout (2014) and McGrath et al. (2019) that interviews assist the researcher in obtaining rich and in-depth factual data gathered from complex and multifaceted phenomena in a specific social context.

According to Archibald et al. (2019) and Saarijärvi & Bratt (2021), there is no difference between face-to-face and technology alternatives as both synchronised time and place. The

face-to-face alternative is time- and place-synchronised, while technology alternatives are also time and cyberspace, which is described as virtual rather than an actual place-synchronised. Technology alternative interviews were, thus, selected as suitable for this study because Wellington & Szczerbinski (2007) observe that they allow the researcher to investigate and prompt the participants' thoughts, values, prejudices, views, feelings, and perspectives. This was ideal for this study to answer the research questions in line with Conway's (2020) thinking that differentiated research interviews from other interviews, noting that data gathered from research interviews are used to examine the research question about the social world.

Interviews in this study allowed the researcher to explore in-depth austerity budget experiences and perceptions by the participants and the unique optimisation strategies employed in different universities. McGrath, Palmgren and Liljedahl (2019) summarise that interviews are valuable in understanding the subjective perspective of a phenomenon rather than generating generalisable understandings.

Two semi-structured interview guides were used. Appendix 2 (a) solicited information from library staff on austerity budgets from an operational point of view, while Appendix 2 (b) solicited information from the DVC:R from a strategic position. This helped give a complete picture of the research problem in the selected universities. All interviews were recorded with the respondents' consent to enable detailed transcription and analysis.

The advantage of a semi-structured interview was that it provided the researcher with varying questions, varying degrees of adaptation of questions, and question order to accommodate the participant. This approach helped, as observed by Rowley (2012:262) when he posited that:

“For a novice researcher, a semi-structured interview based on an interview schedule that centres on around six to twelve well-chosen and well-phrased questions to be delivered mainly in a set order, but with some flexibility in the question asked, the extent of probing, and question order, is a good starting point.”

One question could have two or four sub-questions or prompts, which the researcher used to ensure that the participants explored the main question sufficiently (Rowley, 2012). Basias & Pollalis (2018) agree, stating that an interview guide provides desired coverage of the areas of inquiry and comparability/consistency of information across participants.

Although Kumar (2014:177) argues that unstructured interviews provide “varied and in-depth information and are best suited to identify diversity and variety”, which was the study's primary

aim, Kumar quickly warns that it requires a high level of skills to conduct them. The researcher lacked this experience and, thus, selected a semi-structured interview guide. A list of themes/categories was kept and adhered to as a guide and reminder to the researcher's probing process that all areas of concern have been covered in all interviews. Kumar (2019) posits that using an interview guide ensures that the intended coverage of the areas under inquiry is achieved and facilitates comparability of information across different respondents.

The main disadvantage of interviews is that they are time-consuming and expensive, mainly if the respondents are not in one geographical area (Kumar, 2014). This study used Skype and WhatsApp interviews to mitigate this problem. Bertrand and Bourdeau concur by stating that Skype interviews, which they refer to as 'VoIP methods' have "the opportunity to considerably reduce the cost of research interviews and allow a greater number of researchers to collect their data easily, faster and at a lower cost" (Bertrand & Bourdeau 2010:1).

For this study, interviews were appropriate in clarifying questions when respondents were unsure of what was required. Neuman (2014:424) states that interviews:

"attempt to capture all the details of a social setting in an extremely detailed description and convey an intimate feeling for the setting and the inner lives of the people in it."

More relevant information will, thus, be solicited, unlike when a questionnaire is used, which is open to different respondent interpretations, which might affect the quality of the information provided (Kumar, 2014).

Two mobile instant messaging (MIM) applications, Skype and WhatsApp, were used to interview participants. Both applications were free to download and use, thus saving time, money and other logistical considerations involved in getting to these universities from where the researcher is based. Skype is software used on tablets, computers, and mobile phones for voice and video conversations with anyone worldwide.

According to Deakin & Wakefield (2014), Skype stands out among other online software applications due to its excellent national and international recognition and its option of video calling, which provides the researcher with the opportunity to not just talk to the participant but to see them in real time. ezTalks (2017) and Bouhnik & Deshen (2014), however, note that there was a time when Skype ruled, but things have changed, and WhatsApp is gaining popularity. Sullivan (2012) established that the advantage of Skype video interviews is that

access to verbal and nonverbal cues provides an equal authenticity level to face-to-face interviews. The researcher can observe and evaluate the nonverbal cues of the participant and alter or clarify questions according to what they are observing. According to Hanna (2012), Skype interviews, thus, mitigate the criticism of losing the visual and interpersonal interaction in non-video interviews.

Another advantage of Skype is that visual and audio interactions can be recorded, thus helping the researcher to recall, as it might be challenging to hear at the transcribing stage. Hanna (2012) concludes that both the researcher and the participants would remain in their comfortable locations of their homes or offices while being interviewed, thus removing a sense of the researcher encroaching on participants' personal space. According to Sullivan (2012), Skype interview increases participation as it occurs in more favourable conditions for the participant. Sullivan (2012) remarks that the benefits of using Skype and other communication programmes as a data collection method, especially in place of face-to-face interviews, outweigh the drawbacks. The researcher, therefore, encouraged participants to accept Skype interviews.

The disadvantages of Skype interviews might include that participants felt unsafe being video recorded, thereby removing the advantage of seeing the participant and interpreting or explaining non-verbal clues. Also, internet connectivity might present problems where the internet is not stable. The researcher stated that the video recording would be treated confidentially to mitigate these problems. The researcher followed Sullivan's (2012) thinking that fake Skype accounts with fake email addresses for the participants to use could be created if necessary for the participants to feel safe. Regarding internet connectivity problems, different time slots were available for the same interview. If the first slot for 9 am, for example, encountered problems, the second slot at 3 pm or 5 pm was used. If the first slot was successful, the other booked slots were cancelled. WhatsApp was used for participants who were not happy with Skype.

WhatsApp is a free-to-download smartphone application for instant messaging that operates on most devices and operating systems (Bouhnik & Deshen, 2014; ezTalks, 2017). The advantage of WhatsApp was that it was a low-cost application that could send an unlimited number of messages with immediacy and the capacity to conduct an ongoing conversation with many people simultaneously. However, this study's participants were contacted individually,

not as a group. Bouhnik & Deshen (2014) observe two primary downsides of WhatsApp: the inundation of irrelevant or nonsensical messages and the perception that the application lacks formality as a communication channel.

4.7.2 Document analysis

Additional primary data was found from analysing 30 annual library reports over five years (2014-2018). The five years were selected as the researcher viewed them as the crunch years in the history of SARULs budgeting. The year 2014 saw the introduction of VAT on electronic media in SA (CHELSA et al. 2014). The 2015 academic year was characterised by the #feesmustfall movement (Svicevic, 2015), and in 2016, the Rand reached an all-time high exchange rate against the dollar (Trading Economics, 2018). In 2017, the universities sought funding to cover the 0% student fee increase; in 2018, there was an additional 1% increase in VAT. Libraries were, thus, forced to cancel resources to ensure that expenditure did not exceed budget allocations.

Document analysis after interviews was a natural process followed to confirm, internalise and compare data, as corroborated by Flint (2022:521), who posits “listening as a process of attunement that provokes readings beyond what is immediately heard, seen, or felt.” The advantage of analysing these documents was that they provided the researcher with the correct language and words to describe the phenomenon and could be accessed conveniently (Creswell, 2014). The major disadvantage, however, was that some documents were not available for public access. To mitigate this, the researcher used these documents to supplement information from the in-depth interviews. An issue raised only in the reports and not confirmed from the interviews was not considered.

4.8 Data analysis

This study used the narrative analysis and discourse analysis strategies and ATLAS.ti.22 software to create network diagrams and data visualisation. According to De Fina (2021), Josselson & Hammack (2021) and Thorne (2000), focus is on individual voices in the narrative data to get the meaning of the actual life encounters. With the narrative themes detected from interviews, the researcher discovered how the selected participants understood and made sense of their library budgeting, collection development and management processes. McCarthy,

Christian & Slade (2019) further explain that discourse analysis evaluates language in its social context. It concentrates on the critical inquiry into the language used and how it is used to uncover the societal influences underlying our behaviours and thoughts.

In qualitative research, Thorne (2000:69) posits that data will be gathered as the researcher will be concerned about:

“Uncovering knowledge about how people think and feel about the circumstances in which they find themselves than they are in making judgements about whether those thoughts and feelings are valid.”

The researcher, therefore, envisaged that during the data analysis, an interpretive consideration was only conceivable by uncovering the meanings of a phenomenon (Thorne, 2000). This helped the researcher select information to focus on and disregard other information.

Bradley, Curry & Devers (2007), Creswell (2014) and McGrath, Palmgren & Liljedahl (2019) acknowledge that data analysis in qualitative research happens simultaneously with data collection. For this study, data analyses were not left until all the interviews were done or transcribed. According to McGrath, Palmgren & Liljedahl (2019), analysing while interviewing helps the researcher to become aware of emerging categories and themes. “While interviews are going on, for example, researchers may be analysing an interview collected earlier, writing memos that may ultimately be included as a narrative in the final report” (Creswell, 2014:195).

Thorne (2000:68) explains that in qualitative research, new analytic steps inform the data collection process, and new data inform the analytical process, hence, “data analysis processes are not entirely distinguishable from the actual data.” However, Bradley, Curry & Devers (2007) argue that the researcher must initially read the data without coding, to gain an overall understanding. This approach aids in recognising emergent themes without compromising the connections between concepts and their context. This study balanced the two schools of thought by not analysing data after each interview but after six interviews. This helped in not procrastinating data analysis for too long, which McGrath, Palmgren & Liljedahl (2019) reckon would give the researcher the impression of facing a monumental task. Data analysis was done while the interviews were still fresh in the researcher’s mind.

Babbie (2011) observes that data analysis in qualitative research is done by applying coding in the form of classification and categorising various data sets. If new codes emerge or codes that contradict previous understandings, Bradley, Curry & Devers (2007:1762) challenge researchers to “expand the sample to include participants and experiences to understand this new concept more fully.” The researcher was open to engaging with the new regulations emerging from the data.

The researcher used the inductive grounded theory approach in developing the codes. “This approach limits researchers from erroneously forcing a preconceived result” (Cruzes & Dyba, 2011:279). The researcher used constant comparison methods to check the correctness of the assigned codes by comparing text sections to sections previously given the same code, to see if they reflected the same concept. This process enabled existing codes to be refined and new codes to be identified, thus evolving the code structures inductively, reflecting ‘the ground’, that is, participants’ experiences (Bradley, Curry & Devers, 2007; Nelson, 2020). Coding stopped when no new concept emerged from reviewing successive data from participants.

According to Bradley, Curry & Devers (2007) and Creswell (1994), this process aims to consolidate data into a limited number of themes, typically five to seven, to extract the key insights and patterns. Themes are recurrent unifying concepts or statements about the subject of inquiry. “Themes are fundamental concepts that characterise specific experiences of individual respondents by the more general insights that are apparent from the whole of the data” (Bradley, Curry & Devers, 2007:1760). Raw data from WhatsApp and Skype interviews and document analysis were systematically coded into themes that answered the research question. According to Nelson (2020), coding such themes is not preliminary to any analysis but is part and parcel of interpretative practice.

This study used electronic ATLAS ti.22 software for inductive thematic content analysis (ITCAs). The above software was chosen because of its ability to analyse diverse types of qualitative data (Friese, 2019). To Creswell & Creswell (2018), ITCAs are beneficial for summarising a large data set’s main feature, helping the researcher produce a clear and more organised final report. The analysis involved multi-stages, which began with becoming familiar with the data, generating codes, creating themes, reviewing themes, creating networks and adding quotations, and finally producing ATLAS flow chart diagrams. During the coding process, the researcher immersed herself in the entire dataset and became familiar with it by

reviewing it. The researcher analysed each theme before creating an overall narrative from the transcribed data. The last stage involved a write-up of the report, whereby the researcher discussed each theme and presented substantial evidence using tables and figures.

4.9 Validity and reliability

Validity is about how well the research instrument measures what it is supposed to measure, while reliability is about consistency, dependability, and getting the same results if the study is repeated (Babbie, 2017; Bhattacharjee, 2012; Bosire, 2011; Creswell & Creswell, 2018; Fay, 2017). According to Golafshani's (2003:597) early observation, validity and reliability are standard in quantitative research as they are “rooted in positivist perspective” and need to be redefined when used in a qualitative study with a naturalistic approach. In agreement, Hayashi, Abib & Hoppen (2019) posit that qualitative studies have no universally- accepted way to assess validity.

For qualitative studies, Golafshani (2003) and Stenbacka (2001) recommend that validity and reliability be replaced with credibility, transferability and trustworthiness. In contrast, Ataro (2020) contends that validity in qualitative studies can be enhanced during data collection and analysis through pretesting questions and triangulation with data from different sources. Bracketing, where the researcher puts aside their preconceived knowledge, values, beliefs and experiences while collecting or analysing, strengthens the study's validity (Ataro, 2020). While validity and reliability in quantitative research focus on hard observable, measurable, replicability and repeatability of results and statistically relevant data, qualitative research is about understanding context-specific settings in the changing natural world.

This study sought to understand how participants make sense of their reality. Merriam & Tisdell (2015) observe that reality is holistic, ever-changing, and not a single or fixed phenomenon. This study's credibility, trustworthiness, validity, and reliability were achieved by triangulation of multiple data collection methods. Here, the researcher checked what was said in interviews, the results of the test interviews and the contents of the annual reports and other relevant documents of the participating libraries. Ataro (2020) and Merriam & Tisdell (2015:245) underscore that triangulation “is a powerful strategy for increasing the credibility or internal validity of your research.”

The researcher conducted test interviews at the UJ to increase validity and reliability and gain proper interviewing skills. UJ was not participating in this study but had a similar population to the participating libraries. The DVC:R, LD/DD, MIR, SL, SCL and the ERL were interviewed at UJ. This pre-test (pilot study) helped confirm that the interviewees understood and interpreted the research questions as expected by the researcher, identifying and clearing ambiguities, thus legitimising the questions and expected responses. McGrath, Palmgren and Liljedahl (2019) record that test interviews are essential as they allow the researcher to explore language, clarity of questions and aspects of active listening. The test interview, thus, helped the researcher guard against contaminating or biasing the data by driving the conversation to confirm the researcher's knowledge instead of letting the respondents present their views as they see fit.

To ensure the quality and trustworthiness of the data, respondent validation was done immediately after the interview by reading out the transcript to the respondents to confirm that the researcher understood and correctly interpreted them. Varpio et al. (2017) caution against respondents' validation, citing potential drawbacks of conflicting interpretation views. To mitigate this, the researcher corrected the transcript with the participant's interpretation. Results from the test and the actual study were compared, to confirm validity.

Thorne (2000), however, posits that validity and reliability were irrelevant in qualitative research, arguing that the proof of the quality rested entirely on the reader's acceptance or rejection of the claims. "If the findings 'rang true to the intended audience, then the qualitative study was considered successful" (Thorne, 2000:70). Golafshani disagrees, reporting that while validity and reliability are treated separately in quantitative research, qualitative research uses terminology that "encompasses both, such as credibility, transferability and trustworthiness" (Golafshani, 2003:600). Acknowledging the need to test and demonstrate that both quantitative and qualitative research are proper quality research that is credible, Golafshani (2003) clarifies the difference in the meaning of credibility in these research approaches, mentioning that in quantitative research, credibility depends on instrument construction, while in qualitative research, the researcher is the instrument; therefore, credibility will depend on the researcher's ability.

"A good quality research when reliability is a concept to evaluate quality in the quantitative study with a purpose of explaining while quality concept in the qualitative study has the purpose of generating understanding"(Golafshani, 2003:601).

4.10 Ethical considerations

This study adhered to the UKZN ethics policy, which underpinned all research to guiding principles of honesty and integrity, safe and responsible methods and fairness and equity for the participants (*UKZN research policy V: research ethics*, 2007). Ethical clearance was sought and granted by all the participating universities' research ethics committees. Participation in Skype and WhatsApp interviews was voluntary, and participant responses were confidential. Participants were advised that they were participating in a research study in line with Du Plooy-Cilliers, Davis & Bezuidenhout's (2014) advice, that participation was voluntary, and that they had a right to withdraw at any time.

Participants were asked to complete consent forms before participation, what Deakin and Wakefield (2014:8) refer to as “full informed consent, which was achieved through a short scripted passage to gain verbal consent.” Participants were made aware of audio or video recordings, if any. The data collected were categorised and anonymised for confidentiality purposes when reporting the results. Participants were never referred to as individuals, thereby maintaining anonymity.

4.11 Limitations

The data coding in this study was done by the researcher only, not by a team of researchers from diverse backgrounds. According to Bradley, Curry & Devers (2007), if a team did coding, it improved the breadth and depth of the analysis and findings. Bradley, Curry & Devers (2007) caution that one researcher's coding would not be the same if repeated by others with different traditions and paradigms. The researcher disclosed biases and philosophical approaches to the study to mitigate this shortfall. There is a possibility that some participants were excluded from Skype interviews “due to the need to have technological competence required to participate, obtain software and to maintain internet connection for the duration of the discussion” (Deakin & Wakefield, 2014:3). To mitigate this, the researcher did the schedule multiple interview times with the affected participants via Skype, WhatsApp or Zoom.

Another limitation of WhatsApp and Skype interviews was that participants might feel embarrassed or uncomfortable being filmed. To mitigate this, the researcher wrote and phoned, reassuring respondents that the recording would only be used for academic purposes. If

necessary, pseudo accounts were created for them, and no video recordings were done. Technical problems with sound quality, microphone and webcam malfunctions presented some limitations. Sullivan (2012) adds to the list of technical problems by stating that researchers might also forget to record. To mitigate this, the researcher kept a to-do list to remind what needed to happen with every interview. Test connections were arranged before the researcher finalised the interview date and time to ensure that the computers selected for the interviews worked to both the researcher's and the participant's satisfaction.

4.12 Summary of the chapter

In conclusion, this chapter provided an overview of the research methodology applied in this study. It included a comprehensive description of the research approach, research design, paradigm, the population of the study and sampling rationale, data collection and data analysis, validity and reliability issues, ethical considerations, and limitations of the study. The identified and described methodology was selected as appropriate for answering this study's research objectives and questions, clearly demonstrated in the narrative. The research design for this study was a case study that used an interpretive paradigm to collect qualitative data through interviews and document analysis. The population and sampling method were presented and justified. Data collection, validity and reliability, ethical concerns and the study's limitations were discussed.

As for validity and reliability issues, the chapter outlined how the interview questions were pre-tested at the UJ, which gave the researcher confidence in the questions and in doing the interviews later. Ethical issues were strictly adhered to and ethical clearance was sought. Interviews only commenced when the university issued the approval. Participants' confidentiality, anonymity and consent were requested in writing. The following chapter focuses on the analysis and presentation of the collected data.

CHAPTER FIVE

PRESENTATION OF RESULTS

5.0 Introduction

This chapter presents the research results in both narrative and visual formats. The presentation of results is based on specific objectives, which were to determine if austerity budgets were the only problem causing the shrinking of library resources, establish what optimisation strategies were in place, if any, and establish if the TOC can be used successfully in the optimisation of SARULs budgets in an austerity environment.

The study sought to answer the following research questions:-

1. What were the other reasons for shrinking library resources besides austerity budgets?
2. How were optimisation strategies implemented?
3. How helpful was TOC in the optimisation of SARULs budgets in an austerity environment?

The presentation is divided into three parts based on the above research questions. Depending on how the participant answered the questions, further probing was done to harness the results and solicit details. Tables and graphs were used for the thematic presentation of results. Each question asked was justified, and the results were presented.

The study used two qualitative semi-structured interview guides to solicit relevant information to answer the research questions. The first guide was for the librarians: LD/DD, MIR, ER, RL, SCL, and SL and their equivalent. The second guide was for the DVC:R. The questions were grouped per objective. Institutions were referred to as Case A to Case F, while respondents were referred to as respondents One to Seven per case where necessary, for anonymity and confidentiality reasons.

5.1 Response rate

Forty-two interviews were scheduled with RU, SU, UCT, UKZN, UP, and Wits respondents. Thirty-six interviews were for librarians and six for the DVC:R. One LD responded on behalf

of the DVC:R as requested, and participated in their LD's interview. Table 5.1 below shows the institutions referred to as Case A to Case F and the interview response rate.

Table 5.1: Cases and interview response rate

N=42

Cases	Respondents								
	DVC:R	LD/DD	MIR	RL	SL	SCL	ERL	Total	Response rate (%)
Case A	1	1	1	1	1	1	1	7	100%
Case B	1	1	1	1	1	1	1	7	100%
Case C	0	1	1	1	1	1	1	6	85.7%
Case D	1	1	1	1	1	1	1	7	100%
Case E	0	1	1	1	1	1	1	6	85.7%
Case F	0	1	1	1	1	1	1	6	85.7%
Total	3	6	6	6	6	6	6	39	92.9%

The responses indicate that Cases A, B, and D had a 100% response rate, while Cases C, E, and F had an 85.7% response rate. The total percentage per interview group was 50% for the DVC:R and 100% for Librarians, giving an average response rate of 92.9%, as demonstrated in Table 5.1 above. The low DVC:R's response rate was attributed to them being new in these positions. DVC:R for Case B had been in the job for two years, while the DVC:R for Case D had been in the job for three years, and the DVC:R for Case A had been in the position for 13 years at the time of the interview. DVC:R for Case F had been in the job for one month, and DVC:R for Cases C and E had been in their positions for three and five years, respectively. DVC:R for Cases C, E and F requested that the LD respond on their behalf, as they felt they would provide the needed details.

5.2 Biographical information

Of the 42 purposively sampled respondents, 39 participated during data collection. Table 5.2 below summarises the selected biographical information of the respondents who participated in the study. The respondents' profiles were described by gender, age range, library experience, education level, and position held in the university.

Table 5.2: Biographical information

N=39

Category	Specific attribute	Cases						Total	Percentage (%)
		Case A	Case B	Case C	Case D	Case E	Case F		
		(n=7)	(n=7)	(n = 6)	D (n=7)	(n = 6)	(n=6)		
Gender	Male	3	1	1	2	1	3	11	28.2
	Female	4	6	5	5	5	3	28	71.8
Age	>45	0	0	0	1	1	1	3	7.7
	46-55	5	6	5	5	3	2	26	66.7
	56-65	2	1	1	1	2	3	10	25.6
Library experience	>5	0	0	0	1	0	0	1	2.6
	5-10	1	0	0	0	0	1	2	5.1
	11-15	2	1	2	1	2	0	8	20.5
	>16	4	6	4	6	4	5	28	71.8
Educational level	Undergraduate	1	0	0	0	0	0	1	2.6
	Honours	2	2	2	2	2	3	13	33.3
	Masters	3	4	3	3	4	3	20	51.3
	PhD	1	1	1	2	0	0	5	12.8
Position held	Library staff	6	6	6	6	6	6	36	92.3
	DVC	1	1	0	1	0	0	3	7.7

The biographical information demonstrated the respondents' understanding of library budgetary issues and the factors affecting library resources. The biographic information showed that 28 respondents (71.8%) were females, and 11 respondents (28.2%) were males. The gender category showed that most of the respondents were females. The reason for the active participation of the female participants could be that most females occupy critical positions in the SARULs. Three (7.7%) of the respondents were below 45 years, 26 (66.7%) were between 46 and 55 years, and ten (25.6%) were between 56 and 65 years. Therefore, the age-groups 46-55 and 56-65 dominated the study. It is reasonable to think that this group brought an element of maturity in answering the interview questions.

Regarding library experience, one respondent (2.6%) had less than five years of experience, and two (5.1%) had five to ten years of experience. Eight (20.5%) had 11 to 15 years of experience, while 28 (71.8%) had more than 16 years of experience. With more than 16 years of experience in the library field, it is envisaged that the respondent's background helped provide the needed depth.

For the educational level, one respondent (2.6%) was a first-degree holder, 13 (33.3%) had Honors degrees, 20 (51.3%) had Master's, and five (12.8%) had PhDs. 38 (97.4%) had Honors, Masters, and PhDs, thereby potentially demonstrating a deep understanding of the Library and Information Science (LIS).

5.3 Reasons for the shrinking library resources

This section presents the results of the reasons for the shrinking resources other than austerity budgets. Using the TOC as the study lens, the results provided insights that could have been missed in past studies. Respondents who participated in the in-depth interviews were probed on whether the library resources were shrinking. The rationale of the question was to confirm if the study's observation was a true reflection of the experiences of the selected cases. Of the 36 librarians interviewed, 12 (33.3%), three respondents from Case A, two from Case B, four from Case F, one from Case D and two from Case E, acknowledged the link between the austerity budget and the shrinking library resources. The Case E: RL respondent reported that *"collections were not growing, they were shrinking, and we buy less physical and less electronic resources as they are expensive."*

Case A: SL respondent was specific, noting that:

"For us in humanities, which is essentially a print domain, it was a crisis when there was no money to buy print books as the entire library budget was spent on E-resources."

Another Case A: SCL respondent concurred, adding that print usage is shrinking as shown by circulation statistics showing that users now prefer electronic resources, which are expensive and unsustainable, resulting in library resources shrinking on all fronts, print and electronic.

Twenty-four respondents (66.7%) hesitated to acknowledge or completely disagree that library resources were shrinking. A Case B respondent noted that although austerity budgets affected library resources, *"there was a shift from growth in print purchase resources towards e-resource subscriptions and open access"*.

In agreement, DVC:R for Case D explained:

"I do not think resources are shrinking, but they are shifting away from buying print books to online resources. This is in line with the theory of change, which is a feature of modern society. The library sector, in particular, had to adapt because the entire"

enterprise was radically changed from hard books and journals to almost completely virtual and online".

However, when asked to comment on the growth of the purchased or subscribed resources, 27 (69.2%) respondents from the DVC:R and Librarians acknowledged that resources were shrinking. A Case B respondent noted, *"because of austerity budgets, the purchased and subscribed resources were shrinking, but the resources we access are growing due to OA alternatives available on the market"*.

A Case C: SL respondent summed this up by saying:

"A linear answer is yes, resources were shrinking as R10 in 2014 will not buy the same now as the buying power of the RAND has changed negatively. Therefore, fewer resources will be purchased".

Case A, MIR and LD respondents agreed and cited the continuous collection evaluation and management exercises within SARULs during an austerity environment. During collection evaluation, library collections were evaluated on current teaching, learning, research and community engagement functions of the university and non-aligned collections were cancelled. However, replacing the cancelled resources would not match the new resources in quantities. A Case F: LD respondent reckoned that *"although paid-for resources are shrinking, library resources are not shrinking as equally compelling OA resources are bridging the gap"*.

When specifically asked about the reasons for shrinking resources, respondents had varied responses, classified into economic factors, government policies, institutional culture, and scholarly communication transformation. Respondents from Cases A, E and F remarked that the causes of the shrinking budget are multi-faceted. Respondents from all cases agreed that foreign exchange rates significantly contributed to the shrinking library resources. Case D, DVC:R reported:

"Because of the exchange rate, worse than having enough money or not, even if we do budget properly, our budgets are compromised and risked as we cannot predict the exchange rate and many our purchases are in foreign currencies, from publishers that bill in dollars or Pounds."

Respondents from all cases of DVC:R and Librarians indicated that price increases in subscriptions negatively impacted library collections. Case B, C and D librarian respondents revealed that most publisher license clauses limit university libraries from sharing and

disseminating study materials. Case F, SCL respondents revealed that library resource growth was affected by government taxes levied on electronic resource purchases. In agreement, all the other case respondents from the DVC:R and Librarians concurred, acknowledging that VAT significantly contributed to shrinking library resources when prompted. A Case F: SL respondent lamented "*the government introduction of VAT on electronic resources, which eats into the low library budget*".

Librarian respondents from all cases also highlighted that institutional culture comprising codes such as rewards and personal behaviour contributed to shrinking library resources. However, the DVC:R for Case A disagreed with the Librarians' observation regarding the rewards system contributing to the shrinking of library resources. During data analysis, four themes were created from 12 codes. The four themes were considered significant contributors to the shrinking of library resources. The four themes are shown in Table 5.3 below:

Table 5.3: Major constraints for shrinking library resources according to respondents

N=39

Themes	Number of respondents	Percentage (%)
<i>Economic factors</i>	22	56.4
<i>Government policies</i>	8	20.5
<i>Scholarly communication transformation</i>	6	15.4
<i>Institutional culture</i>	3	7.7

Source: Field Data (2022)

When respondents were asked to select one major constraint among the four themes mentioned for the shrinking library resources (Table 5.3). By way of explanation, 22 respondents (56.4%) selected economic factors, eight (20.5%) selected government policies, six (15.4%) scholarly communication transformations and three (7.7%) respondents cited institutional culture as a contributing factor in the shrinking of library resources.

The incidence of the codes varied from case to case. The grouping of reasons into codes according to their overarching themes is shown in Table 5.4 below:

Table 5.4: Summary of the classification of codes on reasons for shrinking library resources and the frequency of codes per institution

N=39

Themes	Code	A	B	C	D	E	F	Number of respondents	Percentage
<i>Economic factors</i>	Foreign exchange rate	7	7	6	7	6	6	39	100
	Publisher models	7	7	6	7	6	6	39	100
	Economies of scale	1	-	-	-	1	1	3	7.7
<i>Government policies</i>	VAT on electronic resources	7	7	6	7	6	6	39	100
	Subsidy	5	4	4	5	5	4	27	69.2
<i>Institutional culture</i>	Reward System	5	5	5	3	3	5	26	66.7
	Personal attitude	5	3	2	1	2	4	17	43.6
	Security	1	3	2	2	2	3	13	33.3
<i>Scholarly communication transformation</i>	Information explosion	6	6	6	6	4	5	33	84.6
	Format shifting	6	6	6	6	6	6	36	92.3
	IR	7	6	6	6	6	6	37	94.9
	OA and OER	6	6	6	6	6	6	36	92.3

Source: Field Data (2022)

5.3.1 Economic factors

Expanding on the themes and codes in Table 5.4, all respondents (100%) cited economic factors, mainly the fluctuation of the foreign exchange rate, as the primary factor in shrinking academic library resources. Case F: LD respondent stated that the:

"Budget was increased annually in Rand terms, but the increases were not huge. Inflation meant that only current subscriptions could be renewed, and no new resources could be added. Faculties had to cancel other subscriptions to get new ones."

A Case E: ERL respondent concurred, adding, *"In Rand terms, the university increased our budget gradually, but unfortunately, the increase did not translate to an increase in buying power due to the exchange rate impact"*. There was a general agreement among the respondents that the library budget decreased in 2016 when the Rand was at its lowest against major currencies.

Case C respondents, on balance, agreed that a weakened Rand against significant currencies shrinks library budgets. One Case C: MIR respondent noted:

"I am old enough to remember when one British Pound was equivalent to five or seven Rands in the late 1990s, and now it is one British Pound to R22. Therefore, I would buy one book in 1996, and now I need four times the amount to buy the same book."

Twenty-four (61.5%) respondents from both Librarians and DVC:R acknowledged that the fluctuations in exchange rate erode their ability to acquire new resources, especially e-resources subscriptions. When asked, during in-depth interviews, whether the library budget adjusted relative to changes in annual exchange rates, A Case B: MIR respondent said: *"Foreign exchange rates are constantly fluctuating, and to be honest, it is not considered during budgeting."* Case D, E and F respondents disagreed, noting that foreign exchange is considered during budgeting. A Case F: LD respondent reported, *"Once or twice in the worst years, the university topped up the library budget to cover exchange rate fluctuation shortfalls."* A Case D: LD respondent commented on the disparity between favourable exchange rates and library acquisition, noting, *"If the foreign exchange rate is favourable, we would be able to pay for more resources."*

Regarding publisher models, respondents from all cases, both librarians and DVC:R, agreed that they contributed to the shrinking of resources. This was regarding their price increases, licensing, packages and embracing OA. A Case B: MIR respondent pointed out that, *"Publisher price increases were excessive and unsustainable not only in SA but worldwide."* Case A: LD respondent posited that:

"Some publishers increased prices by 8% or 10%, saying that is what they need to survive while they declare dividends and had profits, that is not ethical, and these publishers need to change."

A Case F: SL respondent concurred: *"Each and every publisher is always trying to protect and maximise their profits, thus disadvantaging libraries as users"*, while Case E: RL respondent mentioned that the reason why libraries have budgetary constraints is that publishers increase their subscription fees drastically for their benefit. According to Case D: ERL, SL and SCL respondents, publishers' high price increases result in constrained library budgets. Case D: ERL reported that the library could *"not purchase core databases and cancelled existing ones such as ClinicalKey, Doodies Essential books and Access medicine."*

On licensing, publishers are licensing limited access, especially on textbooks where the library requires multiuser or unlimited access. A Case D: LD respondent noted that publishers sell books in *"packages rather than individual titles, making it prohibitively expensive for libraries"*

to purchase needed titles." However, there was an interesting observation from a Case C: MIR respondent in support of publishers, stating:

"Libraries need to realise that operating costs from the publisher's side are also increasing. They have platforms where they host information for access, and vendors and agents need to be paid. The operating costs are on both sides, and you need to be considerate in your asking."

As for OA embracing, a Case C: RL respondent noted that *"it is not at all cynical as the publisher charges exorbitant APCs up to R50,000.00."* A Case C: RL respondent specifically noted the following:

"As a rated researcher, I only get R50,000.00 from the National Research Fund (NRF), which is equivalent to maybe one APC. So, chances of publishing in significant journals become much smaller because I cannot afford to pay the APCs."

Selective resource licensing was reported by all Cases, with a Case D: LD respondent commenting that, *"Some books were sold internationally, but not sold to our region –the SA market, thus making the title unavailable for library collection additions."*

The results of this study showed that inflation affected price changes for library resources. As alluded to, respondents noted further that some publishers have an across-the-board price increase while others monitor by usage to determine their pricing. Closely linked to pricing policy by publishers was the issue of big deals. Librarian respondents from Cases A, C, D and F commented on publishers' predatory pricing policy. A Case A: ERL respondent retorted, *"The pricing strategy favours those that buy bulk resources."* This pricing model by publishers effectively meant that libraries could not buy selected titles at a fair price. A Case C: MIR respondent noted that keeping up with ever-increasing prices is not easy. The Case C: MIR's response indicated that determining a strategy for negotiating big-deal pricing terms and conditions with publishers was challenging but crucial for university libraries.

On economies of scale, Cases C, E and F, librarian respondents cited economies of scale as a reason for shrinking library resources as they pay enormous amounts for SANLiC negotiated deals due to their vast student Full Time Equivalent (FTEs). However, in contradiction, a librarian respondent in Case A raised economies of scale as *"an advantage in that they pay less and access the same content as big institutions, thus allowing their library budgets to go far."*

It is important to note that a DVC:R in Case A disagreed, citing economies of scale as the reason for the shrinking of resources due to the reduced budget received.

5.3.2 Government policies

In all cases, there was a general agreement from both DVC:R and librarian respondents that government policies regarding VAT on electronic resources and subsidies allocated to the universities were significant factors in shrinking library resources (Table 5.4). A Case A: LD respondent reported, *"Exaggerated budget constraints due to VAT on e-resources"*, while a Case B: MIR respondent lamented, *"VAT increased the library budget expenditure by 15%, and the library had to cut the print book budget to accommodate VAT payments"*. According to a Case D: MIR respondent, VAT introduction meant millions of Rands had to be set aside for paying VAT. A Case F: SL respondent summed the VAT effect up, stating that VAT exaggerated the budget constraints, resulting in libraries not meeting the user needs, thus compromising the academic programmes.

All cases did not dispute that library resources shrunk due to the VAT on e-resources. However, a Case A DVC:R respondent posited that his library got the worst as it paid the same 15% as other cases even though their case got the least subsidy due to its few FTEs compared to other cases.

Regarding subsidy, all cases respondents had mixed reactions even within the same case. While there was a general agreement that the subsidy received from the government was insufficient, respondents' replies differed when asked if they would request the government for more money. In cases A, B, C, D and F, librarian respondents argued that librarians needed to make do with the received allocations and not ask for more. A Case B: SCL respondent noted, *"Even the wealthiest universities cannot have money to buy everything they need"*, while a Case F: RL respondent posited that *"the information explosion meant that there are many resources on the market and librarians need to move away from subscriptions to free alternative access models."*

5.3.3 Institutional culture

As illustrated in Table 5.4 under the institutional culture, Librarians and the DVC:R respondents from all the cases revealed reward systems, personal attitude/behaviour and security as legitimate reasons for the shrinking of library resources.

The respondents lamented that reward systems in all the selected cases emphasised publishing using high-rated, peer-reviewed journals, most of which were behind 'closed walls' rather than OAs. The DVC:R for Case B retorted, "*NRF is very focused on international recognition above local recognition. So local journals take a back seat.*" A Case A respondent reported that academics were, thus, "*leaning toward highly rated journals at the expense of those considered poor despite being accredited by the DHET.*" This situation created problems for cases as they continued to pay large sums of money, thus shrinking library resources due to austerity budgets. In contrast, a Case A DVC:R argued that academics need not be in a hurry to publish in OA journals. He recommended that the transition be an "*evolution, not revolution*". This misalignment of strategy in publishing in OA journals came through as a concern from most respondents.

The personal attitude of academics and students and the security of library resources were cited as a cause for shrinking library resources. Regarding the students' attitude/behaviour, a Case C: MIR respondent cited the burning of libraries, which was irresponsible, as the books could not be replaced due to budget shortages. A Case D: SCL respondent retorted that:

"During the 2016 #Feesmustfall protest, the law library was burnt, and the resources were irreplaceable because they were either unique or expensive to replace, thus contributing to the shrinking library resources."

A Case F: LD respondent concurred that: "*The burnt area during the student protest was the speech, language and disability sections which had rare and expensive collections which could not be replaced.*" Besides burning, a Case A: MIR respondent reported that the number of print books shrank due to student theft and students and academics borrowing and not returning books.

On academics' attitudes, a Case B: MIR respondent lamented that academics referred students to the textbooks they publish behind paywalls, forcing the library to spend money on expensive books, not OERs. A Case E RL and F: SL respondents gave an exciting observation that the shrinking of library resources was attributed to the "*many articles and chapters now available through ResearchGate so lecturers can get everything that they need, and they do not come to the library anymore.*"

5.3.4 Scholarly communication transformation

Regarding scholarly communication transformation, it was reported that a surge in demand for electronic resources has disproportionately affected library print materials (Table 5.4). Respondents from all Cases reported that libraries moved from printed to electronic resources and from a budget to purchase resources to licenses to view resources. Hence, a general cut in print resources was observed favouring electronic resources. A Case B: MIR respondent said this was a *"directive from the university that they concentrate on getting as much as possible eBooks"*. A Case D: LD respondent noted that the:

"Focus was on electronic books since 2015, and because electronic books are expensive, you will not get the same number in terms of growth as you would if you were buying print books."

The results demonstrated a distinct pattern of preferences that predominantly favour electronic resources. Respondents from all cases reported that libraries opted to sacrifice print resources budgets to support electronic resources. A Case A: ERL respondent noted that, *"About 90% of the library budget was spent on online content."* As reported by a Case F: RL respondent, this development further exacerbated the austerity budgets, as *"budgets were being channelled into training staff to understand the infrastructure in the electronic environment and the licensing models for the e-resources."* A Case D: MIR respondent, in agreement, stated that:

"Staff need to be trained in offering new alternative services, and managers need to be trained in managing the new services, library and vendors systems need to be changed to accommodate, store and provide the new services."

Regarding format shifting, a Case F: RL respondent explained that format shifting *"presented academic libraries with deliberate challenges in managing digital assets, thus failing to close the gap between the haves and have-nots regarding ICT infrastructure for the users to access resources on and off-campus"*. A Case C: RL respondent agreed and added that:

"Even pushing OA publishing more than subscriptions without budgetary support is a bad idea as it widens the gap between those who can afford APCs and those who do not have and cannot afford APCs."

All cases agreed that electronic resources were expensive compared to print, contributing to the shrinking library resources. A Case A: LD respondent raised a concern that this costly shift

does not guarantee that library resources will be preserved and available for future use. The respondent mentioned that, *"There was no guarantee that the OA website will be available in future"*. According to Case A, B, D and F library respondents, format shifting has, thus, contributed to the shrinking of library resources as the promotion of e-resources favours the interests of the publishers and owners of journal articles. A Case F: SCL respondent provided an example of digitising copy-protected or old articles to a different format by converting video home system tapes to compact disc or digital video disc, which would require an expensive license. To quote a Case F: ERL respondent, *"One publisher wanted to charge a ridiculous amount like 30,000 rands for us to digitise one old article that our School of Dentistry academic had written around 1969."*

In summary, a comprehensive presentation of the reasons for shrinking the budget is provided in a network diagram, the ATLAS.ti 22 flow chart diagrams Figure 5.1 below, showing the summary of verbatim quotes and the themes extracted from all respondents in the six cases:

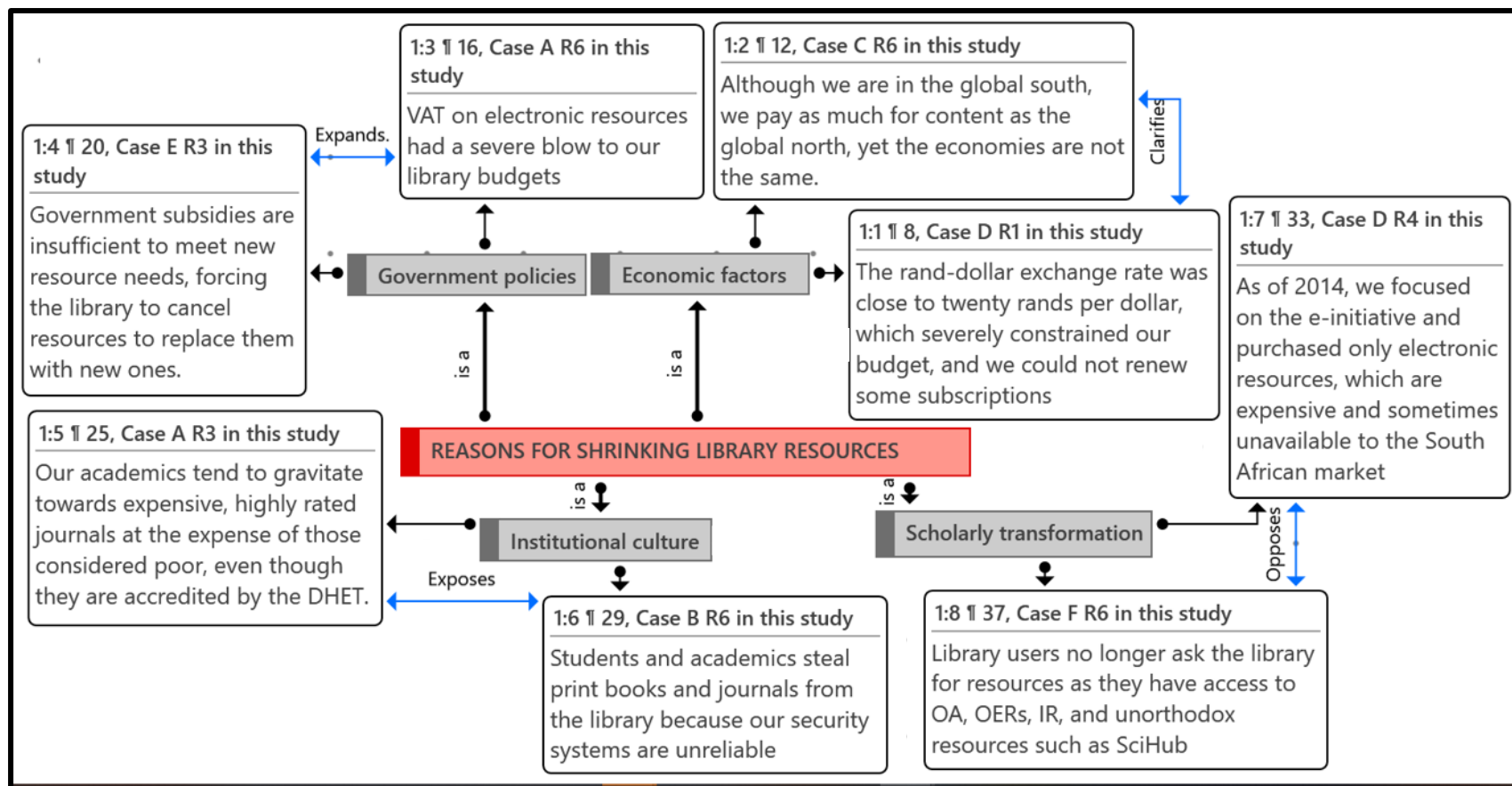


Figure 5.1: Reasons for shrinking library resources, themes and verbatim quotations

Source: Field Data (2022)

Figure 5.1 above is an Atlas flow chart diagram on the reasons for shrinking library resources and the verbatim quotations from respondents. The numbering of each quotation caption has been electronically generated and falls into three categories. The first digit, represented by a '1' before a colon, indicates the order in which the network diagram was generated electronically. In this specific case, '1' denotes that this flow chart diagram was the first to be generated during data analysis on reasons for shrinking library resources. The second digit represents the number assigned to a code. It is important to note that the numbers are generated chronologically. Thus, code numbers missing from the chart were eliminated during code refinement. Similarly, the third digit corresponds to the sequentially and electronically allocated quotation number. Case A to F represents the codes assigned to the case study universities, while R (1-39) corresponds to the code assigned to respondents.

5.4 Optimisation strategies implemented

This section presents the results of the optimisation strategies implemented by SARULs. As libraries have had to become more innovative in handling budgetary issues during austerity measures, SARULs combined practical and intuitive efforts with more strategic, customised ones — in-depth interviews brought the optimisation strategies implemented in all the cases to the fore.

A Case A: MIR respondent noted that the optimisation strategies were migratory. When specifically asked to list and explain the optimisation strategies and comment if they were sustainable and successfully done in their respective cases, respondents had common and unique strategies, which they all agreed were sustainable and successful. Although the strategies and approaches differed per institution, an agreed position was that implementing optimisation strategies was strategically aligned toward electronic resources.

Although Cases B, C, D and E librarian respondents highlighted existing optimising strategies, a Case A librarian respondent recounted that implementation of optimisation strategies "*were not defined, they learn as they go.*" In contrast, a Case F: SL respondent stated that "*much emphasis is also placed on short-term interventions rather than long-term.*" A Case A DVC:R respondent disagreed and discussed clear twofold optimisation strategies based on "*the institutional development and the institutional transformation plans.*" Case A DVC:R cautioned that:

"Short-term optimisation strategies should not be too reactive in order to develop collections with an archival valuable mind. Collections need to be aligned to the developmental and transformational objectives of the institution."

Optimisation strategies were categorised into six themes, namely, internal library processes and procedures, fiscal responsibility, internal academic mindset shift, university policies, publisher transformation strategies, and government policies. It is important to note that all six themes were common to all six cases. However, the cases had common as well as unique codes, which were specific to individual cases. The visual presentation of the optimisation strategy results is shown as an ATLAS.ti 22 electronically based thematic content analysis Figure 5.2 below, while Table 5.5 shows the themes and occurrence of each code in the form of densities and groundedness.

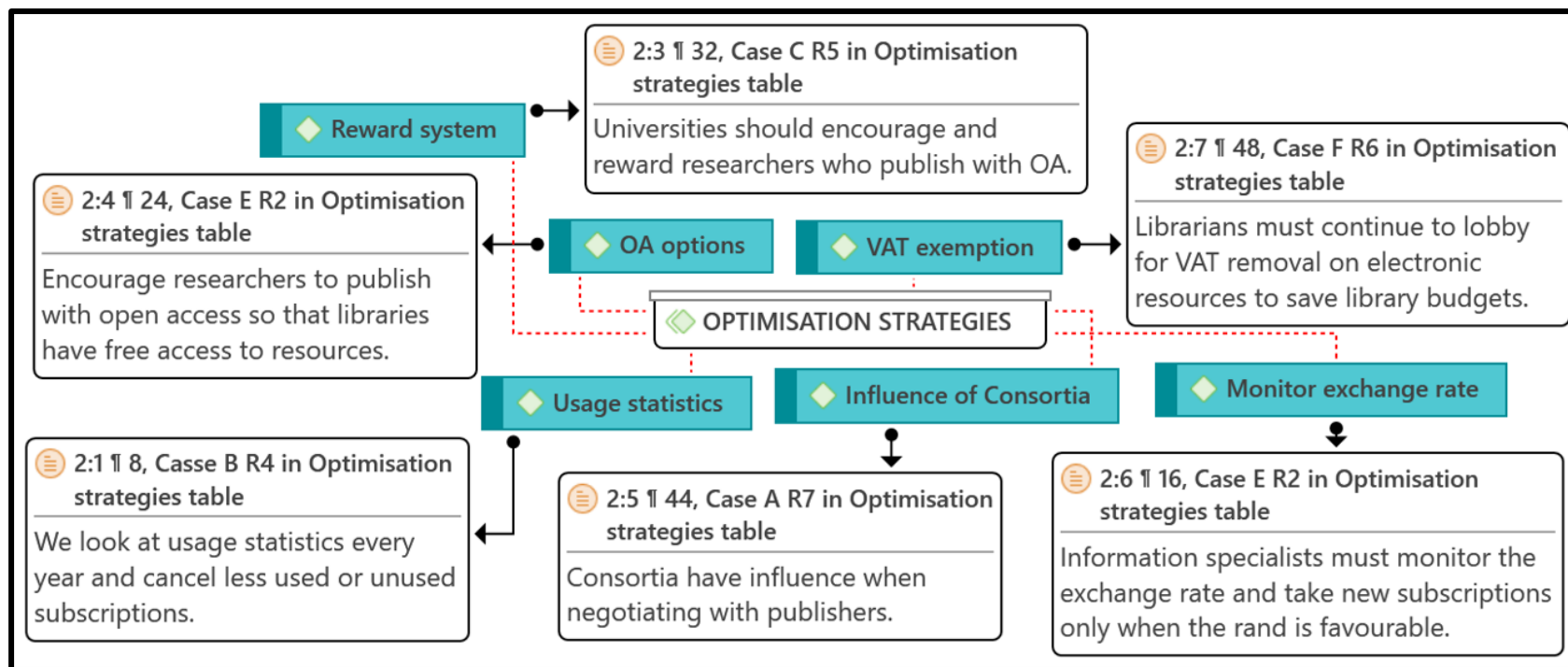


Figure 5.2: Optimisation strategies codes and verbatim quotations

Source: Field Data (2022)

Figure 5.2 above is an Atlas flow chart diagram on optimisation strategies. The numbering of each quotation caption has been electronically generated and falls into three categories. The first digit, represented by a '2' before a colon, indicates the order in which the network diagram was generated electronically. In this specific case, '2' denotes that this flow chart diagram was the second one created within this study to answer research Objective Two on optimisation strategies. The second digit represents the number assigned to a code, with missing numbers indicating that the code was merged with another during refinement. It is important to note that the numbers are generated sequentially. Similarly, the third digit corresponds to the sequentially and electronically allocated quotation number. However, some quotation numbers may be missing due to the screening process. Case A to F represents the codes assigned to the case study universities, while R corresponds to the code assigned to respondents.

Table 5.5 below illustrates the optimisation strategies, with their occurrences showing the densities and groundedness. In this study, densities show the number of themes in which a specific code was mentioned, while groundedness shows the number of cases in which the code was mentioned.

Table 5.5: Optimisation strategies themes, codes, and occurrences

N=6

Themes	Code	Occurrence	
		<i>Grounded</i>	<i>Density</i>
Internal library processes and procedures	Monitor usage statistics	6	4
	Avoiding overlaps	6	3
	Trials and stakeholder feedback	6	2
	Alternative access models	6	5
	Learn as we go	2	1
	Negotiate with publishers	6	4
	Staff development	6	5
Fiscal responsibility	Align budget with objectives	5	2
	Budget controls	4	2
	Economies of scale	2	2
	Monitor the exchange rate	6	2
Internal academic mindset shift	Use of the OA options	6	5
	Making use of internally published materials	4	3
	OERs	5	4
	Trial participation	6	1
University Policies	Incentives for research output	6	1
	Tenure and reward system policy	6	2
	unblocking unorthodox sites	2	2
Publisher transformation strategy	Libraries as publishing platforms	4	2
	OA	6	5
	TA	2	2
	IR	6	3
	Consortium and professional bodies	6	3
Government policies	VAT exemption	6	2
	Subsidising	6	2

Source: Field Data (2022)

Table 5.5 depicts how various codes were split into groundedness and densities and merged into themes. The coding process was closely followed by integrating 24 codes into six themes.

The merging of codes into themes is more than summarising data but addressing the research issues concerning optimisation strategies. The term ‘groundedness’ in coding refers to the number of cases/institutions that mention the code. For instance, a groundedness of six means respondents from all institutions mentioned this code.

On the other hand, ‘densities’ indicate how strongly a code is connected to other themes. For instance, if monitor usage statistics have a density of four, they could loosely belong to four different themes. A density of five indicates that a code is strongly connected to five different themes. Conversely, a density of one indicates the weakest connection. Table 5.6 below shows the six optimisation strategy themes ranking by the respondents per case.

Table 5.6: Optimisation themes ranked per case

N=6

Themes	Number of Cases	Percentage (%)
Internal library processes and procedures	6	100
Fiscal responsibility	4	66.7
Internal academic mindset shift	3	50
University Policies	*	*
Publisher transformation strategy	*	*
Government policies	*	*

Source: Field Data (2022)

Table 5.6 above records how the cases ranked the themes. All six (100%) cases mentioned all the internal library process and procedures codes in their responses, followed by fiscal responsibility with four (66.7%) as Cases A and D Librarians and DVC:R respondents did not mention libraries as publishing platforms as an optimisation strategy. Internal academic mindset shift had three (50%) Cases A and D Librarians and DVC:R respondents, did not mention using internally published materials, while a Case B: SL respondent did not mention OERs. The remaining three themes, university policies, publisher transformation strategy and government policies, although all cases mentioned them, were perceived to be less significant than the first three themes. The following sub-section presents the results per theme, illuminating the unique and contradicted codes in the narrative form.

5.4.1 Internal library processes and procedures

Table 5.5 shows that internal library processes and procedures were revisited as an optimisation strategy to get the best from the available budgets. It was interesting to note that in all the cases, Librarians and DVC:R respondents acknowledged that the bulk of the optimisation strategies resided in the libraries and were done by the librarians, an attribute of the TOC. For example, a Case F: LD respondent mentioned that:

"Librarians need to take the professional lead in this as they are the ones who can articulate it, do some research, advance it, do some quick and long-term wins, and use those academics who quickly buy into ideas as champions to promote the cause."

A Case D, DVC:R respondent retorted that:

"I am not a believer in the size of the budget determining whether the library provides efficient service, but of librarians changing the way they support the academy and looking for new ways of addressing the needs of researchers and students. Our librarians are doing this very well, finding alternative ways of getting resources cheaper, and orienting themselves to understand technology, software programmes doing training on endnotes, referencing, plagiarism."

In support of the Case D, DVC:R respondent, the Case D: LD respondent talked about their unique and cheaper way of accessing resources, the PPV. This is a service where the library buys articles requested by academics, PhD and Master's students that will not be available through ILL or other OA alternative services. A Case D: MIR respondent reported that, *"We have found that per year on PPV we will spend about R400,000.00 compared to subscribing to a database that will cost 12 million per year."*

However, Librarian respondents from Cases A, B, C, E, and F and some Librarian respondents from Case D felt that optimisation strategies must be a collective effort from librarians, academics, university management, government and library consortium, and allied bodies. A Case A: RL respondent said:

"Optimisation strategies are a collective engagement that needs to be led by librarians by rethinking their knowledge sharing and marketing, and then leaders and other stakeholders will be able to make informed decisions."

In agreement, a Case D: ERL respondent revealed that all new resource trials were considered mandatory before purchasing new resources. Librarians get feedback from users about the

resource's usefulness to current teaching, learning, and research needs. In this context, university libraries need to understand, analyse, and keep track of user behaviour to safeguard the university's financial resources from unnecessary spending.

5.4.2 Fiscal responsibility

There was a general view among the respondents that fiscal responsibility (Table 5.5) can be critical in library budget optimisation. According to a Case A: MIR respondent, *"austerity budgets were not a problem but common sense and should be dealt with instinctively as an adaptive method."* A Case E: ERL respondent concurred, noting that *"librarians are learning to be financially savvy and monitor exchange rate fluctuations so that they pay for foreign billed resources when the Rand is favourable."* A Case F: SL respondent cautioned that *"librarians need to follow all due diligence processes to avoid fraud."*

The economies of scale code had different interpretations. As alluded to earlier, Librarian respondents from Cases E and F viewed it as an optimisation strategy. In contrast, Librarian respondents from Cases B, C and D hesitated to acknowledge economies of scale as an optimising strategy. However, Case A librarian respondents contradicted on this. While a Case A DVC:R respondent advanced that economies of scale were not an optimisation strategy as the case *"receives less budget from the government and, therefore, has less to spend compared to other cases,"* within the same case, some librarians agreed with the DVC:R while one reported that, *"Economies of scale were optimisation strategies as they pay less on SANLiC negotiated deals due to their fewer FTEs and enjoy full access as those Cases who pay more."*

Regularising budget controls refers, for instance, to cancelling less utilised resources and big deals in favour of individual titles that are fairly on demand. As was already pointed out, regularising budget controls, backing IR, and pushing for VAT exemptions lead to feelings of having library collections that answer to current teaching, learning, research, and community engagement needs. However, cancelling resources must be carefully evaluated, as it could be meaningful to cancel big deals in favour of the identified less-used resources used for research purposes.

Case B Librarian respondents stressed the need for libraries to be creative and innovative when facing financial constraints. With Cases B, C, E and F Librarian respondents leaning towards

becoming entrepreneurship cases, attention was given to internally produced library resources for budget austerity measures to encourage students and staff to publish more internal resources. At the same time, Cases E and F invested in commercial photocopying services, research data management courses, and digitising training courses to generate more revenue, which was committed towards costs. However, a Case E: MIR respondent acknowledged that setting up a third income generation stream was complicated and required additional funding.

5.4.3 Internal academic mindset shift

This current study revealed that while experiencing austerity budget cuts, optimisation occurs within the university system through the institutional academic mindset shift, as reflected in Table 5.5. For those who plan and approve library budgets, using the OA options, internally published materials, OERs, and trial participation is the new coping strategy of this era.

The OA option is nothing new to libraries but has been made more relevant with the austerity budgets accompanied by demands for more and new resources without additional funds. A Case D, DVC:R respondent reported that:

"The crisis in academic publishing of the academics doing all the hard work and publishers charging them to access their work will be resolved because of the global open access drive, especially where public funding has been used to contribute to knowledge."

According to Case A and E: LD respondents, libraries buy back their academic research output from publishers at exorbitant prices. To mitigate this problem, a Case C: MIR respondent talked about

"getting teaching assistants to teach so that academics can have time to write textbooks. The academics keep saying they do not have time to write since they are employed to teach."

According to another Case C: RL respondent, if researchers publish their journals and books, it will help provide local content, thus helping with the decolonised curriculum drive. A Case E: SCL respondent talked about *"encouraging researchers to publish books and journals OA so that libraries have free access, compared to paying for access when they publish behind paywalls."*

Case E and F: SCL respondents noted that academics must seek library assistance before paying Dramatic, Artistic and Literary Rights Organisation (DALRO) funds to disseminate specific content on the learning management system as an optimisation strategy. Academics often do not realise that the library already has access, thus unnecessarily stressing the library budget.

5.4.4 University policies

As shown in Table 5.5, the university rewards system focused on allocating funding, acknowledging research, and driving quality research in all cases. A Case D, DVC:R respondent advanced the leveraging of subsidy by balancing rewards and impact, noting that academics should not exploit the system by focusing more on rewards than impact. A Case C: RL respondent indicated that as an optimisation strategy, *"universities should encourage and highly reward researchers who publish in OA journals and not subscription journals."* According to a Case E: SL respondent, universities, in their quest for ranking in SA, brief academics on appointments to publish in high-impact journals, which affects library budgets. A Case E: MIR respondent noted that there was a need for universities to include OA journals in their briefing.

5.4.5 Publisher transformation strategy

Respondents from all cases agreed that publishers (Table 5.5) are problematic and negatively affect library budgets. According to Case A, E and F respondents, the current TA are not helpful as they are capped. For some agreements, the cap is applied to all SA universities, while for others, the cap is per university. There is a need to find ways to disrupt the publishers, as such negotiations have often failed. A Case SL respondent cited the development of libraries as publishing platforms as an optimisation strategy, stating, *"If all institutions get together and everybody publishes a little, we can change the status quo."* Case B and F Librarian respondents concurred, recording how their cases published their academic research content. Cases B, C, D and F Librarian respondents highlighted how well used their IRs were by their students, academics and worldwide users, as seen in the usage statistics analysis.

A Case E: MIR respondent elaborated, saying:

"We encourage academics to consider prescribing OA and OERs than to continue prescribing a particular textbook that was prescribed for the last 20 years, and every second year there is a new edition, which gives publishers and bookshops power."

A Case E: SCL respondent recorded encouraging researchers *"not to give away their copyright to the publisher."* This helps because the publishers will not require a copyright clearance fee when the research needs to embed a permanent link or PDF of their content on the learning management system.

After exhausting internal library processes and procedures in response to the austerity problem, SARULs looked for consortiums and other professional bodies for sustainability. Consortiums and other professional bodies help negotiate prices with publishers on behalf of academic libraries to improve their purchasing power. A Case A, DVC:R respondent pointed out that *"consortiums and professional bodies create an excellent critical mass or an economy of scale in price through service negotiations with publishers."*

5.4.6 Government policies

There seems to be an implicit recognition that government taxes and VAT affect library resources, as shown in Table 5.5. For example, all the cases thought there were more benefits to using OA sources and monitoring exchange rate controls. The respondents from all cases noted that continued negotiations with the government for VAT exemption were necessary as an optimisation strategy.

Librarian respondents from all cases agreed that government policies through the DHET granting accreditation and subsidies to researchers who publish in accredited publications prolong the OA acceptance problem in universities. However, a Case A DVC:R respondent thought the DHET subsidy criterion was well thought out and OA acceptance was on track, as previously alluded to. However, a Case C: RL respondent suggested that the government changes the research subsidy since:

"For every article published, the author gets 30K, and the institution gets about 110 000K if you publish OA, you get the full 110 000K, and if you publish in a proprietary journal, you only get 60% of that. This will change the mindset of researchers."

However, it must be noted that higher education institutions do not necessarily award their authors the same from the government subsidy as suggested by the Case C: RL respondent.

Respondents from all cases stated that they needed the government to reduce the financial burden and assist academic libraries in sourcing library resources. For example, in Cases C, D and F, Librarian respondents noted that the government could allocate more budgets to universities through subsidies. Notwithstanding the above, all the cases cited the government making national deals as an optimisation strategy. A DVC:R for Case D reported:

"For example, instead of each of the 26 state universities having a contract with ScienceDirect and paying 26 times, it might be better for DHET to take a national deal and negotiate with publishers at a national level."

5.5 Summary of the chapter

In this chapter, the study results were presented. The biographical data revealed that the institutions studied were female-dominated, with 71.8% of respondents being female. The chapter proceeded to provide major results on the reasons for the shrinking of library resources. Economic factors, foreign exchange rates, publisher models, and government policies were identified as key contributors to this issue. Furthermore, the chapter explored potential strategies for optimizing library resources during austerity times. Internal library processes and procedures, such as monitoring usage statistics and avoiding overlapping content, were suggested to achieve this. Other strategies proposed included fiscal responsibility, influencing internal academics' mindset regarding OA and OER adoption, lobbying for economically viable university and government policies, and adopting publisher transformative strategies.

The austerity budgets have exposed financial disparities between the rich and poor cases, putting a strain on small universities within SARULs. Although results showed that library resources are not shrinking but changing form, SARULs reported no growth in purchased and subscribed resources due to the austerity budget. Adopting the current optimisation strategies by cases was a welcome development. All cases highlighted optimisation strategies mainly in the form of alternative access. Disruption of the publishing industry also came out strongly. Respondents reported that publishers were not helping the situation and that something had to be done to save libraries. Genuine unlimited TA needs to be negotiated with the publisher and the current capped ones done away with for libraries to achieve economic gains. Although universities have been able to cope with the current strategies, without sustainable optimising strategies, they will likely struggle in the end, as electronic resources are expensive. It could be reasonably concluded that the findings of this study aligned with the TOC, illustrating the

complex and interdependent nature of the reasons behind shrinking library resources. It emphasizes the need for multi-faceted solutions and a holistic approach to continuous resource optimization. Overall, this chapter critically examined the current state of library resources and offers valuable insights into potential strategies for improvement. It highlighted the challenges libraries face due to various external factors and emphasized the importance of proactive measures to sustain and optimize library resources.

CHAPTER SIX

INTERPRETATION OF RESULTS

6.0 Introduction

This chapter interprets the research results by assigning meaning to the study findings and placing them within the context of the existing body of knowledge. The significant findings of this study are discussed and interpreted. As highlighted in Chapter One, the present study sought to investigate the optimisation of SA university library budgets in an austerity environment to mitigate the shrinking of library resources. Thus, this chapter begins by illuminating the reasons for shrinking library resources across the SARULs. The chapter ends with the current strategies implemented by SARULs to optimise their budgets.

6.1 Background information of the respondents

As reported in the previous chapter, 39 respondents from six institutions were interviewed during data collection. The biographical information was collected and analysed to assess if respondents had sufficient knowledge to respond to the research questions. The data showed that 36 (92.3%) respondents were between the 46 to 65-year age-group, which brought vast experience and knowledge in answering the interview questions. Regarding library experience, the population presented in Chapter Five (Table 5.2) stands reputed for having a high number of respondents with sufficient knowledge about library administration, as 38 respondents (97.4%) had five to more than 16 years of experience. Regarding educational level, 38 (97.4%) respondents had Honours, Master's, and Doctorate degrees. The library experience and academic level show that respondents had sound, in-depth knowledge and understanding of the LIS field.

The biographical information suggests that the respondents were qualified to provide the needed data for the study. Creswell & Poth (2016) state that selecting appropriate respondents qualified to provide credible data for the study is essential in qualitative research. Hence, respondents were deemed likely to possess abundant data or insights compared to others, making them more relevant and valuable in accomplishing the research purpose and addressing the research questions (Johnson, Adkins & Chauvin, 2020). The interpretation of the results follows the order of the research questions in the descriptions below.

6.2 Reasons for the shrinking library resources

This section interprets the results on the reasons for the shrinking resources other than austerity budgets. Using the TOC as the study lens, the results provided reasons for shrinking library resources that could have been missed in past studies. Respondents who participated in the in-depth interviews were probed on whether the library resources were shrinking. The rationale for the question was to confirm if the study's observation was a true reflection of the experiences of the selected institutions.

The results show that all 39 (100%) respondents agree that library resources are shrinking. However, 27 (69.2%) respondents clarified that only purchased and subscribed library resources were shrinking and not the resources accessed by library users due to the shift from print to online information explosions in the OA resources. The reasons for the shrinkage of library resources were classified into four themes, namely, economic factors, government policies, institutional culture, and scholarly communication transformation. These four themes are discussed below.

6.2.1 Economic factors

The results of this study support the notion that economic factors, which are foreign exchange rate, publisher models, and economies of scale have contributed significantly to shrinking library resources. The factors were discussed below in light of the data collected during this study.

6.2.1.1 Foreign exchange rate

Respondents were asked to comment on the impact of the exchange rate on library resources. All institutions' respondents reported that exchange rate fluctuations affect their ability to acquire new resources and formats, especially subscriptions to electronic resources. However, respondents from two institutions indicated that foreign exchange rate fluctuations are rarely considered during budgeting, even though the exchange rate is as important a factor as inflation. Respondents from the other four institutions reported that exchange rate fluctuations are considered in their annual budgets. A closer analysis of the results shows that there needs

to be more consistency in factoring in the exchange rate in budgeting in the selected institutions. One explanation for this was that the budget of the SARULs was influenced differently from the beginning, in the budgeting phase, and each institution had its unique position. Furthermore, this current study established that libraries face financial constraints in a complex manner. Given the currency fluctuations' complexity, the SA Rand's weakening is often harder to spot, making it challenging to factor in library resources budgets.

Respondents pointed out that the impact of exchange rates on library budgets is significant, and SARULs need to find strategies to mitigate this. Tise & Truran's (2019) findings confirm the impact of the exchange rate on subscription fees and the consequences of a weakening Rand. For example, the same study claims an average percentage increase of 73% in foreign currency between 2011 and 2019, translated to 179% in the SA Rand (Tise & Truran, 2019). The results of this study clearly showed that a moderate percentage increase of 179% was severe and unsustainable. The above is, however, not peculiar to SA, as in other countries like Canada, Moscovitch (2016) reported that libraries had less money to pay for resources billed in USD due to the weakening of the Canadian dollar. In this study, all respondents lamented that the impact of exchange rates on library budgets was real and severe. The minor institutions in the SARULs specifically fretted that the large fluctuations in exchange rates exaggerated their small budget's impact.

6.2.1.2 Publisher models

Publisher's price increases, licensing, packages, and attitudes towards OA have significantly impacted the shrinkage of library resources, as the ATLAS. ti 22 flowchart, Figure 5.1 in Chapter Five, shows. Although Pylarinou (2014) notes that libraries have been well-funded in the past, respondents in this study acknowledged that the situation had changed. Such a change in the environment may have gradually made university libraries more sensitive to price changes. Libraries are, thus, becoming more responsive to factors such as publisher prices and licenses (Casselden et al., 2019). Consequently, this study argues that publishers' pricing models have the potential to impact library resources as universities seek to hedge against external financial threats.

It is important to note that the results of this study showed contradictions in the responses to publishers within the institutions. While other respondents wanted to avoid resources from

publishers with high and irrational prices, others supported them by urging libraries to subscribe and academics to publish in their journals. Because of this complexity, respondents indicated that some librarians and academics were biased towards the very expensive publishers. This finding is consistent with a recent Dhanabalan et al. (2018) study, which argues that higher prices could increase customer satisfaction. However, a closer analysis of the above results shows that this approach may not be helpful for library budgets, especially when other legitimate ways to access the content are inexpensive. The motivation for this current study was the bargaining difficulties university libraries face in the context of austerity budgets and the conflicting positions of academics and other librarians on purchasing and subscribing to expensive publishers. Therefore, libraries must focus on evaluating the quality offered by publishers regardless of the price scale and seek alternative legitimate access points for their users. All the respondents pointed out that the timing and manner in which publishers change prices for electronic and print resources has become crucial in libraries' decision to order library resources.

Respondents described publishers' subscription rates, OA fees, the APCs as predatory, unsustainable, unaffordable, and widening the gap between the rich and poor. This sentiment is shared by Campbell et al. (2022:5), who note that subscriptions "perpetuate barriers for readers whose institutions cannot afford subscription fees and barriers for authors without institutional support to publish their articles open." One respondent in this study lamented the models of publishers in terms of their attitude towards OA as a kind of explanation. APCs of up to R50,000.00 were mentioned. In SA, this study verified that R50,000.00 is the NRF budget for an evaluated A-rated researcher. This covers one APC per year. If a researcher is not rated, this fee excludes them from OA publishing. Butler et al. (2022) concur that the prices were exorbitantly high when the commercial publishers known as oligopoly publishers, Elsevier, Sage, Springer-Nature, Taylor and Francis, and Wiley, changed their business model from charging subscriptions for reading to charging authors fees for publishing. So, the subscription and OA publishing publisher models must be revised to save library budgets, particularly those of the five oligopoly publishers. Green (2019) summarises the publisher's shift from subscription fees to APCs as flipping the paywall into a play wall with no benefit to library budgets and authors, without financial support.

To expound on this, publishers are only concerned with their profit margins, which leads to high financial demands that libraries can no longer afford. According to Campbell et al. (2022),

APCs have become a second source of revenue for publishers alongside subscription fees paid by libraries. Butler et al. (2022) show that authors paid USD1.06 billion in APCs worldwide between 2015 and 2018. This situation is exacerbating and affecting the ability of university libraries to use their budgets for resource collection and development.

6.2.1.3 Economies of scale

It is important to note that there were contradictions between librarians and DVC:Rs within some institutions. While some librarians saw economies of scale as good, as their institutions paid less for the resources negotiated by SANLiC, some DVC:Rs held a different view. These DVC:Rs argued that their institutions received less subsidy from the government and were, thus, constrained in their ability to expand their library resources. From an operational point of view, such contradiction was expected between the librarians and the DVC:R, but what was interesting was the contradiction among the librarians themselves. This could mean that some librarians think strategically while others are purely operational. It could also mean that some librarians are contented with paying less for SANLiC-negotiated deals while ignoring their institutions' lack of non-SANLiC deals due to budget constraints. Analysis of the annual reports for the institutions showed that the latter was true. The contradicted institutions in this study had the least resources regarding the total number of subscriptions compared to the other institutions.

Although the contradiction from the other institutions was acceptable, most respondents agreed that economies of scale were awful because libraries paid more on the SANLiC negotiated deals. Respondents from large institutions said they spent more on SANLiC deals, thus carrying other institutions. It can be concluded that the results show that economies of scale can be perceived to hurt the library budget and contribute to the shrinking of library resources.

6.2.2 Government policies

This study illuminated the impact of government policies regarding VAT on electronic resources and the subsidy on library resources.

6.2.2.1 VAT on electronic resources

Another finding is that VAT on electronic resources has profoundly changed library resource planning, controlling, and collection development. Respondents from two institutions reported an excessive budget constraint due to the negative impact of VAT on resources, resulting in libraries failing to meet the user's needs, thus jeopardising academic programmes. This is particularly important because VAT changes affect library resource prices, as shown in studies by Blundell (2009), Dracke (2022) and Kopec (2020). The findings of this study are consistent with the study by CHELSA et al. (2014), which reports that university library budgets lost 40% of their purchasing power in 2014 when VAT was introduced for electronic resources in SA. Respondents to the current study summarised this by emphasising that the percentage change in VAT meant millions of Rands had to be set aside to pay for VAT. Previous studies also confirm this as Cerrillo & Rodriguez (2015) argues that VAT directly impacted the higher costs for electronic publications for Spanish universities, influencing libraries' decisions when purchasing resources.

In the in-depth interviews, respondents also expressed concern that the impact of libraries having to pay VAT on electronic resources was limiting their ability to maintain and acquire new resources. By way of explanation, the increase in VAT reduced university libraries' purchasing power and fewer new resources were added to library collections. The situation was worse for smaller universities, as they did not have the same financial resources as established universities. Obi & Okwu (2014) and Oishi, Kushlev & Schimmack (2018) conclude that collecting VAT payments was a significant challenge. Although the government generates revenue through taxes, Casselden et al. (2019) and Pylarinou (2014), in the literature on library budgets, called for governments to consider waiving the university VAT. In line with previous studies, scholars such as Pedersen (2018) and Piotrowska-Piatek & Kozlowski (2020) point out that VAT unfairly burdens lower-income universities. This is supported by scholars such as Dhanabalan et al. (2018) and Oishi, Kushlev & Schimmack (2018), who note that VAT is a flat tax, unlike income, where higher-income individuals pay higher taxes. These results show that all consumers pay the same percentage regardless of income.

Studies conducted in Kuwait also indicate that VAT hits those with low and limited incomes because it is a purchase tax that does not consider the average income of the consumer

(Almutairi & Naser, 2021). In Nigeria and Rwanda, Idowu & Obaretin (2022) and Mascagni et al. (2022) add that VAT is unfair, as all taxpayers pay the same tax rate regardless of income level, leaving the low-income earners to spend more of their income on fewer goods. An important question related to the impact of VAT on library resources is what can be done to deal with the VAT changes or to keep library resources on as VAT zero-rated resources. Higher education institutions need to respond to VAT changes. Therefore, it was necessary to advocate for tax subsidies and exemptions that could increase the capacity of university libraries to purchase more resources.

Another new finding of this present study was that there was no correlation between the introduction of VAT and the increased or decreased demand for electronic resources. It should be noted, however, that while the logic behind this study's findings was presented, studies still need to adequately construct a link relationship between VAT and the shift from traditional to digital libraries and derive a robust response. A close analysis of these results has shown that comparing the impact of VAT on print and e-resources inevitably leads to the assumption that there was a relationship between an increase in VAT and the type of library resources. The opposite is valid according to the results of this study, which show an increase in electronic resources and a decrease in demand for print resources.

Respondents called for tax concessions and exemptions, including increasing the university's capacity to buy more resources. However, it was also reported that efforts to abolish VAT on electronic resources failed because the government disregarded SANLiC and individual lobbyist efforts. It was, therefore, suggested that lobbying should continue.

6.2.2.2 Government subsidy

As far as government subsidies are concerned, the results indicate that university libraries need more support from the government. The decline in government subsidies, thus, impacted universities' ability to acquire library resources, resulting in considerable variation in the number of library resources and types across SA. Commenting on this phenomenon, Bangani (2018) cites the Universities South Africa (2016) report, which compared SA university funding from SA to 11 other countries. The report showed that SA was the lowest in expenditure as a percentage of Gross Domestic Product, which is consistent with the findings of this study. Griffiths (2019) confirms that government grants to universities in SA have

declined since 1994. In 1994, for example, 70% of expenditure was covered by the grant, but by 2013 it was only 30%. Although the decline in government grants over the years is not disputed in SA, the current study's findings contradicted the grant's adequacy to support libraries. While some respondents felt that the government subsidy was inadequate, others disagreed, stating that the subsidy is adequate, librarians needed to think in different terms.

6.2.3 Institutional culture

Institutional culture regarding how the reward systems were managed, personal attitudes of students and academics within the institutions and the security of library resources have a significant bearing on library resources.

6.2.3.1 Reward system

Respondents complained that institutional culture emphasises publishing in peer-reviewed journals, most of which are under 'closed walls' rather than OA journals. Based on the same reward system above, respondents indicated that the personal attitudes of students and staff towards highly rated journals are at the expense of those considered poor, even though the DHET accredits them. Studies on institutional culture and reward systems highlight the complexity and multifaceted nature of the system (Hedding, 2019). They lament that policymakers too often lose sight of the overarching need to contribute to knowledge generation rather than status, thus indirectly contributing to the limited access to library resources.

The current study's findings suggest that promotions such as author evaluation ratings and incentives tend to be publisher-biased; scholars' ratings and rewards are based on the number of publications in 'closed wall' journals. The environment of SA has been aptly described by Hedding (2019), noting that the reward system at SA universities is contingent on the quantity of published papers rather than the quality of scientific contributions. Consequently, this approach undermines the overall standard of scholarship in SA.

Other scholars, such as Casselden et al. (2019) and Horbach & Halfman (2018), warn about the lack of scholarship merit in doing this, as the prestigious closed journals were not wholly impervious to the publication of flawed studies. According to Hedding (2019), SA researchers

are forced to choose cash or quality as rewards for each paper published in an accredited journal. Respondents pointed out that another problem with the South African DHET is the inclusion of some predatory journals. Thus, it is a double tragedy: predatory journals erroneously getting on the accredited DHET list or flawed studies finding their way into pay-walled and accredited journals. The respondents also claimed that the number of low-quality studies is rising as more scholars focus on publishing several papers to gain recognition and rewards. This study's findings demonstrate that the current reward system only creates problems for institutions, which must pay large sums of money to access their resources as they will be in paywalled journals. Horbach & Halffman (2018) claim that some academics may be aware of these biases and exploit them to manipulate the system by promoting closed journals while disregarding OA journals.

The findings of this study showed that the reward system causes problems for institutions because it appears to be more focused on promoting closed-walled resources and the publication of numerous papers, with no emphasis on quality. The NRF was reported to be focused on international recognition and ignoring local and OA journals, which is problematic. Currently, the type and strategy for supporting published work are critical. Therefore, a policy from DHET is required to encourage, support, and promote OA and high-quality research publishing and for relevant parties, including the NRF, universities and academics, to adhere to. The study findings showed that while most institutions have policies, their practices must be aligned with the procedures. Thus, national and institutional levels need to align the rewards system more to the authors' OA publishing and quality research visibility. The per-paper publication rewards should be reviewed to ensure high-quality scholarship, and quality evaluation committees should be established.

Another reason cited by respondents for shrinking library resources was an opposing view consistent with the TOC's thinking. Respondents lamented that the shrinking of library resources was due to library users no longer requesting subscriptions or purchases of library resources because they have access to OA resources, compared to earlier years when there were no OA alternatives. Thus, the demand for subscribed resources was limited due to the increased use of OERs, IR, and unorthodox resources such as SciHub. However, Bangani (2018) argues that using unorthodox methods to access library resources is short-term. Thus, library access helps ensure long-term access to scholarly articles. Still, in an austerity-driven environment

recognised in this study, libraries need to fulfil this role holistically. Therefore, the finding of this study that non-requests by library users result in shrinking library resources may be factual.

6.2.3.2 Personal attitude

The results of this study revealed that the prevailing personal attitude towards the current crisis could be more helpful. In the interviews, respondents stated that academics demand libraries to take subscriptions and purchases to their published works, which are behind expensive paywalls. The results of this study are also consistent with the literature, with scholars such as Holderman (2015) earlier describing this as not only selfish, but also a reflection of the requestors' narrow view of the library's purpose, especially in an austerity environment where individual budgets are directed towards serving a large population.

Another challenge that reportedly put pressure on the budget was the hoarding mentality. For example, academics demanded all field titles in their subject area in print and online formats. The behaviour can be described as a lousy culture of the university system, as it keeps spending funds on duplicated and sometimes unused resources. University libraries are, thus, unnecessarily burdening the already limited library budgets.

Respondents observed that academic personal attitudes shrank library resources, in that requests come to libraries directly in most institutions studied, without being considered for economic relevance and sustainability by relevant school or faculty bodies. Librarians are then expected to comply or find themselves in unnecessary conflict, trying to defend their rationale for not fulfilling the request.

Another unbecoming user behaviour illuminated by respondents relates to how academics make information accessible on the learning management system. For instance, when academics pay DALRO fees to distribute specific publications, they waste money since sometimes the library already has access to them.

6.2.3.3 Security of library resources

The security system of most libraries in SA was cited as a significant reason for shrinking library resources. Respondents reported that some users steal print resources and do not return

borrowed books, thus contributing to the shrinking library resources. These findings are corroborated by scholars such as Obi & Okwu (2014). They argue that the extent to which a university can control its internal resources is determined by its security system. This can be seen as poor management for the university library, as libraries and archives must have safety and security plans by installing electronic article surveillance alarms to monitor items at the doors (Idakwo, 2019; Itheme et al., 2021). University libraries, therefore, need a more robust security infrastructure that needs to be upgraded.

6.2.4 Scholarly communication transformation

Scholarly communication transformation was discussed in light of the information explosion, format shifting, and IR, OA and OER impact on library resources.

6.2.4.1 Information explosion

This study found that the equally compelling OA resources are bridging the gap by covering for the shrinking paid-for resources. However, Campbell et al. (2022) found that the information explosion, particularly in OA publishing, means that authors pay more APCs and libraries pay more for subscriptions. These increased costs on both sides need to be mitigated by the SARULs, as the impact on library budgets is unprecedented. The study data also showed that the information explosion has led to confusion and conflicting positions on how researchers within SARULs should respond. From an operational view, librarians believe that researchers in SARULs are lagging in adopting OA publishing.

On the other hand, data collected showed that the university leadership needs the transition to be managed appropriately. One DVC:R suggested, for example, that the change should not be rushed; it must be an evolution, not a revolution. The DVC:R argued that revolutionary change could cut universities from vital research knowledge. On the other hand, librarians reported that they do not want an evolutionary change. One respondent said, *“We want to disrupt the publishing industry as we do not have the time and money to feed the double-dipping publishers.”* It is clear, from the study results, that these two sides want to stick to their different position. Meanwhile, library budgets are affected, and resources are shrinking. A consensus must be found to save the library and, in turn, the academy.

In support of the librarians' need for a revolutionary change, Schimmer, Geschuhn & Vogler (2015) argue that the global subscription investment is enough to support the transition OA model. The challenge is adjusting and proportionating to the needs of researchers as OA publishers instead of researchers as readers. This dilemma has been illuminated in this study.

6.2.4.2 Format shifting

The results showed that the increasing demand for electronic resources has disproportionately affected print library resources. Library collections moved from print to electronic resources and from a budget-to-pay-for access to a budget-to-pay-for publishing. Therefore, a general reduction in printed resources favouring electronic resources was observed. The data showed a clear pattern of preferences inclining towards electronic resources in all SARULs since 2014. Previous library research has mainly focused on migrating from traditional to digital libraries (Obi & Okwu, 2014) when reflecting on coping strategies for austerity (Mehta & Wang, 2020). Accordingly, several libraries have sacrificed the budget for print resources in favour of electronic resources. This development may require investment in training and technology to meet the new challenges. For example, the library staff must be trained to understand the infrastructure in the electronic environment and the electronic resources licensing models.

More broadly, the format shift transforms libraries from owners to leasers of mass electronic collections. Furthermore, as already indicated, this shift presents academic libraries with deliberate challenges in managing digital collections. For example, they need to bridge the gap between the haves and have-nots regarding ICT infrastructure, for users to access resources on and off campus. Format shifts could negatively impact libraries' ability to deal directly with publishers of e-resources. Contrary to the above assertion, previous research by scholars such as Obi & Okwu (2014) argues that format-shifting challenges the ability of academic libraries to fulfil their traditional role as holders of scholarly records. Respondents noted that electronic resources are, on balance, expensive compared to print resources.

In particular, this statement may indicate that this transition does not guarantee that library resources will be preserved and available for future use. This concern was expressed by respondents, who mentioned that there is no guarantee that the OA website would be available in the future. Furthermore, promoting e-resources favours the interests of the publishers and journal article owners (Mehta & Wang, 2020), as libraries would require excessive copyright

fees (Yuan, Ballegoie & Robertson, 2018). For example, digitising copy-protected or old articles to another format by converting video home system tapes to compact disc or digital video discs would require a license.

6.2.4.3 IR, OA and OERs

This study showed that all institutions had IRs and used OA and OERs, in line with Bangani's (2018) argument that OA exposed many online resources hidden in libraries or academics' drawers. IR meant that resources the library typically had to pay to access through a pay-walled journal were available free of charge. As part of the information literacy programmes, librarians instructed users on accessing IR from various institutions and IR archives and indexing services for specific subject areas — for example, PubMed for Life Sciences and ERIC in education. The data showed a significant growth in the electronic collection through IR, OA, and OERs, which are constantly added to the library websites. Therefore, library resources are shrinking to a person looking at physical collections, but resources for access are growing. Respondents observed this and advised that subscriptions and purchases were shrinking, but resources to access were not shrinking.

Concerning OA and OERs, results showed that library users no longer requested library subscriptions to resources because they accessed them as OA and OERs alternatives. Users did not care whether access was through legal or illegal channels. In terms of scholarship quality, Björk & Solomon (2012) earlier found that OA journals, particularly those indexed in Web of Science and Scopus, are increasingly demonstrating comparable scientific impact and quality to subscription journals, particularly in biomedicine. The fact that no new or few print resources were added due to austerity budgets meant that library resources shrank over the years.

6.3 Optimising strategies

Respondents indicated that the current optimising strategies were migratory in their approach. Respondents had mixed views when asked if they felt the existing methods were sustainable and successfully done in their institutions. Some respondents from three institutions revealed that implementing optimisation strategies was strategically aligned toward electronic resources. Questions arise regarding whether austerity budgets did not impact print resources or whether universities abandoned traditional libraries during austerity. As a result, debates have arisen regarding the effectiveness of the current strategies.

An ATLAS.ti 22 electronically based thematic content analysis of the six institutions was used in this study to analyse how different institutions responded to the austerity budget crisis and their coping strategies. The qualitative nature of this study enabled them to explore and discuss in-depth the challenges they faced and the coping strategies they implemented. This study provides an empirical contribution to the ongoing debate on austerity budgets and their impact on library resources. By identifying the most typical factors affecting library resources through a detailed comparative case study analysis, this study aimed at providing a basis for addressing library resource issues in university libraries.

There is much discussion about the impact of austerity measures on library resources. Although several libraries in SA have practically lived with austerity budgets in recent years, little priority was given to libraries over other economic and social services (Shepherd, Petrillo & Wilson, 2018). However, a closer analysis of both literature and primary data showed that the commitment of budgetary allocations to maintaining and increasing library resources was inadequate. For the above reasons, it becomes increasingly necessary for university libraries to adopt innovative and sustainable ways to survive in an austerity environment.

It is well-known, from the literature, that budget cuts affect library resources. What remains unknown and urgently needed are sustainable optimisation strategies. The results of this study showed that the budgets during austerity have led to various adjustments that SARULs are implementing in trying to cope with this crisis. The findings of this study showed that libraries had been subjected to much tighter spending controls and different coping strategies than in previous years. This study argues that thoughtless reforms without adequate planning and evaluation negatively impact critical components of the university, such as print resources and the archival usefulness of the library collections. Moreover, while other institutions do not have well-defined strategies, results were categorised into six themes: internal library processes and procedures, fiscal responsibility, internal academic mindset shift, university policies, publisher transformation strategy, and government policies. As discussed below, the six themes are part of SARULs' effort to cope with the current budget constraints.

6.3.1 Internal library processes and procedures

The library's internal processes and procedures were revisited to maximise the available budgets. Interestingly, most respondents acknowledged that most optimisation strategies reside in the libraries and are carried out by the librarians, an attribute of the TOC (Simsit, Gunayb & Vayvay, 2014). Literature suggests that many institutions must change, adapt and modify library processes, procedures, and policies to reduce unnecessary spending. There is a need for librarians to focus on providing needed resources and avoid the desire to get all available resources from publishers. (Mehta & Wang, 2020). The findings on the library's internal processes and procedures revealed seven strategies, namely, monitoring usage statistics, avoiding overlapping content, trials, and stakeholder feedback, alternative access models, learning as we go, negotiating with publishers, and staff development. These strategies are discussed in the narrative below.

6.3.1.1 Monitoring usage statistics

An analysis of primary data showed that most institutions studied rely on usage statistics to develop and manage their collections. According to Mehta & Wang (2020), usage statistics help libraries focus on material demand instead of availability. There is, thus, a need to realign internal processes and procedures to monitor usage statistics. As indicated earlier, a usage-based approach involves monitoring usage statistics, which can require expensive infrastructure while taking a long time to implement.

Furthermore, the method can be misleading if stakeholders view statistics as an end rather than a means to an end. It is essential to point out that analysing usage statistics has its weaknesses. As McGrath (2012) found, out of 100 downloads, only 65 were desired because the system overestimates downloads when users switch from default Hypertext Markup Language (HTML) to PDF. According to McGrath (2012), Elsevier led the way in overestimating downloads, while Wiley and many other publishers overestimated by about 10%. To mitigate this, the results of this current study showed that institutions should combine usage downloads with bibliometric indicators and subject in mind as well as question if the resources cover a niche research area or a broad teaching and learning area.

The study found that big deals were subjected to usage statistics analysis. Thus, SARUL institutions had to cancel some in favour of single title subscriptions or smaller packages to preserve their budgets. These results are consistent with studies by McGrath (2012) and Mongeon et al. (2021), who conclude that big deals are often cancelled because they are not financially viable. By way of explanation, academic libraries sometimes pay a high cost for less-used journals. Considering the situation described above, university libraries subscribing to big deals end up skewing library collections in favour of journals rather than books and, at times, exhaust budgets at the expense of newly-needed library resources. The literature reviewed and this study's results consistently combine usage statistics and journal subscription costs as crucial factors to consider when cancelling library subscriptions. However, they differ in the use of bibliometric indicators.

Scholars such as McGrath (2012) and Mongeon et al. (2021) have highlighted that using bibliometric indicators at the institutional level is critical to library subscription decisions. Examples of institutional-level bibliometrics mentioned were the SFTAR, citation data, feedback from relevant users, journal reshelving, and ILL requests. McLean & Ladd (2021) add the number of articles published by their researchers in specific journals. In contrast to the above, this study's results suggest that combining usage statistics with global bibliometric indicators is crucial when cancelling subscriptions. The specific global bibliometric indicators cited were the journal impact factors, the institutional level indicators, and the SFTAR, which are downloads.

Another difference is that in this current study, the analysis of usage statistics and decision-making took place in the individual institution and did not involve the local consortium, the SANLiC. At the same time, literature shows that other library consortia, such as RLUK, are taking the lead. According to McLean & Ladd (2021), as of 2017, the SPARC began listing institutions and consortia, cancelling big deals after value analysis. Mongeon et al. (2021) stress that bibliometric indicators should be considered complementary rather than as alternatives, an approach that shows the value of the journal's 'scholarly use' through citations, 'pedagogical use' through downloads, and 'reputational use' as mentioned in the institutional surveys. This study showed that this triangulation of bibliometric data, usage statistics downloads and survey feedback proved critical in optimising budgets. Triangulation mitigated disciplinary-specific biases in citations and downloads of historical or current journal reputations from surveys. In this way, cancellations and collections development decisions were factual and well-informed.

6.3.1.2 Avoiding overlapping content

The results showed that content overlap analysis was used as an optimisation strategy. The desire for unique content for each purchase or subscription drove librarians to the content analysis of all new and existing library resources. The study results agree with Sjoberg's (2017) observation that the coverage dates for all overlapping titles need to be checked. When the matching titles had an embargo period, academics were asked to seriously consider the embargo period and advise the library on acquiring or subscribing to the title. The results argued for not subscribing to embargoed titles and fulfilling requests through alternative access models, as discussed in 6.3.1.4 below. The results indicated that budgetary savings were realised by cancelling aggregator databases, which had substantial overlapping content, individual titles available in databases, and packages with embargo periods between 1 and 12 months. Academics conceded to these cancellations as it made economic sense, and they could subscribe to new resources against the cancellations.

Ritterbush (2012) previously suggested conducting overlap analysis before trials using the Serials Solutions application to identify the uniqueness of the resources. The results of this study mentioned the continuous assessment of the collection and cancelling obsolete or less used titles and replacing them with needed titles as an optimisation strategy. In this way, budgets are directed towards needed and active resources.

6.3.1.3 Trials and stakeholder feedback

Trials and stakeholder feedback saved library budgets by avoiding unnecessary acquisitions or subscription expenditures. This study found that librarians sometimes make assumptions about user needs. There was a need for formal user studies in addition to the standard survey to identify what the users wanted and to meet the expressed needs. However, inclusive collection development committees were non-existent or not adhered to for effective trial participation. Library resource trials were a significant way to gain insight into user needs. For example, trialling all new resources was mandatory before new resources were purchased or subscribed to. Trials help to determine the resource's suitability for current teaching, learning, community engagement and research needs. In this context, university libraries must understand, analyse, and keep track of user behaviour to protect the university's financial resources from unnecessary expenditures. Scholars like Emanuel (2013), Lener & Gilmore (2019) and

Ritterbush (2012) agree with the findings of this study, noting that the rising cost of library resources makes trials a significant part of the collection development process.

The results of this current study have also shown that trial participation and feedback from the relevant academics are crucial. In this study, findings showed that the purchase or subscription was only made if the relevant academics confirmed the usefulness of the resources. While participation and feedback were considered necessary, respondents in this study emphasised the timing of the trial, publicising the trial on relevant platforms and creating appropriate links to the trial from multiple platforms. Librarians reported that checking the access throughout the trial period and collecting usage statistics as a holistic approach was equally crucial for insightful outcomes. Lener & Gilmore (2019) add that a systematic approach to library resources trials is not over-elaborated, as omitting one step can lead to incorrect results. By way of explanation, no or minimal usage could mean low interest from the relevant user group, ignorance of the trial due to lack of strategic promotion or access and linking problems to the trial.

The findings of this study emphasize the significance of well-organized trials with strict adherence to the established steps laid down to achieve savings in library budgets. Budgets can only be saved if trials result in the purchase or subscription of only the needed resources. The trial usage statistics provide information about the resource's usefulness to the university's teaching, learning and research functions. If academics do not participate in trials, this may result in less used resources that can be accessed through alternative ways being purchased. However, Ritterbush (2012) earlier pointed out that no more than three trials should be scheduled simultaneously to avoid trial fatigue and maximise participation and feedback. Bhatt (2015), however, recommends no more than two simultaneous trials and stresses that users must have a clear understanding and awareness of the trial to make the trial time worthwhile.

While the results of this study showed trial publicity/promotion and management on library websites and social media, library literature added screen casting, also known as screen capture, using, for example, Jing, a free website used for recording and publishing screencasts (Emanuel. 2013), or Trello, a free web-based project management software to manage trials (Lener & Gilmore, 2019), WordPress blog and Qualtrics survey (Ritterbush, 2012). It will be helpful for SARULs to incorporate free software and websites into their trial management processes.

6.3.1.4 Alternative access models

Austerity budgets have driven librarians to think of alternative routes to gain access to paywalled resources. This current study showed that library budgets could be saved if libraries adopted alternative access models to obtain needed resources. Green (2019), Martín-Martín et al. (2018), and Piwowar et al. (2018) all agree that subscription content accounts for half of what researchers access via legal channels. The other half is available through inter-library loans, preprints, browser plug-ins that find free versions of pay-walled content, and social channels like ResearchGate. In addition, OA routes are discussed in detail in section 6.3.3.1 and 6.3.3.2. Other alternative sources explicitly mentioned in this current study are browser plug-ins, social media, PPV, and ILL. According to Fought (2014) and Sjoberg (2017), PPV was a viable and economical alternative access model. Results showed significant savings when subscriptions to some resources were cancelled and needed articles were obtained through PPV or ILL. McGrath (2012) earlier mentioned that alternative access should not exceed current expenditure minus 15% as most downloads were attributed to ‘just in case’ and never used by the users. Results of this study showed that the institution that cancelled big deals in favour of PPV and ILL achieved this.

After considering all contractual agreements and getting legal approval from the relevant publishers, a database of all PPV-acquired materials was created. The PPV database was accessible to the registered students and staff of the institution so that money could be saved in the future by avoiding duplicate purchases. In the current study, PPV enables better deals to be negotiated with Elsevier and Wiley, a practice realised in McGrath's (2012) study.

6.3.1.5 Learn as we go

The results showed that the optimisation strategies were clearly defined. However, libraries were flexible and, thus, adopted a new strategy called ‘learning as we go’. This was welcomed and implemented when there was a need to change the strategy, introduce a new one or improve an existing strategy. This aligns with the TOC, which focuses on continuous improvement. Mabin & Balderstone (2020) refer to TOC as the subject of ongoing improvement. Scholars such as Robinson & Ginder (2020) suggest that TOC aims to increase service while decreasing expenditure. The study’s results showed that respondents focus on achieving cost savings while improving access to library resources. Learning as we go and fixing as you go were effective

as the budgetary concern persists. However, this study's results cautioned the need to balance managing today's library and resource demands while addressing long-term strategy.

6.3.1.6 Negotiating with publishers

Negotiating with publishers at the individual institution or the Consortium level was mentioned as an optimisation strategy. The results revealed that substantial savings could be realised through these negotiations. The librarians interviewed reported annual discussions with various publishers at resource renewal time, mainly concerning price increases. Some also negotiated when taking new subscriptions. The negotiations always resulted in cost savings, perhaps not necessarily what the librarians had expected. The compromise was, however, worthwhile.

Scholars such as Green (2019) note that librarians have adopted a new assertive stance in negotiating with publishers by adopting no deal without OA offsets, sustainable access and cost-transparent principles. Borrego, Anglada & Abadal (2021) also found that librarians' negotiations with publishers shifted from cost containment to OA inclusion clauses, resulting in a cost-neutral contract for the Norwegian consortium, compared to the previous agreement that excluded OA fees. This study's results showed that OA-inclusive deals save library budgets because libraries no longer have to pay separately for reading and publishing fees. It suffices to emphasise the importance of librarians and publishers for the benefit of the users. Akers (2020) summarises this by stating that librarians and publishers must have a common understanding of user needs and behaviour for quality information to be delivered, accessed, and optimally used. A shared understanding helps in resource negotiations as parties negotiate as partners coming together to consider how best to serve the users as their shared customers. The data from this current study showed that librarians and publishers do not negotiate as partners. In agreement with this, Akers (2020) reports mutual distrust between publishers and librarians.

6.3.1.7 Librarians' new skills development

This study's results revealed that most optimisation strategies required new skills from the librarians. While traditional librarians focused on identifying information resources and selecting, acquiring, and evaluating published content, the coping strategy required a new approach by librarians. The findings revealed that respondents lamented that new librarians do

not consider collection development an essential part of librarianship. The new librarian for the strategies in Section 6.3.5 requires collection development, content creation skills to collect and disseminate their university research output, publishing skills, data curation and management, legal issues negotiating, and interpretive skills. Knowledge of financial management is required as per the strategies in Section 6.3.2. These skills are either new or a must-have for librarians. Anyira (2011) earlier recommended revising the curriculum for the LIS to align it with 21st-century requirements. It is reasonable to avoid new librarians with obsolete skills if a change needs to take place at the LIS school level.

The need for staff development programmes arose from familiarising library staff with changing technologies and how technology can be used in library resource access (Asif & Singh, 2020). This study found that library staff were not coping with technological advancements (Casselden et al., 2019), and therefore, respondents perceived a lack of technical expertise. The findings also revealed that some respondents struggled with basic computer skills. This was not unique to this study's respondents, as Urs (2012) earlier posited that the alliance (dalliance!) between libraries and ICTs has always been natural and often opportunistic. This shows that training and upskilling for librarians needs to be ongoing.

Closely related to the above, respondents emphasised that a lack of computer skills complicates the inevitable transition from print to electronic resources to support the process (Bangani, 2018; Bjork, 2017). It was evident that many of the participants interviewed were predominantly above forty years old, and seven respondents were at retirement age, indicating a lack of young people in library services. It could be argued that such a presence of the older generation could be linked to a failure to adapt to new technological advances. While not necessarily a problem, Hoover, Shirkey & Barricella (2020) warned that a lack of qualified staff in public libraries can lead to unnecessary expenditure.

Among the areas where staff struggle with technological changes, electronic collections and inadequate reference support are the most vulnerable. Print resources seemed to be the least affected by cuts related to technological changes (Asif & Singh, 2020). Adaptation measures are crucial when significant technological changes are involved (Yuan, Ballegooie & Robertson, 2018). In such an instance, a staff development approach is required to reconfigure the skills and experience of library staff. Reconfiguration may also involve adjusting processes and procedures in the library, to reduce unnecessary costs.

6.3.2 Fiscal responsibility

The study results showed that respondents generally believed fiscal responsibility could be critical in optimising the library budget. Furthermore, the study's results showed that austerity budgets were not a problem but common sense and should be dealt with instinctively as an adaptive method. According to Casselden et al. (2019), librarians must monitor economic trends and adapt in real-time. This study argues that the failure of librarians to be fiscally responsible makes the impact of austerity budgets even more complex. In this sense, university librarians need to be prudent with their budgets, while their policy targets should monitor the exchange rate and pay when the rand is favourable.

The respondents involved in the in-depth interviews were initially probed about the optimization strategies employed by their respective institutions. In all six institutions, respondents highlighted existing optimising strategies. However, one respondent noted that while implementing optimisation plans, they are not fixed; they learn as they go. There was also much more emphasis on short-term interventions than long-term. This was supported but cautioned by one institution's respondent who spoke of twofold optimisation strategies: institutional development and transformation plans. Caution was placed on short-term optimisation strategies, which should not be too reactive in developing collections with archival utility in mind. Library collections must be aligned with the developmental and transformational goals of the institution.

The results showed that current strategies are migratory. Respondents had mixed opinions when asked if they thought the existing methods were sustainable and successfully implemented at their universities. Respondents from three institutions revealed that implementation was strategically focused on electronic resources. Respondents indicated that a lack of financial accountability was a recurring problem at universities.

A library budget is not only a means of planning for a process for coordinating the many activities that university libraries undertake, but it is also a way of setting the university's priorities by allocating limited resources to those areas deemed more vital. This is crucial in shaping the university's future success or failure. Against this background, SARULs took several steps to position the libraries in the face of the vulnerability and risks of austerity. This

study revealed four optimisation strategies: third-stream income generation, budget control, economies of scale, and exchange rate monitoring. These strategies are not mutually exclusive and are often integrated to achieve the best results. The geometry of the combination varies and depends on several factors. The four optimisation strategies are explained in more detail below.

6.3.2.1 Third-stream income generation

The findings of this study underscore the need for libraries to be creative and innovative to generate revenue from the third-stream avenues in the face of financial constraints. Scholars such as Ogunjimi, Bello & Olaniyi (2018) observe that due to austerity budgets, academic libraries are forced to find other ways of fundraising to meet their obligations to universities regarding information resources and services. However, it was acknowledged that setting up third-stream income generation was quite daunting to librarians, as they did not have the relevant skills. This study showed that third-stream income enhanced SARULs' ability to pay for library resources. The third-stream income generation in universities aligns with the entrepreneurial university concept, which was earlier formulated by Clark (1998) and recently reiterated by Piotrowska-Piatek & Kozłowski (2020). However, Moscovitch (2016) observes that due to the effects of exchange rate fluctuations, additional funds raised through third-stream generating projects were used to reduce the damage instead of strengthening library collections. Therefore, third-stream income generation must be well thought out and a holistic approach taken.

Several universities tend to become entrepreneurial universities due to austerity measures. The results of this study confirm a deliberate implementation of income-generating projects. SARULS invested in commercial photocopying services, research data management courses, library venues and space rentals, and digitisation training courses to generate more revenue to cover costs. The income-generating services introduced by SARULs were in line with the academic libraries in Nigeria, as observed by Ogunjimi, Bello & Olaniyi (2018). However, as indicated earlier, setting up a third income generation stream can be difficult and requires additional financial resources (Mehta & Wang, 2020). Therefore, value judgment must be processed when deciding what is most economical.

6.3.2.2 Budget controls

Budget controls are another effective optimisation strategy mentioned by respondents in this study. Respondents agreed that SARULs must comply with all due diligence processes and account for every cent of their budgets. The data from this study showed that one institution suffered fraudulent activities over two years, which affected the development of the collection. Anyira (2011) and Yamma & Molloy (2021) recommend segregating duties to avoid defrauding library activities. As the term implies, the model emphasises transparency, accountability, and integrity as guiding principles for library financial management. For example, libraries must assign tasks to different staff members. One staff member places an order, and another staff member reviews it, while another staff member approves. The staff members who review and approve orders and payments must have appropriate operational knowledge to manage library finances diligently. The findings of this study showed that this due diligence promotes transparency, accountability, and integrity as guiding principles for library financial management. However, despite this recommendation, Lucky & Matthew (2021) found that libraries must make better investment decisions and stop corrupt staff and the mismanagement of funds.

The results of this study have also shown the need to change DALRO blanket licensing expenditure to transactional licensing, to save on budgets. Gray & Czerniewicz (2018) note that blanket licensing includes fees for reproducing materials that fall under fair dealing provisions, thus making transactional licenses cost-effective. Another challenge cited for blanket licenses in SA was that they seemed to favour foreign publishers. To illustrate, Gray & Czerniewicz (2018) report that in 2010, DALRO collected around USD4 million and distributed USD3 million as USD1.8 million to foreign publishers and USD1.2 million to local publishers.

This study results also mentioned hedging funds as an optimisation strategy. Data from the study revealed that two institutions hedge their funds by using international students' fees to offset the exchange rate in purchasing library resources. The results also showed that trust funds, bequests funds, prior year reserve funds, and other administered library funds are used to purchase once-off resources. Supporting library budgets from alternative funds is not unique to this current study. Frempong-Kore (2020b) reports that his research found that 91% of library collections were funded from annuities, insurances, endowments, trust funds bequests,

wills, and deferred gifts. This study revealed that these funds assist libraries in building comprehensive once-off purchased collections to serve library users. Once-off purchase resources were described as books, databases, and journal archives where the payment was made once. The library budget was, thus, used for recurrent expenditure purchases, eBook subscriptions, journals and databases that need to be paid annually to continue access. This study also showed that buying forward cover and overseas investment accounts optimised library budgets by covering shortfalls for exchange rate fluctuations and VAT.

According to this study data, continuous surveys, investigation, and targeted research were conducted regularly to determine the areas where the library budget could or could not be spent. Budgets need to be controlled and targeted to actual needs, not 'wants', which respondents referred to as nice-to-have resources. It was about balancing collection development management processes and actual needs. Strategies need to be defined and properly implemented, and the publicity of library resources needs to be improved.

The results showed that centralising budgets for all departments to be served from a general pool optimised budgets, compared to dividing them among different departments. Departments justified each order, thus saving budgets, as academics were not just ordering to spend the allocated budgets but to satisfy their real needs. As an illustration, one SARULs institution investigated how best to meet user needs. User needs were seen from the analysis of book purchases versus the actual use. It was found that almost 50% of the materials purchased were not used. The investigation concluded that researchers request resources only to spend the budget. Respondents argued that library resources could only be said to be shrinking if they were optimally used. Austerity budgets meant they could only request needed resources, which were well-used.

The findings indicated that regularising budgetary controls regarding due diligence and adherence to due processes and procedures was paramount in preventing fraudulent activities. Results also showed a need to allocate funding not only to new purchases and subscriptions, but also to growing the digitisation of print resources for widened access and preservation. This was highlighted in the 2021 UCT library fire tragedy. The findings suggest that regularising budget controls by cancelling less utilised resources and big deals favouring on-demand individual titles is an optimisation strategy. However, cancelling resources needs to be carefully considered as it may be appropriate to cancel big deals in favour of the identified less-used resources that are more expensive.

6.3.2.3 Economies of scale

Smaller institutions cited economies of scale as an optimisation strategy for the SANLiC-negotiated agreements. SANLiC agreement fees are calculated based on the number of FTEs. Smaller institutions, therefore, paid less than larger institutions due to their lower FTEs. However, scholars such as Martinez (2021) and Owen, Fletcher & Lester (2006) disagree and illustrate that smaller institutions face significant diseconomies of scale. An earlier illustration by Owen Fletcher & Lester (2006) used 1000 FTEs. It noted that costs are 9% higher at 500 FTEs, 59% higher at 200 FTEs and 173% higher at 100 FTEs than at 1000 FTEs, affecting the available resources. The fewer the FTEs, the fewer the resources.

The current study further revealed that, although economies of scale may seem controversial regarding saving budgets, being part of consortium agreements was a saving, as both small and large institutions benefited by paying reduced fees. The findings are consistent with Chisita (2017) and Tripathi & Lal (2016), who note that the primary function of a consortium is to negotiate licenses with reasonable pricing and legal terms.

6.3.2.4 Monitoring the exchange rate

The results of this study showed that approaches vary from institution to institution. While some university libraries believed strongly in monitoring exchange rates, others felt that exchange rates were unpredictable and challenging to monitor. However, libraries that monitor exchange rates and pay when exchange rates are favourable reported that they can purchase and subscribe to additional resources for the library with the savings made. Scholars like Obadan (2006) and Bank Rakyat Indonesia (n.d.) earlier agreed and emphasised the need to monitor exchange rates to promote competitiveness and improve services. Nwannebuike, Ike & Onuka (2016) aver that the exchange rate exerts positive or negative pressure on the economy. Although these studies focused on the economy at the macro level, it is reasonable to assume that the same effect will be mirrored at the library budget level.

6.3.3 Internal academic mindset shift

This study showed mixed reactions regarding the internal academic mindset shifting to OA publishing and using OA content. Rajan, Esmail & Musthafa (2022) and Urs (2012) argue that

university libraries need to reposition themselves in the digital era. This current study revealed that optimisation occurs within the university system and libraries, despite austerity budgets, through the institutional mindset shift. The findings of this study revealed two optimisation strategies within the internal academic mindset shift as coping strategies in an austerity environment. The strategies were OA options for publishing and using OA resources, IR, and OERs in teaching, learning, research, and community engagement.

6.3.3.1 OA publishing

This study revealed that using OA options by academic staff would significantly save library budgets. These results were supported by a study by Willinsky (2016), which compared costs and concluded that OA is an economically viable alternative to subscription fees, referred to as a commercial route. Wilson (2023) adds that besides the economic value, OA has incredible value in advancing scientific discovery. The data indicated that OA content is downloaded 80% more frequently than paywalled content and cited 30% more often. Although the benefits of OA to library budgets and research visibility are undisputed, this study revealed conflicting views in the conversations about adopting OA. The librarians felt that academic publishing in OA journals was lagging, while DVC:Rs interviewed felt OA uptake was on track. As mentioned earlier, according to the DVC:Rs, publishing in OA journals needs to be an evolution rather than a revolutionary change. A drastic move would lead to institutions disadvantaging themselves and cutting themselves off from vital knowledge for research. Wilson (2023) agrees that the transition to OA should not be hurried, but rather approached with careful consideration. High-quality research depends on the costs associated with production, safeguarding, and preserving the integrity of peer review and publication. This revealed a strategic misalignment regarding OA adoption within the institutions. Optimisation of library budgets through OA publication and use within the institutions, thus becomes a political issue, a game of power play between academics and librarians that significantly compromises and affects success. A common position needs to be established and supported for the greater good of the institutions. There is a need to de-northernise the publishing landscape and save library budgets by creating knowledge from OA and grey and primary literature available in archive collections in the global south.

6.3.3.2 Using OA resources in teaching, learning, research, and community engagement

This study has shown that utilising internal university resources while improving access is critical to balancing financial constraints and demand for library resources. Results showed that the OA option is nothing new to libraries but has been made more relevant with the austerity budgets accompanied by requests for more and new resources without additional funding. Closely linked to this, the current study results acknowledged that using OERs for teaching, learning, and research saves library budgets significantly. Scholars such as Gray & Czerniewicz (2018) report that SA students enthusiastically embraced OERs resources following widespread protests against rising education and textbook costs and the need to transform and decolonise the curriculum. Results indicated that OERs were a welcome relief in the educational system as they presented adaptable content that was less costly within the legal framework, thus providing an opportunity to decolonise the curriculum. According to the study results, academic requests for pay-walled resources decreased when they realised that equally compelling OA resources could be sourced and used.

This study revealed that to optimise budgets, university libraries encourage academics to shift their attention from published works to primary research resources in their special institutional collections, archives, and historical papers sections. Respondents argued that the decision was based on the realisation that journals in the global north sometimes distort the research landscape to suit their research agenda. The above findings align with scholars' observations (Eichhorn, Baker & Griffiths, 2019; Hazlett et al., 2020; Pettorelli et al., 2021). By way of explanation, this study argues that using an institutional collection of primary sources will help to produce research relevant to the global south. For example, this study revealed that a researcher discovered that Afrikaans was spoken by the people who were brought in as enslaved people, which changed the political argument that Afrikaans was the oppressor's language. The researcher changed the narrative of Afrikaans being the oppressor's language after going through the memoirs of a British Admiral of a fleet in the Cape Colony. The research enabled alternative history to be written based on primary sources. The data from this current study confirms that these primary sources save budgets, as they are mainly acquired under transfer agreements that make universities and university libraries the custodians of these collections. This study concluded that primary collections, which are free, present a vibrant opportunity for studying, researching, and writing alternative histories.

6.3.4 University policies

This study's results indicated incentives for research output, tenure, reward system policy and unblocking unorthodox sites as optimisation strategies.

6.3.4.1 Incentives for research output

The findings of this study suggest that SARULs need to incentivise researchers to increase research output. The data revealed that too much time was spent teaching and very little time on research. Improving research output was an optimisation strategy since the subsidies of SA universities are based on research output. Respondents further suggested that institutions benefit by ensuring that academics have sufficient time for research by making alternative arrangements for teaching and administrative tasks and improving academic salaries.

However, Jørgensen & Hanssen (2018) contradict these findings, noting that the researcher's skills, subject area, and effort affect research output, not the reduction in teaching and administrative functions. By way of explanation, the decline in teaching and administration tasks was attributed to less time spent on external activities, which does not influence the researcher's quantity or quality of research. Regarding the subject area, it was explained that the humanities and social sciences researchers produced more than natural science, medicine, and technology researchers. Therefore, universities must focus on other incentives besides salaries and leisure time, to attract and recruit qualified researchers in the global market. Again, a study of researchers' behaviour is required to support the implementation of programmes to increase research performance. Jung (2014) found that research output depends on the researcher's age, which he referred to as career stage and academic discipline.

6.3.4.2 Tenure and reward system policy

The results of this study have shown that there is a need to rethink the tenure and reward system policy so that SARULs realise library budget savings. According to the findings of this study, a change in the reward system will lead to the desired budget optimisation. This aligns with Green's (2019) and Lawson & Price's (2003) observation that behavioural scientists assume that the rewards system needs to change individual behaviour towards embracing OA.

Jørgensen & Hanssen (2018) believe that qualified researchers must be provided with better technical equipment, travel funding and research assistants. There is also a need to reward researchers for the time spent developing grant proposals and applying for external funding. Therefore, it can be concluded that external research grants are a welcome budget optimisation strategy.

6.3.4.3 Unblocking unorthodox sites

The results of this study reflected a consistent position among respondents regarding unblocking unorthodox sites. According to the respondents of this study, no agreements were signed with the publishers to this effect. Their users accessed these sites to fulfil resource needs that the libraries failed to meet due to austerity budgets. The literature supports the unblocking of unorthodox websites, as revealed by scholars such as Bjork (2017), Green (2017, 2019), and Wright (2017). According to Wright's (2017) tweet during the United Kingdom Serials Group (UKSG) conference, delegates confirmed the non-blocking of Sci-Hub at their institutions. In agreement, Green (2017) posits that pirated versions will flourish until publishers make legal versions accessible to everyone and available for free.

6.3.5 Publisher transformation strategy

This study found that libraries focused less on the budget and more on alternative access models. This aligns with Uloma's (2020) recommendation that libraries should look beyond budget cuts and focus on alternatives such as corporate acquisitions, IR, consortia, library cooperation with vendors, and ILL. Options explicitly mentioned in this study include libraries as publishing platforms, OA, TA, IR, consortia, and professional associations, as explained below.

6.3.5.1 Libraries and publishing

The findings showed that libraries are entering the publishing space by publishing journals, monographs, and specific textbooks within their universities and other interested universities in Southern Africa. This aligns with Muccie's (2015) observation that libraries are the ideal place for publishing, as library staff have the requisite skills since they have supported scholarly research through collections and establishing IRs. Libraries as publishers are not a new concept,

as in 2012, the library publishing coalition was founded to support the emerging field of library publishing (Muccie, 2015).

According to this study results, libraries started the OA publishing platform for local content, journals, monographs, and e-textbooks to help students who do not have money to buy them, especially e-textbooks. Respondents reported that students would, instead, not choose a course requiring them to purchase textbooks. Libraries as publishing platforms are helpful not only to students, but also to library budgets. Libraries will stop buying paywalled resources, as their students and academics will use OA resources.

This study found that four of the six SARULs (66.7%) have made significant progress using OA resources. The published journals and textbooks were used for teaching and learning at the same universities, saving library budgets. Respondents indicated that the authors and reviewers are from the same universities. In the humanities, it was noted that there had been a significant growth in primary research resources deposited in the historical papers and archives sections of libraries. These primary resources draw academics' and researchers' attention because they are free and are local content that helps rewrite SA history. According to the respondents, primary resources help de-northernise the publishing landscape and assist global south countries, including SA research, in publishing in those international journals. This study also found that the emerging quality OA resources from reputable institutions, such as MIT and Harvard, push pay-walled resources in favour of their published teaching materials. Results further revealed that two universities within SARULs collaborated with MIT and many others, publishing their teaching materials. Respondents concluded that quality resources and OA are no longer sitting in subscriptions.

6.3.5.2 OA

This study's results revealed a global shift from subscriptions to open scholarships, which requires APCs to be funded from the subscription budget during the transitional phase. The results suggest that the selected institutions are pushing the OA agenda as a solution to austerity budgets, picking up on what Willinsky (2016) call a seismic shift, transitioning from commercial payments to reading to non-commercial payments for publishing. All the universities involved in the study had signed the OA agreement. Austerity budgets have made OA a saviour from excessive subscription fees, in line with Bawack & Nkolo (2018), who say

OA is determined to control and manage the serial crisis. Respondents also felt that the digital era had made OA an easier, faster, and more open way to share research.

Results indicated that respondents stopped at nothing to promote legal and not blocking illegal OA sites. Scholars such as Bjork (2017), Bodó, Antal & Puha (2020), and Green (2017) believe that unlawful OA sites, referred to as black OA and shadow libraries, should not be blocked, as they provide access to a large proportion of the pay-walled articles. Respondents suggested that not blocking the illegal sites will level the playing field between the global ‘expert’ North and Global ‘apprentice’ South, which is lagging, as discussed in Chapter Three, Section 3.3.3. The results showed that respondents were unwilling to block illegal sites to save their budgets. Data showed that SARULs were using the black OA platforms as optimisation strategies. The two main ones used were the ASN, Academic.edu and ResearchGate. SARULs websites did not block pirated copy websites such as Sci-Hub. This study showed that SARULs were only concerned with saving their budgets and supporting eliminating paywalls and non-exclusions of their scholars from needed resources due to their ability to pay.

In support, Harris & Barrett (2019) fortified SARULs’ position, contending that as long as the funders of these sites are unknown, leading to the accusations of state deception, users can use the sites. To show support from other scholarly communication services, Ovadia (2014) earlier reported that citation management products, such as Mendeley, Zotero and CiteU-Like, now have social networking features that allow users to find and follow each other. Although the scholarly communication partners support OA, publishers are trying by all means to stifle it, as discussed in Chapter 3, Section 3.3.3. This study posits that the publisher’s attitude made respondents turn to disruptive practices. For this study, the push factor for using illegal sites was what respondents described as the publishers' cunning acceptance of OA.

According to this study’s respondents, the publisher’s acceptance of OA was questionable. While respondents envisaged it as a budget saviour, scholars like Eve (2022) and Herb (2018) report that publishers viewed it as a business model, and article fees became a distinguishing and exclusive feature. This startling position was not helpful to library budgets, thus pushing libraries into a disruptive mode to survive. In agreement, Hernandez-Carrion (2022), Hernández-Pérez, Vilarino & Domenech (2022) and Urs (2012) note that libraries are living in an age of transformative and often disruptive change.

This study observed that the specific OA optimisation strategies were divided into legal and illegal. Legal strategies listed all legal OA sites for articles, eBooks, and e-textbooks on the library website, installing a browser plug-in to unpaywall and using the OA button. Unpaywall automatically checks for available open versions of paywalled articles from its legal OA databases and provides a green tab for the researcher to click to gain access. The OA button requests a free version from the author if none is found through the Unpaywall. Information literacy training and online training guides on ASN for articles that authors share through social networks, for example, Academic.edu, ResearchGate, and Humanities Commons, are necessary. The study also recommends information literacy training on CORE, an aggregation of the world's OA research papers, open preprint repository networks, for example, PubMed for biomedical and life sciences and Arxiv for physics, mathematics, finance engineering, and others, as well as Twitter messages to #icanhazPDF, where a researcher requests unknown academics who have subscription access to download a copy and mail it to them (Bjork, 2017).

Illegal sites, referred to as black OA, especially Sci-Hub, are not trained on or encouraged in SARULs, but respondents acknowledged that these are also used. According to the respondents, they did not see any reason to block the sites as the universities did not sign any contractual agreement where they were required to do so. Nonetheless, Bjork (2017) warns that black OA indicates a fundamentally flawed traditional scholarly publishing system that has not adequately adjusted to the global research community's requirements. The suggested remedy would be to fund APCs in gold OA, which could weaken the use of ResearchGate and Sci-Hub in the future, to limit IR use to preprint manuscripts and grey literature.

6.3.5.3 TA

This study showed that SARULs were pushing for TA through SANLiC and directly with publishers who do not have SANLiC deals. The idea was to publish their research without paying APCs. The SARULs thinking was consistent with Campbell et al. (2022) statement that TA focus on OA publishing and do not provide subscription access, making them an ideal framework for open research instead of paywalls. This study revealed that the economic gains of TA have not been significantly realised within the SARULs. Respondents acknowledged that this was the way to go, as they could see the benefit in the long-run. Succinctly put, the growth of TA would not be realised shortly, and libraries were encouraged to continue with the paywall subscriptions (Campbell et al., 2022).

6.3.5.4 IR

The results of this study showed that austerity budgets had led SARULs to build and improve IRs. This agrees with Tapfuma & Hoskins (2019), who observe that IRs had become the new strategy for libraries to develop their collections. The results of this study further revealed that IRs are intended to improve access, availability, and visibility of the university's research output to a broader readership. According to Bawack & Nkolo (2018), academic libraries can ensure future sustained OA to scholarly publications by working in synergy to establish IRs of OA literature in their institutions. Through extensive audience outreach, this study echoed this position as a possibility in the distant future. However, this study emphasises proper communication to avoid unintended consequences similar to what happened in Spain, where researchers were unaware of the IRs in their institutions and did not publish articles (Borrego, 2017). IR positions were, therefore, introduced or improved in the institutions in this current study.

6.3.5.5 Consortium and professional bodies

The results of this study showed the contribution of the consortium and professional bodies in optimising library budgets. Darch (1998:10) earlier stated that few academic libraries worldwide possess the financial resources required to acquire the necessary monographs and journals. Often, they face challenges in obtaining the materials they require, let alone those they desire. According to recent literature, consortia and professional bodies are helping save budgets by sharing and providing access instead of ownership. Scholars such as Mongeon et al. (2021) have recently argued that consortia are essential for optimising library budgets. SANLiC encourages all its members to refrain from negotiating with publishers. This aligns with McGrath's (2012) observation that package negotiations benefit some more than others, leading to potential disunity of purpose that consortia must address by encouraging all members to decline to negotiate separately with publishers.

The results of this study suggest that consortia and other professional associations are helping to negotiate prices with publishers on behalf of academic libraries, to improve their purchasing power. Having exhausted internal library processes and procedures in response to the austerity problem, SARULs look to consortia and other professional bodies to achieve sustainability. The study by Casselden et al. (2019) shows that university libraries have risen to this challenge

in response to library professionals' general spirit and ability to adapt to such an economic climate.

As already alluded to, previous empirical research has shown that the rise in electronic resources threatens library resources' availability and affordability due to a phenomenon respondents referred to as 'information explosion'. (Mehta & Wang, 2020). This study established that library collections had been placed in a complicated situation due to austerity budgets, and the information explosion adds an unbearable burden on managing library resources. The findings are consistent with the earlier observation by Okiy (2005), that libraries are expected to provide users with various ICTs necessary for retrieving information from immediate and remote databases, creating a need for library cooperation and consortium initiatives.

Results further pointed out that consortia and professional bodies create an excellent critical mass or an economy of scale in prices through service negotiations with publishers and vendors. This study argues that the existence of consortia provides the necessary facilitation to develop a more resilient approach to budget cuts. However, respondents reported that these consortiums only negotiate for deals needed by many institutions rather than by one or two. In addition, lobbying for cheaper access to resources through professional bodies was considered a strategy to reduce the purchase price for e-resources, and consortia leverage greater bargaining power (Bjork, 2017). In doing so, SARULs took advantage of consortia bulk purchasing and licensing negotiations (Hoover, Shirkey & Barricella, 2020). The findings of this study showed that the involvement of consortia and other professional bodies makes a massive difference in library resources. One advantage of consortia was that they gave libraries influence over pricing. Although consortia buying is not new, it gained more adherence during austerity budgets to manage and control electronic resources. This current study's analysis focused on academic libraries' responses to challenges they confront during austerity budgets.

Respondents from large institutions within SARUL acknowledged the role of SANLiC. Nevertheless, they mentioned that SANLiC needs to find another system that is not only based on the FTEs so that they can benefit significantly from the discounts. The respondents from the smaller institutions within SARULs expressed this clearly. They mentioned that the institution purchased SANLiC-negotiated deals as they pay less due to the lower FTEs/small tier system. Authors like Hoover, Shirkey & Barricelle (2020) observe that one problem with consortium

systems is that large institutions seem to carry smaller ones. This suggests that the actual savings on consortia deals may be subjective and that more needs to be done in the other optimisation strategies to achieve substantial savings. There is a risk that the expertise and investment of universities are unevenly distributed. Ideally, universities should contribute proportionally and support initiatives without burdening the larger institutions. Unfortunately, this may not be the case, so monitoring the processes and implementing fair measures to manage consortia remains crucial in determining the next steps.

6.3.6 Government policies

Government policies regarding VAT and university subsidies were discussed, and the impact on library resources was demonstrated.

6.3.6.1 VAT's impact on smaller universities

VAT exemption was mentioned as an optimisation strategy. However, respondents expressed disappointment with the government and suggested that it needs to be considerate in their attempts to negotiate for VAT exemptions. According to Dean et al. (2020), libraries are expected to address the needs of their users. The findings of this study showed that libraries are not meeting their user needs because the government could not compromise on VAT exemption. Furthermore, the study noted, from the respondents, that the issue of VAT was serious among small universities as it was uniform.

During the interviews, respondents indicated that libraries sought to negotiate for VAT reduction after realising that the government was not considering removing VAT. Scholars like Kopec (2020) had a similar view that VAT reduction is an indirect funding tool, assuming that reduced VAT results in reduced book pricing. Therefore, it is essential to keep negotiating with the government regarding VAT on electronic resource reduction or removal. However, the literature indicates that negotiating with the government for VAT exemption is a substantial undertaking, given the intricacies of the processes involved (Oishi, Kushlev & Schimmack, 2018). In this sense, government policies on VAT pose a challenge and a threat to the library resources and prices of goods in general and, in more severe cases, to inflation. Therefore, universities must negotiate with the government to find sustainable and innovative solutions to shrinking library resources.

6.3.6.2 Government subsidy to universities

Government subsidies aim at reducing the financial burden on universities, which helps academic libraries to build and expand library resources. For example, libraries receive a higher budget when the government provides more funding to universities. In SA, subsidies for universities are linked to research output (Department of Higher Education and Training, 2019 & 2023). For example, if your output is high, you get a high subsidy from the DHET. Scholars such as Mpofu & Ndlovu-Gatsheni (2020) concluded that research outputs provide resources and income to institutions as SA government funding to universities is performance-based. Thus, the high subsidy helps libraries acquire and subscribe to new knowledge so that researchers can create new knowledge and publish it in journals.

Even with the above macro issue, the government can support SARULs by negotiating with publishers at a national level. Respondents suggested that national agreements could make a difference in saving library budgets. For example, universities in countries like Sweden, Germany, the UK, and the USA have successfully obtained favourable deals through government agreements with publishers (Pedersen, 2018). The results suggest that national agreements with publishers can help save library budgets through critical mass negotiations.

6.4 Summary of the chapter

The study concluded that fiscal responsibility, eliminating inefficiencies, and reviewing internal library processes and procedures are considered immediate and essential approaches to optimising library budgets. Internal changes in academic mindset shifts, publisher transformation strategies, and government policies are considered long-term and ongoing approaches. The findings also revealed that the link between the scale of library resource cuts due to fiscal responsibility and the gravity of the current crisis is difficult to assess and cannot be pinned on one cause. In line with the TOC's thinking, the study found that the SARULs challenges were multi-faceted and related to the explosion of electronic resources in scholarly communication. Therefore, optimisation strategies are needed in all areas identified to optimise library budgets and strengthen the value of libraries in universities. According to the TOC, continuous improvement is promoted by identifying new constraints and working to optimise them.

The study results showed that publisher prices continued to rise during the austerity environment and ongoing economic disruption over the study's five-year period, from 2014 to 2018. As mentioned earlier, 2014 saw the introduction of VAT on electronic media in SA (CHELSA et al., 2014). The 2015 academic year was marked by the #feesmustfall protest movement Svicevic (2015), and in 2016, the rand reached an all-time high against the dollar (Trading Economics, 2018). In 2017, universities sought funds to cover the 0% increase in tuition fees; in 2018, there was another 1% increase in VAT. As the study results revealed, the situation was further exacerbated by the global decline in demand for print resources in favour of expensive electronic resources.

The study's findings showed that SARULs have demonstrated their ability to adapt their roles in response to changing circumstances. They were essential in promoting their universities' teaching, learning, research, and community engagements. Their effectiveness is critical to the student experience. It was envisaged that more constraints would be identified, as well as relevant solutions. TOC acknowledges that several constraints contribute to one perceived problem, and institutions work on solving the major constraint at any given time and then move to solve another.

The results also showed that an austerity budget exposed financial disparities between the SARULs, putting pressure on small universities regarding FTEs. Although the results have shown that library resources were not shrinking but changing form, adopting the current optimisation strategies by the SARULs was a welcome development. However, if the SARULs could only cope with the existing methods without a sustainable optimising strategy, they would possibly struggle in the long term, as electronic resources are expensive. It is hoped that the optimisation strategies adopted by the SARULs during the austerity environment can be maintained and improved in the hope that all SARULs can adapt and adopt methods to survive austerity from each other. In the same vein, university libraries' policies should focus on fully utilising their resources and promoting using OA resources. Using OA resources to save budgets has been confirmed by studies from scholars like Mehta & Wang (2020) and Obi & Okwu (2014), who concluded that libraries saved their finances by creating and utilising OA resources instead of articles licensed in traditional databases. There are two contrasting views between the literature reviewed and this study's results. While literature revealed that library resources were shrinking, the study's results showed that resources were changing form. The

other contrast which was noted from the literature was that austerity budgets were bad, and the study's results noted them as a necessary consequence that would require all the stakeholders to think differently while still ensuring that the library receives the necessary resources.

CHAPTER SEVEN

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

7.0 Introduction

This chapter summarises the study findings, draws conclusions and provides recommendations. The chapter ends with the study's contribution to the body of knowledge and suggestions for further research. The study investigated the optimisation of South African University Library budgets in an austerity environment. The following research questions guided the study:

1. What were the reasons for shrinking library resources besides austerity budgets?
2. How were optimisation strategies implemented?
3. How useful was the TOC in optimising SARULs budgets in an austerity environment?

7.1 Summary of the study's findings

This section summarises the study's findings on the reasons for shrinking library resources, optimisation strategies and the usefulness of the TOC in optimising budgets in an austerity environment. This study revealed that the respondents' biographical information showed they qualified to provide credible data. The summary of the results follows the order of the research questions as presented below.

7.1.1 Reasons for the shrinking library resources

Several reasons were given in line with the TOC, which states that any organisation has multiple constraints, and the focus needs to be on the one considered as the primary constraint. Once the primary constraint is removed, the focus shifts to another identified constraint. Respondents' answers to continuously identifying shrinking library resources yielded thought-provoking reasons: economic factors, government policies, institutional culture, and scholarly communication transformation. However, it is essential to highlight the critical finding of the study, that only paid-for resources were found to be shrinking. Library resources for access did not shrink because of the information explosion caused by equally compelling OA resources. The finding that paid-for resources were shrinking was consistent with the research problem of this study, as stated in Chapter One, Section 1.2.

Economic reasons for the shrinkage of library resources were exchange rates, publishing models, and economies of scale, which significantly impacted library budgets. Exchange rate fluctuations were considered the worst, most severe and unsustainable. Publishers were described as only concerned with their profit margins, pricing and models, and were cunning with their approach to APCs. According to this study, publishers are moving from paywalls (subscriptions) to playwalls APCs, which is not helpful to library budgets.

On the government policy on VAT and subsidies, respondents were concerned about introducing a flat tax paid regardless of income, which has affected all institutions, especially the smaller ones. This study's results confirmed VAT's negative impact on library budgets, which SANLiC documented as a 40% loss of purchasing power for library budgets, as discussed in Chapter Six, Section 2.2.2.1. Government subsidies to universities have declined over the years, as discussed in Chapter One, Section 1.1, Chapter Three, Section 3.2 and reported by the SARULs.

Institutional culture regarding the rewards system and personal attitude to publishing in paywalled and prestigious journals to obtain rewards was hurting library budgets and, thus, contributing to the shrinkage of library resources. When looking at TOC, it was interesting to establish that users were not requesting libraries to purchase or subscribe to resources, as they accessed them through OA alternative legal and illegal channels.

Regarding personal attitudes, academics insisted that libraries purchase and subscribe to expensive paywalled resources. Academics demanded subscriptions to their published works, paid DALRO for resources to which libraries already subscribed and requested libraries to pay for both print and electronic formats. As projected in the results, this behaviour resulted in a deviant culture that contributed to the shrinking library resources. Library security was inadequate, as some users stole printed resources and did not return borrowed resources.

The change in scholarly communication transformation consisted of an information explosion and the shift in formats contributed to the shrinking of library resources. Library budgets paid more for APCs and subscriptions. Regarding format shifting, libraries experienced increased demand for expensive electronic resources. Library budgets also need to support staff training for digital resources, ICT infrastructure for users to access resources on and off campus, and

copyright fees for digitising copy-protected materials into different formats, such as video home system to compact disc or digital video disc.

As for IR, library users now had access to only a few resources, which meant that libraries did not pay for new additional resources. On a linear level, if the library added a certain number of books per year, this would decrease, giving the impression that library resources were shrinking. On count, the resources were shrinking, but resources for access were increasing.

7.1.2 Optimising strategies

This study showed that the optimisation strategies were migratory in their approach, including the reasons for shrinking library resources. It was emphasised that librarians must be agile to remain relevant to the academy, a process consistent with the TOC. The TOC is based on the continuous improvement approach. In this study, the institutions had several common and unique optimisation strategies, summarised below.

The librarians did internal library processes and procedures to avoid and reduce unnecessary expenditures. Usage statistics were analysed for new resources on trial and old subscriptions to ensure that resources were purchased or renewed as needed. To provide a sound rationale for cancellations, usage statistics were combined with global and local bibliometric indicators and feedback from the relevant users. The triangulation provided the basis for budget optimisation, as usage statistics overestimation shortcomings and subject biases were mitigated.

The library collection was analysed for overlapping content, and titles were cancelled and replaced with unique content. All new resources were trialled strictly to the steps laid down, and only needed resources were purchased or subscribed to, thus saving library budgets.

Alternative access models to access paywalled resources have been introduced to save library budgets. Although illegal websites like ResearchGate and SciHub were not encouraged or supported by both publishers and institutions, their access was not blocked as an institutional policy.

Library budgets were also saved by librarians negotiating at institutional and consortium levels through SANLiC with publishers. The negotiations were mainly about price increases and the inclusion of OA in new and renewal deals. This study has proven that libraries optimised their budgets by entering the publishing environment and publishing journals, monographs, and institutional research output through their IR. The study observed that staff needed to be capacitated with new skill sets as an optimisation strategy to effectively fulfil user needs in an austerity environment.

This study found that austerity budgets are not constraints but common sense and that librarians must be capacitated for fiscal responsibility, to function. Budgetary controls need to be put in place and strictly adhered to. Again, due diligence processes should be followed to avoid fraudulent activities. Creativity was encouraged to generate additional library income, monitor the exchange rate to pay when favourable, and save budgets. It was pointed out that any short-term optimisation strategies must not compromise the archival usefulness of library resources regarding collection development and management.

While librarians carried out most optimisation strategies, academics also played a role, particularly in OA publishing and adopting OA resources in teaching, learning and research. Using OA resources optimised library budgets as the library stopped paying for access to paywalled resources, since users were using free resources. Although this study has proven that OA is an economically viable alternative to subscription fees, there was a misalignment in the strategic direction of the launch. Librarians wanted a revolutionary approach and felt academics were slow in adopting OA. On the other hand, the DVC:Rs wanted an evolutionary process and preferred that academics avoid radical changes that could disadvantage the institutions of essential knowledge for research. Because of this misalignment of strategic position, this study revealed that no significant changes were achieved.

Another optimisation strategy was realised when libraries entered the publishing sector. Libraries started or strengthened the publication of their institutional research output, journals, monographs, and e-textbooks. The library archives, special collections, and historical papers were deliberately and consciously publicised, and academics were encouraged to use them. Turning to these primary resources was encouraged, as it was felt that free local content would help de-northernise the publishing landscape. Respondents to this study noted that journals in the global north shape the research landscape to suit their research agenda, which makes it

difficult for researchers in countries in the global south, including SA, to publish in international journals. Respondents were of the view that using primary resources would help rewrite the SA history and produce research relevant to the Global South.

TA was seen as an optimisation strategy that was yet to achieve the desired result in this study. Respondents acknowledged that it was a way to avoid the publishers' 'double dipping' when libraries pay both APCs and subscription fees for the same content. Libraries were fighting to pay APCs instead of subscription fees, to optimise budgets.

This study showed that participation in consortia and professional associations was essential for optimising library budgets. Consortia and professional bodies created a critical mass in price negotiations with publishers. Institutions were encouraged to negotiate only within SANLiC. However, it was acknowledged that savings from consortia were subjective, as large institutions complained that they were carrying smaller institutions in terms of the price they pay. In comparison, smaller institutions were happy to pay less and have the same access to resources. Despite this argument, both large and small universities agreed that consortia negotiations made significant savings.

University policies on research incentives, tenure and reward systems and unblocking of unorthodox policies were discussed as necessary to optimise budgets. Government policies on VAT and subsidies that include VAT amounts were needed as optimisation strategies for library budgets. As an optimisation strategy, it was demanded that the government exempt academic institutions from paying VAT and increase subsidies to educational institutions. Respondents urged the government to negotiate national agreements with publishers, a notable optimisation strategy.

7.1.3 TOC

This study revealed that the library activities' practices were consistent with the TOC principles of continuous improvement and finding a solution to one constraint after another. As libraries evolved, the constraints and solutions were also changing. Librarians in this study mastered this and constantly sought new ways to alleviate constraints.

7.2 Conclusions

In this section, the study concludes the study's findings that investigated the optimisation of South African Library budgets in an austerity environment. The study examined the reasons for the shrinking library resources and what optimisation strategies were in place. The study made several observations, as explained in the summary section above. Conclusions could, thus, be drawn as follows:

7.2.1 Reasons for shrinking library resources

Not all library resources were shrinking. Only paid-for resources were shrinking, while resources to access were increasing due to the current OA information explosion. However, several reasons besides austerity budgets were identified for shrinking the paid-for library resources.

7.2.2 Optimisation strategies

Several optimisation strategies were reported to be already operational in the SARULs. It was interesting to note that optimisation strategies were not limited to librarians, but the DVC:R, consortia, SA government, publishers, academics, and students had their unique roles to play. Some of these groups played their roles diligently. However, it is essential to note that there were contradictions and misalignments regarding the strategic direction and implementation of the optimisation strategies. These differences could be attributed to the absence of guiding policies at national and institutional levels, which was of concern. Another concern was that some of the optimisation strategies were not long-term strategies. A remarkable conclusion of this study was that most respondents argued that austerity budgets were not bad, as they were a necessary evil to bring a paradigm shift into librarians' and academics' thinking. With the austerity budget, librarians and academics moved into alternative access models, mainly OA resources and publishing spaces and stopped feeding profit-making publishers. Institutions moved away from paywalled resources and started the narrative of decolonising education, which was aimed at creating, using, and promoting local content.

7.2.3 TOC

While the study provides an extensive theoretical foundation, this research sought to identify the reasons for the shrinking library resources and the optimisation strategies generated through the data. The link in some areas between findings and theory may be limited to some extent. However, the TOC principles of continuous improvement have been seen in this study through the respondents' identification of constraints and implementation of optimisation strategies. It can, thus, be concluded that TOC is useful in the library environment.

7.3 Recommendations

This section recommends implementing policy and practice strategies to optimise budgets in an austerity environment. Given the findings of this current study, the following recommendations are suggested:

7.3.1 Recommendation for policy

Recommendations on policy related to the government, DHET, CHELSA, Universities South Africa, SANLiC and the individual libraries are given as explained in the following narrative:

7.3.1.1 Government policy on VAT

Government policy on VAT on electronic resources was strongly needed. A complete removal of VAT on e-resources and government allocation of VAT-inclusive subsidies are suggested, or introducing a pay-as-subsidised approach, like the income tax scenario. This study observed that institutions with few FTEs received the least subsidy but paid the same 15% as those with high FTEs and high subsidies. This recommendation was informed by the data that showed that the introduction of VAT had impacted libraries in both the literature review and the results of this study.

7.3.1.2 National policy by DHET

A national policy by the DHET on OA publishing, which promotes local journals and local content, is required. The current study uncovered that there was a disjuncture in terms of the OA strategic direction. NRF focused on international recognition above local recognition, thus placing local journals on the back seat. The DHET promotes local journals through the

accredited list. Selected institutions were promoting the decolonisation of education through local content and local journal promotion. These differences in the strategic direction need to be aligned at the national policy level for meaningful OA gains to be realised.

7.3.1.3 CHELSA policy on library security systems

Failure to upgrade the library security systems has raised questions about the commitment to preserving library resources. Due to poorly maintained or, in some cases, non-existing security infrastructure, library resources are vulnerable to theft. Hence, optimising library resources and security on library resources depends on the conduciveness of the library environment. Upgrading security infrastructure such as security gates, cameras, and tattle tapes on all print resources is also an urgent measure for policy consideration. This recommendation was informed by the study's data which attributed the shrinking of library resources to theft.

7.3.1.4 CHELSA policy on inclusivity in library collection development

CHELSA policy on inclusivity in library collection development membership composition was highlighted. This current study revealed that lack of inclusiveness by university libraries negatively impacts their capacity to deal with library resource challenges fairly. This means substantial intervention efforts are required to promote committee formation and develop a broadly representative library procurement group that is inclusive and diverse. Furthermore, the committee members should be trained to understand and respect certain practices to avoid undermining university and library rules, thus creating an environment for potential multi-stakeholder conflicts.

7.3.1.5 Universities South Africa policy on LIS curriculum

Universities South Africa's policy on the LIS curriculum was regarded as overdue. The curriculum on LIS must be adapted to the needs of the 21st century and aligned with a strong alliance between libraries and ICTs as per the respondents of this study's emphasis.

7.3.1.6 SANLiC policy on TA

SANLiC policy on TA SANLiC needs to negotiate for unlimited TA as a matter of policy. This would enable all interested authors to have their eligible articles published in OA journals. The results of this study noted that accepting capped TA in any form or shape will exclude some authors and articles.

7.3.1.7 Library collection development and management policy for the libraries

Library collection development and management policy within the individual libraries must be reconsidered. The policy must have a straightforward procedure focusing on user needs, not just expensing the allocated budget. Most conflict, especially regarding respondents' attitudes, could be avoided by redirecting requests to align with the policy.

7.3.1.8 Policies and practices supporting Batho Pele principles

Policies and practices supporting Batho Pele principles, promoting staff development and training, institution-building and management, and consultation are critical for success, as Chapter Three, Section 3.3 explains. University libraries must provide resources for continuous and ongoing student training and development to enable them to work in a changing, technology-driven environment. Again, librarians need skills in collection development and management, collection and dissemination of research outputs, publishing, data curation and management, legal negotiations and interpretation, and financial management. These skills are a must for librarians in 21st-century libraries. To give the best service, librarians must be adequately empowered through relevant training and resources.

7.3.2 Recommendation to practice

Building a community of practice databases that involve all stakeholders helps keep and update beneficial operational practices.

7.3.2.1 Optimisation Strategies Database (OSD)

Building the OSD and placing it on the SANLiC website ensures that all valuable optimisation strategies are available in one place for consistent applications across the libraries. The above approach stems from this study's realisation that different university libraries have helpful,

unique strategies essential to other university libraries. The database of optimisation strategies could be updated regularly and referred to by all institutions as a community of practice.

7.3.2.2 Regional consortia

Libraries must organise small regional consortia to share best practices on library budget and resources management through SANLiC or CHELSA. The consortia will promote library collaborations for mutual benefit in the interest of study and research and share systems and resources, for example, revitalising and strengthening the South East Academic Libraries System (SEALS) and the Gauteng and Environs Library Consortium (GAELIC) to promote and enhance information literacy, education, research, and economic development. This recommendation was informed by the data that showed that there were no regional consortia to share best practice in SA, while literature showed that these consortia exist in other countries.

7.4 Contribution of the study

The current study contributed comprehensively to the four aspects of scholarships with the overlaps and interactions within the scholarships as highlighted in Chapter One, Section 1.4. The contribution per scholarship is unpacked in the following sections.

7.4.1 Contribution to discovery (research)

The scholarship of discovery involves generating and exposing new knowledge from research. The new knowledge generated in this study was in quadruple. The first one was that not all resources were shrinking. Only paid-for resources were shrinking, while other resources were growing exponentially, referred to in this study as information explosion. The second one was that austerity budgets were not the only reason for the shrinking of the paid-for resources. Still, several reasons were articulated in Chapter Six, Section 6.2. The third one was that using primary resources in the special collections and archival section helped decolonise the education agenda by providing content relevant to the global south countries. The fourth and last one was that there were existing optimisation strategies already in place, which have already proved helpful in saving budgets. The primary outcome of this study is sustainable optimisation strategies that are context-specific and can be used to improve library budgets in an austerity environment. Generating knowledge on reasons for shrinking library resources and

the various optimisation strategies could, thus, be a blueprint for future studies in this area; hence the recommendation in Section 7.3.2 1 above.

Another discovery from this study was that a management theory, TOC, helped solve library budget challenges. This study contributes to the literature by applying the TOC continuous improvement branch with the TP using the five-step focusing process to optimise library budgets and showing that the TOC principles worked as an excellent approach to optimising library budgets. Changes in the library and budgeting theories brought some optimisation strategies but getting a management theory brought different thinking to librarians. The thinking was that the focus needed to be on the continuous identification and mitigation of constraints, referred to in this study as agile.

The discovery that most optimisation strategies came from internal people and processes in libraries compared to external stakeholders was enlightening. Librarians in this study were vigilant in harnessing everything in their reach to optimise their budgets continuously. During interviews, some respondents reported that austerity was good, and the budgets were sufficient, but librarians needed to do their best with what they had. Although the government, publishers, researchers, and academics had a part to play, as demonstrated in Chapter Six, Section 6.3, this study revealed a paradigm and revolutionary shift in librarian thinking, as discussed in the contribution to practice below. The literature and this study's respondents consistently emphasised that staff training is a significant challenge. Therefore, the proposed interventions are a discovery that drives continuous capacity development of both students and staff.

7.4.2 Contribution to integration (synthesis)

Integration scholarship is multidisciplinary and strives to find meaningful patterns and connections. In the current study context, efforts were made to understand the optimisation of library budgets using management principles within the TOC. It was acknowledged that library and budgeting principles were previously used and did not achieve the desired outcomes. Combining management, budgeting and library principles resulted in a triangulation that enabled a new and broader understanding of the contextual approach in the study, aimed at developing applicable and sustainable optimisation strategies. After carefully examining the common challenges of shrinking library paid-for resources, the current study developed a contextual approach to optimisation strategies that reflected respondents' perceptions. The

present study adopted optimisation strategies from the respondents from their practice and implementation within their institutions. The integration of strategies such as operational from the librarians, strategic from the DVC:Rs and universities, political from the government, economic from the publishers and behavioural from the academics, library staff and students, helped in identifying comprehensive optimisation strategies.

7.4.3 Contribution to practice (application)

The scholarship of practice connects theory to practice by applying knowledge to solve problems as noted in Chapter One. The problems were solved at four levels: individuals, institutions, communities, and society. The optimisation strategies in an austerity environment developed in the present study were well-connected to the sustainability imperatives and done at all the mentioned levels. Chapter Six, Section 6.3, details how librarians, academics, and students had unique optimisation strategies at the individual level. The universities as institutions had optimisation strategies, while communities and societies like consortiums had different optimisation ways. All the optimisation strategies sought to promote free or affordable access to library resources. This was broadly achieved through promoting the use and publishing of OA, changing the publishing industry through TA, publishing own research output for use in teaching, research, and community engagements, promoting the use of archives and special collections to produce new research and lobbying government for VAT considerations and subscribing to national deals. This study provided these local and customised optimisation strategies. The approaches, therefore, become a vital tool for university libraries as a contribution to practice during austerity budgets.

7.4.4 Contribution to teaching

In this study, the scholarship of teaching was not seen as a category on its own. It overlapped with the scholarship of discovery, integration, and application. This thinking informed the policy recommendation 7.3.1.5 above.

7.4.5 Contribution to community engagement

This study contributed to community engagement in several ways. The use of respondent interviews was designed to solicit feedback from the relevant stakeholders on their perception

of how best budgets can be optimised in their institutions. These respondents demonstrated a genuine commitment to finding lasting solutions during data collection. Given these findings, the current study actively engaged the respondents, especially on issues that affect them. Therefore, the proposed optimisation strategies reflect practical realities. The active involvement of librarians, the DVC:Rs, literature reviews and reports from the relevant institutions and SANLiC in synthesising and developing the optimisation strategies provided a sense of ownership and an understanding of their role. This also guided the Section 7.3.2.2 recommendation of this study.

7.5 Suggestions for future research

This study was delimited to SARULs, six (23.01%) universities out of 26 state universities in SA. The main reason for this selection was to compare similar institutions that received funding from CCNY for resource subscriptions, as clearly articulated in Chapter One. It is further suggested that the study include all SA state universities. This would assist in having a comprehensive community of practice database on optimisation strategies as recommended in Section 7.3.2 above.

LIST OF WORKS CITED

- Adom, D., Hussein, E. K. & Agyem, J. (2018). Theoretical and conceptual framework: Mandatory ingredients of a quality research. *International Journal of Scientific Research*, 7(1), 438–441.
- Ajani, Y. A, Tella, A., Salawu, K. Y. & Abdullahi, F. (2022). Perspectives of librarians on awareness and readiness of academic libraries to integrate artificial intelligence for library operations and services in Nigeria. *Internet Reference Services Quarterly*, 26(4), 213-230.
- Akers, K. G. (2020). Report from the Medical Library Association’s InSight Initiative Summit 3: Bridge building: what bridges to build and how. *Journal of the Medical Library Association: JMLA*, 108(2), 321–333.
- Almutairi, A. & Naser, K. (2021). Individuals perception about Introducing the Value Added Tax (VAT) in Kuwait. *Journal of Management Information and Decision Sciences*, 24, 1–13.
- Ames, H., Glenton, C. & Lewin, S. (2019). Purposive sampling in a qualitative evidence synthesis: A worked example from a synthesis on parental perceptions of vaccination communication. *BMC Medical Research Methodology*, 19(1), 26.
- Amonge, A. & Doggett, M. (2017). Application of the TOC thinking process to an emergency department. *Journal of Quality Management Systems, Applied Engineering and Technology Management.*, 2017(3), 1 -21.
- Antwi, S. K. & Hamza, K. (2015). Qualitative and quantitative research paradigms in business research: A philosophical reflection. *European Journal of Business and Management*, 7(3), 217–225.
- Anyira, I. E. (2011). One among the twelve: How library professionals constitute a serious challenge to the provision of library services in the 21st century. *Library Philosophy and Practice*, 537, 1-6.
- Appleton, L. (2018). Training and development for librarians: Why bother? *Library Connect*. Retrieved from <https://www.elsevier.com/connect/training-and-development-for-librarians-why-bother>. Accessed 07 November 2019.
- Archibald, M. M., Ambagtsheer, R. C., Casey, M. G. & Lawless, M. (2019). Using zoom videoconferencing for qualitative data collection: Perceptions and experiences of researchers and participants. *International Journal of Qualitative Methods*, 18, 1-8.

- Asif, M. & Singh, K. K. (2020). Trends, opportunities and scope of libraries during Covid-19 pandemic. *IP Indian Journal of Library Science and Information Technology*, 5(1), 24–27.
- Ataro, G. (2020). Methods, methodological challenges and lesson learned from phenomenological study about OSCE experience: Overview of paradigm-driven qualitative approach in medical education. *Annals of Medicine and Surgery*, 49, 19–23.
- Austin, L. A. & Cheek, L. M. (1979). *Zero-base budgeting: A decision package manual*. New York: AMACOM.
- Babbie, E. (2011). *The basics of social research*. (5th ed.). Wadsworth: Cengage.
- Babbie, E. & Mouton, J. (2001). *The practice of social research*. (South African). Cape Town: Oxford University Press Southern Africa.
- Babbie, E. R. (2017). *The basics of social research*. Boston: Cengage.
- Badenhorst, C. (2007). *Research writing: Breaking the barriers*. Pretoria: Van Schaik.
- Balakrishnan, J., Cheng, C. H. & Trietsch, D. (2008). The Theory of Constraints in academia: Its evolution, influence, controversies, and lessons. *Operations Management Education Reviews*, 2, 97–114.
- Bangani, S. (2018). The history, deployment, and future of Institutional Repositories in public universities in South Africa. *The Journal of Academic Librarianship*, 44(1), 39–51.
- Bank Rakyat Indonesia. (n.d.). *Effective ways to monitor exchange rates for business needs*. Retrieved from <https://developers.bri.co.id/en/news/most-effective-way-monitor-exchange-rates-your-business>. Accessed 02 December 2022.
- Baohua, W., Xiaoyan, M. & Fei, G. (2002). On the characteristics of the digital library and the influence to the work of reader services. *Proceedings of the Third Asian Conference for Information Technology in Agriculture*, 529–532.
- Basias, N. & Pollalis, Y. (2018). Quantitative and qualitative research in business and technology: Justifying a suitable research methodology. *Review of Integrative Business and Economics Research*, 7(1), 15.
- Bauer, J. M., Vargas, A., Sellitto, M. A., Souza, M. C. & Vaccaro, G. L. (2019). The thinking process of the theory of constraints applied to public healthcare. *Business Process Management Journal*, 25(7), 1543–1563.
- Bawack, R. & Nkolo, P. (2018). Open access movement: Reception and acceptance by academic libraries in developing countries. *Library Philosophy and Practice*, 0, 1–24.

- Beach, D. & Kaas, J. G. (2020). The great divides: Incommensurability, the impossibility of mixed-methodology, and what to do about it. *International Studies Review*, 22(2), 214–235.
- Bell, S., J. & Shank, J. (2004). The blended librarian: A blueprint for redefining the teaching and learning role of academic librarians. *College & Research Libraries News*, July/Aug, 372–375.
- Bendoly, E. & Hur, D. (2007). Bipolarity in reactions to operational ‘constraints’: OM bugs under an OB lens. *Journal of Operations Management*, 25(1), 1–13.
- Bergstrom, T. C. (2010). Librarians and the terrible fix: Economics of the Big Deal. *Serials*, 23(2), 77–82.
- Bergstrom, T. C. & Lavaty, R. (2010). *How often do economists self-archive*. Retrieved from https://scholar.google.co.za/scholar?hl=en&as_sdt=0%2C5&q=How+often+do+economists+self-archive&btnG=. Accessed 30 July 2019.
- Bert, M. (n.d.). *Limitations of the Theory of Constraints*. Retrieved from <https://yourbusiness.azcentral.com/limitations-theory-constraints-16352.html>. Accessed 20 January 2019.
- Bertrand¹, C. & Bourdeau¹, L. (2010). *Research interviews by Skype: A new data collection method*. In paper presented at the Proceedings of the 9th European Conference on research methodology for business and management studies, Madrid, Spain.
- Bhatt, A. H. (2015). E-Trials in academic libraries: 101 and beyond. *Journal of Electronic Resources Librarianship*, 27(2), 121–127.
- Bhattacharjee, A. (2012). *Social science research: Principles, methods, and practices*. (2nd ed.). Florida: University of South Florida Scholar Commons.
- Bhattarai, K. (2022) *Microeconomics: learning through games and simulations*. England: University of Hull Business School.
- Bjork, B.-C. (2017). Gold, green and black open access. *Learned Publishing*, 30(2), 173–175.
- Björk, B.-C. & Solomon, D. (2012). Open access versus subscription journals: A comparison of scientific impact. *BMC Medicine*, 10(1), 73–82.
- Blake, M. & Meadows, A. (1984). Journals at risk. *Journal of Librarianship and Information Science*, 16(2), 118–126.
- Blundell, R. (2009). Assessing the temporary VAT cut policy in the UK. *Fiscal Studies*, 30(1), 31–38.

- Bodó, B., Antal, D. & Puha, Z. (2020). Can scholarly pirate libraries bridge the knowledge access gap? An empirical study on the structural conditions of book piracy in global and European academia. *PloS One*, 15(12), e0242509.
- Booth, W. C., Colomb, G. G., Williams, J. M. & Bizup, J. (2016). *The craft of research*. (4th ed.). Chicago: University of Chicago Press.
- Borrego, Á. (2017). Institutional repositories versus ResearchGate: The depositing habits of Spanish researchers. *Learned Publishing*, 30(3), 185–192.
- Borrego, Á., Anglada, L. & Abadal, E. (2021). Transformative agreements: Do they pave the way to open access? *Learned Publishing*, 34(2), 216–232.
- Bosch, S., Albee, B. & Henderson, K. (2018). Death by 1,000 cuts-periodicals price survey 2018: Flat budgets, price increases and a reliance on status journals for tenure and promotion keep familiar pressure on the serials marketplace. *Library Journal*, 143(7), 28–33.
- Bosch, S., Albee, B. & Romaine, S. (2019). Deal or no deal. *Library Journal*, 144(3), 34–39.
- Boshier, R. (2009). Why is the scholarship of teaching and learning such a hard sell? *Higher Education Research & Development*, 28(1), 1–15.
- Bosire, E. (2011). *Access and use of information communication technologies (ICTS) for rural poverty reduction in Uasin Gishu District*. [PhD Thesis]. Moi University.
- Bouhnik, D. & Deshen, M. (2014). WhatsApp goes to school: Mobile instant messaging between teachers and students. *Journal of Information Technology Education Research*, 13, 217–231.
- Boyer, E. L. (1990). *Scholarship reconsidered: Priorities of the professoriate*. New Jersey: Princeton University Press.
- Bradley, E. H., Curry, L. A. & Devers, K. J. (2007). Qualitative data analysis for health services research: Developing taxonomy, themes, and theory. *Health Services Research*, 42(4), 1758–1772.
- Bryman, A. (2016). *Social research methods*. Oxford: Oxford University Press.
- Buchanan, N. (2008). *A history of the University of Natal Libraries, 1910-2003*. [PhD Thesis]. University of KwaZulu-Natal.
- Buchanan, N. & Stilwell, C. (2012). A history of the University of Natal Libraries, 1910–2003. *South African Journal of Library and Information Science= Suid-Afrikaanse Tydskrif Vir Biblioteek-En Inligtingkunde*, 78(1), 1–10.
- Budd, J. (2002). Serials prices and subscriptions in the social sciences. *Journal of Scholarly Publishing*, 33(2), 90–101.

- Burns, R. B. (1997). *Introduction to research methods*. New Jersey: Addison Wesley Longman.
- Burton-Houle, T. (2001). The theory of constraints and its thinking processes. *The Goldratt Institute White Paper*. Retrieved from <https://nzbef.org.nz/wp-content/uploads/2019/05/White-Paper-The-Theory-of-Constraints-and-its-Thinking-Processes.pdf>. Accessed 25 February 2019.
- Busby, L., A. (2017). Empire redefined, Part 3. *The Serials Librarian*, 73(2), 84–88.
- Butler, L.-A., Matthias, L., Simard, M.-A., Mongeon, P. & Haustein, S. (2022). *The oligopoly's shift to open access. How for-profit publishers benefit from article processing charges*. Zenodo. Retrieved from <https://zenodo.org/record/7057144>. Accessed 08 September 2022.
- Camp, W. G. (2001). Formulating and evaluating theoretical frameworks for career and technical education research. *Journal of Vocational Education Research*, 26(1), 27–39.
- Campbell, C., Dér, Á., Geschuhn, K. & Valente, A. (2022). *How are transformative agreements transforming libraries?* International Federation of Library Associations and Institutions World Library & Information Congress (IFLA WLIC, Dublin).
- Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Walker, K. & Bywaters, D. (2020). Purposive sampling: Complex or simple? Research case examples. *Journal of Research in Nursing*, 0(0), 1–10.
- Carr, P. L. & Collins, M. (2009). Acquiring articles through unmediated, user-initiated pay-per-view transactions: An assessment of current practices. *Serials Review*, 35(4), 272–277.
- Casey, M. E. & Savastinuk, L. C. (2007). *Library 2.0: A guide to participatory library service*. Medford: Information Today.
- Casselden, B., Pickard, A., Walton, G. & McLeod, J. (2019). Keeping the doors open in an age of austerity? Qualitative analysis of stakeholder views on volunteers in public libraries. *Journal of Librarianship and Information Science*, 51(4), 869–883.
- Cerrillo, R. A. & Rodriguez, M. G. L. (2015). VAT and Electronic books. *International Business and Economics Research Journal*, 13(8), 1651–1658.
- Chakravorty, S. S. & Atwater, J. B. (1994). How Theory of Constraints can be used to direct preventative maintenance. *Industrial Management*, 36(6), 10.
- Chamberlain, C. & MacAlpine, B. (2008). Pay-per-view article access: A viable replacement for subscriptions? *The Journal of the Serials Community*, 21(1), 30–34.

- Chartered Institute of Public Finance and Accountancy (CIPFA), (2023). *Press release: Library expenditure in Great Britain falls 17%*. Retrieved from <https://www.cipfa.org/about-cipfa/press-office/latest-press-releases/press-release-library-expenditure-in-great-britain-falls-17-percent>. Accessed 18 November 2023.
- Chaudhari, C. V. & Mukhopadhyay, S. K. (2003). Application of theory of constraints in an integrated poultry industry. *International Journal of Production Research*, 41(4), 799–817.
- Chen, X. (2019). High monetary rewards and high academic article outputs: Are China's research publications policy driven? *The Serials Librarian*, 1–11.
- Chisita, C. T. (2017). *Library consortia and Zimbabwe's national development agenda: Librarians' views on constructing a suitable model*. [PhD Thesis]. University of Pretoria.
- Clark, B. R. (1998). *Creating entrepreneurial universities: Organizational pathways of transformation. Issues in higher education*. New York: Elsevier.
- Cohen, L., Manion, L. & Morrison, K. (2011). *Research methods in education*. London: Routledge.
- Cohen, O. (2010). *Ever improve: A guide to managing production the TOC way*. Toc Strategic Solutions.
- Collins, T. (2012). The current budget environment and its impact on libraries, publishers and vendors. *Journal of Library Administration*, 52(1), 18–35.
- Committee of Higher Education Libraries of South Africa (CHELSA), Library and Information Association of South Africa (LIASA), National Council for Library and Information Services (NCLIS) and South Africa National Library and Information Consortium (SANLiC). (2014). *VAT on digital media will contribute to South African Higher Education Libraries losing over 40% of their purchasing power*. (p. 3) [Press release]. Retrieved from <http://liasa.org.za/sites/default/files/documents/2014-03-14%20joint%20press%20statement%20on%20VAT%20%28CHELSA%20LIASA%20NCLIS%20SANLiC%29%20-%20Final.pdf>. Accessed 18 March 2016.
- Conway, C. (2020). *Collecting, analyzing and reporting data: An Oxford handbook of qualitative research in American music education*. (Vol. 2). Oxford: Oxford University Press.
- Cooper, R. & Kaplan, R. S. (1998). The promise and peril of integrated cost systems. *Harvard Business Review*, 76(4), 109–119.

- Corbyn, Z. (2009). Journal subscriptions at risk as weak pound hits library budgets: Research-intensive institutions appeal for “exchange rate funding”. *Times Higher Education (THE)*. Retrieved from <https://www.timeshighereducation.com/news/journal-subscriptions-at-risk-as-weak-p>. Accessed 27 March 2019.
- Cowgill, A., Beam, J. & Wess, L. (2001). Implementing an information commons in a university library. *The Journal of Academic Librarianship*, 27(6), 432–439.
- Cox, J. & Schleier, J. (2010). *Theory of Constraints handbook*. New York: McGraw-Hill.
- Crawford, G. A. (2015). The academic library and student retention and graduation: An exploratory study. *Portal: Libraries and the Academy*, 15(1), 41–57.
- Creswell, J. W. (1994). *Research design: Qualitative and quantitative approaches*. California: Sage.
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches*. (3rd ed.). Los Angeles: Sage.
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches*. (4th ed.). Los Angeles: Sage.
- Creswell, J. W. & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches*. (5th ed.). Los Angeles: Sage.
- Creswell, J. W. & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches*. (4th ed.). Los Angeles: Sage.
- Crossman, A. (2020). *What you need to understand about purposive sampling*. Retrieved from <https://www.thoughtco.com/purposive-sampling-3026727>. Accessed 26 October 2020.
- Crowe, K. (2019). *Why does it cost millions to access publicly funded research papers? Blame the paywall | CBC News*. Retrieved from <https://www.cbc.ca/news/health/research-public-funding-academic-journal-subscriptions-elsevier-librarians-university-of-california-1.5049597>. Accessed 13 May 2019.
- Crowe, S., Cresswell, K., Robertson, A., Huby, G., Avery, A. & Sheikh, A. (2011). The case study approach. *BMC Medical Research Methodology*, 11(1), 100–108.
- Cruzes, D. S. & Dyba, T. (2011). Recommended steps for thematic synthesis in software engineering. *2011 International Symposium on Empirical Software Engineering and Measurement*, 275–284.
- Darch, C. (1998). The shrinking public domain and the unsustainable library. *Electronic Library: Gateway to Information*, 2(6), 1–14.

- Davis, P. (2012). *Libraries receiving a shrinking piece of the university pie*. Retrieved from <https://scholarlykitchen.sspnet.org/2012/02/15/a-shrinking-piece-of-the-university-pie/>. Accessed 06 December 2019.
- Davis, P. (2014). *Libraries receive shrinking share of university expenditures*. Retrieved from <https://scholarlykitchen.sspnet.org/2014/07/22/libraries-receive-shrinking-share/>. Accessed 03 December 2019.
- De Fina, A. (2021). Doing narrative analysis from a narratives-as-practices perspective. *Narrative Inquiry*, 31(1), 49–71.
- Deakin, H. & Wakefield, K. (2014). Skype interviewing: Reflections of two PhD researchers. *Qualitative Research*, 14(5), 603–616.
- Dean, C. D., Fazelian, J., Hoover, J., Schmitz, L., Nelson, T., Owens, D. & Scales, L. (2020). *University libraries review*. University of Missouri-St. Louis. Retrieved from <https://irl.umsl.edu/cgi/viewcontent.cgi?article=1043&context=libpub>. Accessed 16 October 2022.
- DeFranzo, S. (2011). *Difference between qualitative and quantitative research*. Retrieved from <https://www.snapsurveys.com/blog/qualitative-vs-quantitative-research/>. Accessed 03 February 2019.
- Department of Higher Education and Training. (2019). *Report on the evaluation of the 2017 universities' research output*. Department of higher education and training. Retrieved from <https://www.dhet.gov.za/Policy%20and%20Development%20Support/2017%20Research%20Outputs%20report.pdf>. Accessed 05 February 2023.
- Department of Higher Education and Training. (2023). *University research support and policy development*. Retrieved from <https://www.dhet.gov.za/SitePages/University%20Research%20Support%20and%20Policy%20Development.aspx>. Accessed 06 February 2023.
- Dettmer, H. W. (1997). *Goldratt's theory of constraints: A systems approach to continuous improvement*. Milwaukee: ASQ Quality Press.
- Dhanabalan, T., Subha, K., Shanthi, R. & Sathish, A. (2018). Factors influencing consumers' car purchasing decision in Indian automobile industry. *International Journal of Mechanical Engineering and Technology*, 9(10), 53–63.
- Dossett, J. C. & Williams, R. (2004). *Budgets and financial management in special libraries*. Retrieved from <http://faculty.libsci.sc.edu/bob/class/clis724/S>

pecialLibrariesHandbook/Budgets%20and%20Financial%20Management.htm.

Accessed 13 April 2016.

Dracke, D. (2022). *The price effects of reduced VAT on book: Evidence from the Swedish consumer market*. [Masters Thesis]. Uppsala University.

Du Plooy-Cilliers, F., Davis, C. & Bezuidenhout, R.-M. (2014). *Research matters*. Claremont: Juta.

EBSCO. (2018). *EBSCO serials price projection report*. Retrieved from https://www.ebscohost.com/promoMaterials/EBSCO_2018_Serials_Price_Projections.pdf?_ga=2.257194699.1712987302.1547218562-1180886112.1513152106. Accessed 25 January 2019.

Eden, Y. & Ronen, B. (2007). *Approximately right, not precisely wrong: Cost accounting, pricing and decision making*. Great Barrington: North River Press.

Eichhorn, M. P., Baker, K. & Griffiths, M. (2019). Steps towards decolonising biogeography. *Frontiers of Biogeography*, 12(1), 1–7.

Eidelwein, F., Piran, F. A. S., Lacerda, D. P., Dresch, A. & Rodrigues, L. H. (2018). Exploratory analysis of modularization strategy based on the theory of constraints thinking process. *Global Journal of Flexible Systems Management*, 19(2), 111–122.

Eisen, M. (2003). Publish and be praised. *The Guardian*, 9. Retrieved from <https://www.theguardian.com/education/2003/oct/09/research.highereducation>. Accessed 31 July 2019.

Eisner, E. W. (1991). *The enlightened eye, qualitative inquiry and the enhancement of educational practice*. New York: Macmillan.

Elliott, D., Husbands, S., Hamdy, F. C., Holmberg, L. & Donovan, J. L. (2017). Understanding and improving recruitment to randomised controlled trials: Qualitative research approaches. *European Urology*, 72(5), 789–798.

Emanuel, M. (2013). Using screencasting to promote database trials and library resources. *Journal of Electronic Resources Librarianship*, 25(4), 277–282.

Eve, M. P. (2022). Lessons from the Library: Extreme minimalist scaling at pirate ebook platforms. Retrieved from www.digitalhumanities.org/dhq/vol/16/2/000587/000587.html. Accessed 19 October 2022.

ezTalks. (2017). *Skype vs WhatsApp: 2017 comparison*. Retrieved from <https://www.eztalks.com/video-conference/skype-vs-whatsapp-which-is-better.html>. Accessed 21 July 2018.

- Farkas, M. G. (2005). *Web/Library 2.0 backlash / information wants to be free*. Retrieved from <https://meredith.wolfwater.com/wordpress/2005/12/01/weblibrary-20-backlash/>. Accessed 16 April 2018.
- Fay, R. (2017). An exploration into the information searching behaviours of young barristers in Ireland. *Legal Information Management*, 17(2), 119–130.
- Feilzer, M. Y. (2010). Doing mixed methods research pragmatically: Implications for the rediscovery of pragmatism as a research paradigm. *Journal of Mixed Methods Research*, 4(1), 6–16.
- Fincher, R.-M. E. & Work, J. A. (2006). Perspectives on the scholarship of teaching. *Medical Education-Oxford*, 40(4), 293–295.
- Fitchett, T., Hambleton, J., Hazelton, P. & Klinefelter, A. (2011). Law library budgets in hard times. *Law Library Journal*, 103, 91-93.
- Fleming, R. (2015). Looking at the library collections budget: Budget as story and interrogating narrative frames. *Serials Review*, 41(3), 173–175.
- Flesch, J. (1997). Which library is mine? The university library and the independent scholar. *Australian Academic and Research Libraries*, 28(3), 181–187.
- Flint, M. A. (2022). More than human methodologies in qualitative research: Listening to the leafblower. *Qualitative Research*, 22(4), 521–541.
- Foley, B. (2018). *Purposive Sampling 101*. Retrieved from <https://www.surveygizmo.com/resources/blog/purposive-sampling-101>. Accessed 28 August 2020.
- Fomunyan, K. (2020). Pure and applied research as the epicenter of research in engineering education. *International Journal of Engineering Research and Technology*, 13(9), 2402–2408.
- Fought, R. L. (2014). Breaking inertia: Increasing access to journals during a period of declining budgets: a case study. *Journal of the Medical Library Association: JMLA*, 102(3), 192.
- Frazier, K. (2005). What’s the big deal? *The Serials Librarian*, 48(1–2), 49–59.
- Frempong-Kore, A. (2020a). Effects of donations on the collection development of private academic libraries in Ghana: A case study of Central University. *Library Philosophy and Practice*, 1–17.
- Frempong-Kore, A. (2020b). The role of donation on the collection development In Ghana Communication Technology University Library. *International Journal of Arts and Social Science*, 3(6), 110–118.

- Friese, S. (2019). *Qualitative data analysis with ATLAS.ti* (3rd ed.). Los Angeles: Sage.
- Fitzgerald, S. R., Hutton, S., Reznik-Zellen, R., Barlow, C and Oldham, W (2023). Decision making by and for academic libraries during COVID-19. *Portal: Libraries and the academy*, 23(1), 45-65.
- García-Crespo, Á., Gómez-Berbís, J. M., Colomo-Palacios, R. & García-Sánchez, F. (2011). Digital libraries and Web 3.0. The CallimachusDL approach. *Computers in Human Behavior*, 27(4), 1424–1430.
- Gay, L. & Airasian, P. (1996). *Educational research competencies for analysis and application*. New Jersey: Prentice Hall.
- Germano, M. (2011). The library value deficit. *The Bottom Line*, 24(2), 100–106.
- Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *The Qualitative Report*, 8(4), 597–606.
- Goldratt, E. (1994). *It's not luck*. Aldershot: Gower.
- Goldratt, E. (2003). *Production the TOC way*. New York: North River Press.
- Goldratt, E. (2010). *Introduction to TOC-my perspective*. New York: McGraw Hill Professional.
- Goldratt, E., M. (1990). *What is this thing called theory of constraints and how should it be implemented?* New York: North River Press.
- Goldratt, E., M. (1999). *Theory of constraints*. Great Barrington: North River Press.
- Goldratt, E. M. (2009). Standing on the shoulders of giants: Production concepts versus production applications. The Hitachi tool engineering example. *Gestao and Producao*, 16(3), 333–343.
- Goldratt, E. M. & Cox, J. (1992). *The Goal*. (2nd. ed.). New York: North River Press.
- Gonzalez, B. (2011). *Resource allocation strategies In doctoral/research university (extensive) libraries*. [PhD Thesis]. The George Washington University.
- Grant, C. & Osanloo, A. (2014). Understanding, selecting and integrating a theoretical framework in dissertation research: Creating the blueprint for “house”. *Administrative Issues Journal*, 4(2), 4.
- Gray, E. & Czerniewicz, L. (2018). *Access to learning resources in post-apartheid South Africa*. Cambridge: The MIT Press.
- Green, T. (2017). We've failed: Pirate black open access is trumping green and gold and we must change our approach. *Learned Publishing*, 30(4), 325–329.

- Green, T. (2019). Is open access affordable? Why current models do not work and why we need internet-era transformation of scholarly communications. *Learned Publishing*, 32(1), 13–25.
- Griffiths, D. (2019). # FeesMustFall and the decolonised university in South Africa: Tensions and opportunities in a globalising world. *International Journal of Educational Research*, 94, 143–149.
- Guarria, C. I. & Wang, Z. (2011). The economic crisis and its effect on libraries. *New Library World*, 112(5/6), 199–214.
- Hammersley, M. (2013). *What is qualitative research?* London: Bloomsbury.
- Hanna, P. (2012). Using internet technologies (such as Skype) as a research medium: A research note. *Qualitative Research*, 12(2), 239–242.
- Hansen, S. C. (2011). A theoretical analysis of the impact of adopting rolling budgets, activity-based budgeting and beyond budgeting. *European Accounting Review*, 20(2), 289–319.
- Harper, R. & Corral, S. (2011). Effects of the economic downturn on academic libraries in the UK: positions and projections in mid-2009. *New Review of Academic Librarianship*, 17(1), 96–128.
- Harris, S. & Barrett, D. (2019). *Justice department investigates Sci-Hub founder on suspicion of working for Russian intelligence*. Washington Post. Retrieved from file:///C:/Users/A0015924/Downloads/JusticeDepartmentinvestigatesSci-HubfounderonSuspicionofworkingforRussianintelligence-TheWashingtonPost-1.pdf. Accessed 19 October 2022.
- Harter, S. P. (1996). What is a digital Library? Definitions, content and issues. *International Conference on Digital Libraries and Information Services for the 21st Century*, 8–17.
- Harwood, P. & Prior, A. (2008). Testing usage based e-journal pricing. *Learned Publishing*, 21(2), 133–139.
- Hayashi Jr, P., Abib, G. & Hoppen, N. (2019). Validity in qualitative research: A processual approach. *The Qualitative Report*, 24(1), 98–112.
- Hazlett, M. A., Henderson, K. M., Zeitzer, I. F. & Drew, J. A. (2020). The geography of publishing in the Anthropocene. *Conservation Science and Practice*, 2(10), 1–11.
- Head, A., Ellis-Caird, H., Rhodes, L. & Mengoni, S. (2021). “It was really good, she sort of took some words what happened, like what I would say”: Adapting dyadic interview techniques to capture the stories of marginalised voices in research. Retrieved from <https://uhra.herts.ac.uk/handle/2299/24566>. Accessed 13 October 2022.

- Hedding, D. W. (2019). Payouts push professors towards predatory journals. *Nature*, 565(7737), 267–268.
- Henning, E., Van Rensburg, W. & Smit, B. (2004). *Finding your way in qualitative research*. Pretoria: Van Schaik.
- Herb, U. (2018). Open access and symbolic gift giving. *Open Divide: Critical Studies on Open Access*, 69–81.
- Hernandez-Carrion, J. R. (2022). End of libraries/renaissance in the “peer-to-peer sharing economy” revolution age? Librarians of the future educating for a sustainable world. *Digital Library Perspectives*, 38(4), 542–552.
- Hernández-Pérez, O., Vilariño, F. & Domènech, M. (2022). Public libraries engaging communities through technology and innovation: Insights from the library living lab. *Public Library Quarterly*, 41(1), 17–42.
- Hoeve, C. D. (2019). Resource management in a time of fiscal scarcity: Combining qualitative and quantitative assessment for journal package cancellations. *The Serials Librarian*, 75(1–4), 42–50.
- Holderman, S. (2015). Formalizing the academic library subscription request process: An opportunity to cultivate relationships. *College and Research Libraries News*, 76(10), 547–549.
- Hoon, P. E. (2003). Who woke the sleeping: Giant? Libraries, copyrights, and the digital age. *Change: The Magazine of Higher Learning*, 35(6), 28–33.
- Hoover, J., Shirkey, C. & Barricella, L. S. (2020). Exploring sustainability of affordability initiatives: A library case study. *Reference Services Review*, 48(3), 447–456.
- Hope, J. & Fraser, R. (2003). *Beyond budgeting: How managers can break free from the annual performance trap*. Boston: Harvard Business Press.
- Horbach, S. P. J. M. & Halfman, W. (2018). The changing forms and expectations of peer review. *Research Integrity and Peer Review*, 3(1), 8.
- Hoskins, R. (2009). *The effect of the crisis in scholarly communication on university libraries in South Africa*. [PhD Thesis]. University of KwaZulu-Natal.
- Hoskins, R. (2013). The influence of open access on journal cancellations in university libraries in South Africa. *The Electronic Library*, 31(5), 574–592.
- Hoskins, R. & Stilwell, C. (2010). Journal cancellations in university libraries in South Africa. *South African Journal of Libraries and Information Science*, 76(1), 24–35.

- Hoskins, R. & Stilwell, C. (2011). Library funding and journal cancellations in South African university libraries. *South African Journal of Libraries and Information Science*, 77(1), 51–63.
- Hunter, K. & Bruning, R. (2010). The global economic crisis: What libraries and publishers can do and are doing. *The Serials Librarian*, 59(2), 147–158.
- Hussaini, A. (2020). Challenges and opportunities in the management of collection development policy in libraries. *MiddleBelt Journal of Library and Information Science*, 18, 164-176.
- Idakwo, I. S. (2019). Theft and mutilation on the use of library resources in Nigerian academic libraries. *Library Philosophy and Practice*, August, 1–6.
- Idowu, M. A. & Obaretin, O. (2022). Issue of income inequality in Nigeria: The role of Indirect Taxes. *African Development Finance Journal*, 2(2), Article 2.
- Iheme, P., Ukpabi, R. K., Ejiako, C. C. & Ogueri, E. (2021). Effects of book theft and mutilation on resources and services of university libraries in Imo State, Nigeria. *The Information Technologist*, 18(2), Article 2.
- Ikeziri, L. M., Souza, F. B. de, Gupta, M. C. & de Camargo Fiorini, P. (2019). Theory of Constraints: Review and Bibliometric Analysis. *International Journal of Production Research*, 57(15–16), 5068–5102.
- Imenda, S. (2014). Is there a conceptual difference between conceptual and theoretical frameworks? *Journal of Social Sciences*, 38(2), 185–195.
- Inman, R. A., Sale, M. L. & Green, K. W. Jr. (2009). Analysis of the relationships among TOC use, TOC outcomes, and organizational performance. *International Journal of Operations and Production Management*, 29(4), 341–356.
- Investopedia. (n.d.). *Austerity*. Investopedia. Retrieved from <https://www.investopedia.com/terms/a/austerity.asp>. Accessed 20 July 2018.
- Jarvis, C. & Gregory, J. M. (2016). Get it? Got it. good!: utilizing get it now article delivery service at a health sciences library. *Journal of Electronic Resources Librarianship*, 28(2), 93–100.
- Johnson, J. L., Adkins, D. & Chauvin, S. (2020). A review of the quality indicators of rigor in qualitative research. *American Journal of Pharmaceutical Education*, 84(1), 138–146.
- Johnson, R., Watkinson, A. & Mabe, M. (2018). *The STM report*. (5th edition). International Association of Scientific, Technical and Medical Publishers. Retrieved from https://www.stm-assoc.org/2018_10_04_STM_Report_2018.pdf. Accessed 26 April 2019.

- Jonker, J. & Pennink, B. (2010). *The essence of research methodology: A concise guide for master and PhD students in management science*. Heidelberg: Springer Science & Business Media.
- Jørgensen, F. & Hanssen, T.-E. S. (2018). Research incentives and research output. *Higher Education*, 76(6), 1029–1049.
- Josselson, R. & Hammack, P. L. (2021). *Essentials of narrative analysis*. Washington, DC: American Psychological Association.
- Jump, P. (2015). Merger is “bad news for universities”, say librarians. *Times Higher Education (THE)*, January 22. Retrieved from <https://www.timeshighereducation.com/news/merger-is-bad-news-for-universities-say>. Accessed 27 March 2019.
- Jung, J. (2014). Research productivity by career stage among Korean academics. *Tertiary Education and Management*, 20(2), 85–105.
- Kachel, D. (2017). Advocating for the school library budget. *Teacher Librarian*, 45(2), 48–63.
- Kagan, J. (2018). *Zero-based budgeting*. [Investopia]. Retrieved from <https://www.investopedia.com/terms/z/zbb.asp>. Accessed 11 March 2019.
- Karlstrom, N. (2019). *Setting a trend? Norway and Elsevier enter into a two-year transformation pilot agreement*. Retrieved from <https://www.openaire.eu/blogs/unit-and-elsevier-agreement>. Accessed 19 September 2019.
- Kay, E. (2022). What is research? *Evidence-Based Dentistry*, 23(3), 88–88.
- Kelly, S. (2010). *Qualitative interviewing techniques and styles in the Sage handbook of qualitative methods in health research*. California: Sage.
- Kidd, T. (2010). The view from the U.K.: The economic crisis and serials acquisitions on an offshore Island. *The Serials Librarian*, 59(3–4), 384–393.
- Kim, S., Mabin, V. J. & Davies, J. (2008). The theory of constraints thinking processes: Retrospect and prospect. *International Journal of Operations and Production Management*, 28(2), 155–184.
- Klain Gabbay, L. & Shoham, S. (2017). The role of academic libraries in research and teaching. *Journal of Librarianship and Information Science*, 49(4), 359–485.
- Knaggs, C. D. (2013). *Theory of constraints: Empirical test of applicability and constructs beyond the manufacturing sector*. [PhD Thesis]. Trident University International.
- Kohli, A. S. & Gupta, M. (2010). Improving operations strategy: Application of TOC principles in a small business. *Journal of Business and Economics Research*, 8(4), 37.

- Kolh, D. F. (2006). Corrigendum to “From the editor... Dr. Jekyll and Mr. Hyde or how reasonable ideas can turn out badly”. *The Journal of Academic Librarianship*, 32(6), 347–348.
- Kopec, K. (2020). Reduced value added Tax (VAT) rate on books as a tool of direct public funding in the cultural sector. *Sustainability*, 12(14), 5590.
- Kothari, C. R. (2004). *Research methodology: Methods and techniques*. New Delhi: New Age International.
- Krouwel, M., Jolly, K. & Greenfield, S. (2019). Comparing Skype (video calling) and in-person qualitative interview modes in a study of people with irritable bowel syndrome—an exploratory comparative analysis. *BMC Medical Research Methodology*, 19(1), 1–9.
- Kumar, R. (2014). *Research methodology: A step-by-step guide for beginners*. (4th ed.). London: Sage.
- Kumar, R. (2019). *Research methodology: A step-by-step guide for beginners*. London: Sage.
- Kwanya, T., Stilwell, C. & Underwood, P. G. (2011). Library 2.0 versus other library service models: A critical analysis. *Journal of Librarianship and Information Science*, 44(3), 145–162.
- Lachenmayer, D. (2019). Let it flow: The monopolization of academic content providers and how It threatens the democratization of information. *The Serials Librarian*, 75(1–4), 70–80.
- Lawson, E. & Price, C. (2003). The psychology of change management. *McKinsey Quarterly*, 30.
- Leach, R. G. & Tribble, J. E. (1993). Electronic document delivery: New options for libraries. *The Journal of Academic Librarianship*, 18(6), 359–364.
- Leeper, Thomas J. (2016). *Elsevier purchase SSRN: social scientists face questions over whether centralised repository is in their interests*. Impact of Social Sciences Blog. Retrieved from <https://eprints.lse.ac.uk/66734/>. Accessed 11 August 2023.
- Lener, E. & Gilmore, T. (2019). *Thirty days and counting: Conducting effective product trials for library resources*. Charleston Library Conference. Retrieved from <https://docs.lib.purdue.edu/charleston/2018/management/3>. Accessed 20 November 2022.
- Lieber, Z. & Ronen, B. (2010). Focused management in a court system: Doing more with the existing resources. *Human Systems Management*, 29(4), 265–277.

- Lin, P.-C., Lee, W.-Y. & Lee, M.-Y. (2009). Exploring problems and undesired effects in the construction development process: The case of a small- to medium-sized developer in Taiwan. *Journal of Construction Engineering and Management*, 135(7), 560–569.
- Linn, M. (2007). Budget systems used in allocating resources to libraries. *The Bottom Line*, 20(1), 20–29.
- Loomba, R., S. (2022). The sum of its parts: The importance of methodology on presented data. *African Annals of Thoracic and Cardiovascular Surgery*, 14(3), 23.
- Lozynska, O. & Chaikovskiy, V. (2023). Using the analytic hierarchy process for budget and cost control in IT projects. *IEEE 18th International Conference on Computer Science and Information Technologies (CSIT)* 1-4.
- Lucky, T. A. & Matthew, I. I. (2021). Information on Budgeting and Budgetary Allocation in Federal University Library, Lafia, Nasarawa State—Nigeria. *Sumerianz Journal of Social Science*, 41, 1–11.
- Luft, J. A., Jeong, S., Idsardi, R. & Gardner, G. (2022). Literature reviews, theoretical frameworks, and conceptual frameworks: an introduction for new biology education researchers. *CBE Life Sciences Education*, 21(3), 1-10.
- Mabin, V. (2015). *Goldratt's "Theory of Constraints" thinking processes: A systems methodology linking soft with hard*. Retrieved from <https://pdfs.semanticscholar.org/cc20/18bf65be1423ce284e2289db36a625692a01.pdf>. Accessed 16 February 2019.
- Mabin, V. J. & Balderstone, S. J. (2003). The performance of the theory of constraints methodology: Analysis and discussion of successful TOC applications. *International Journal of Operations and Production Management*, 23(6), 568–595.
- Mabin, V. J. & Balderstone, S. J. (2020). *The world of the theory of constraints: A review of the international literature*. Florida: CRC Press.
- Mack, L. (2010). The philosophical underpinnings of educational research. *Polyglossia*, 19, 5–11.
- Marshall, C. & Rossman, G. B. (2016). *Designing qualitative research*. (6th ed.). California: Sage.
- Martinez, M. C. (2021). *The science of Higher Education: State Higher Education policy and the laws of scale*. Virginia: Stylus Publishing.
- Martín-Martín, A., Costas, R., Van Leeuwen, T. & López-Cózar, E. D. (2018). Evidence of open access of scientific publications in Google Scholar: A large-scale analysis. *Journal of Informetrics*, 12(3), 819–841.

- Mascagni, G., Dom, R., Santoro, F. & Mukama, D. (2022). The VAT in practice: Equity, enforcement, and complexity. *International Tax and Public Finance*, 29(5), 1–39.
- Matthews, D. (2019a). *Big universities pay more as Germany strikes Springer Nature deal*. Retrieved from <https://www.timeshighereducation.com/news/big-universities-pay-more-germany-strikes-springer-nature-deal>. Accessed 23 August 2019.
- Matthews, D. (2019b). *Germany signs open access publishing deal with Wiley*. Retrieved from <https://www.timeshighereducation.com/news/germany-signs-open-access-publishing-deal-wiley>. Accessed 23 August 2019.
- Matthews, D. (2019c). *Publishers ‘taking funders for a ride’ with mirror journals*. Retrieved from <https://www.timeshighereducation.com/news/publishers-taking-funders-ride-mirror-journals>. Accessed 23 August 2019.
- Mavetera, N. (2012). *Towards an ontology-driven software development approach: An unended quest*. [PhD Thesis]. University of Pretoria.
- Maxwell, J. A. (2013). *Qualitative research design: An interactive approach*. (3rd. ed.). California: Sage.
- McCabe, M. J. (1999). *The impact of publisher mergers on journal prices: An update*. Association of Research Libraries: A Bimonthly Report 207, 1–5.
- McCabe, M. J. (2001). The impact of publisher mergers on journal prices: Theory and evidence. *The Serials Librarian*, 40(1–2), 157–166.
- McCarthy, M., Christian, M. & Slade, D. (2019). Discourse analysis. In *An introduction to applied linguistics*. (pp. 55–71). Oxfordshire: Routledge.
- McCombes, S. (2019). *How to write a research methodology in four steps*. Retrieved from <https://www.scribbr.com/dissertation/methodology>. Accessed 10 August 2020.
- McGrath, C., Palmgren, P. J. & Liljedahl, M. (2019). Twelve tips for conducting qualitative research interviews. *Medical Teacher*, 41(9), 1002–1006.
- McGrath, M. (2010). Interlending and document supply: A review of the recent literature: 72. *Interlending and Document Supply*, 38(4), 226–230.
- McGrath, M. (2012). Fighting back against the big deals: A success story from the UK. *Interlending and Document Supply*, 40(4), 178–186.
- McLean, J. & Ladd, K. (2021). The buyback dilemma: How we developed a principle-based, data-driven approach to unbundling big deals. *The Serials Librarian*, 81(3–4), 295–311.
- Mehta, D. & Wang, X. (2020). COVID-19 and digital library services—a case study of a university library. *Digital Library Perspectives*, 36(4), 351–363.

- Merriam, S. B. (1998). *Qualitative research and case study applications in education*. (2nd ed). San Francisco: Jossey-Bass Publishers.
- Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation*. San Francisco: Jossey-Bass.
- Merriam, S. B. & Tisdell, E. J. (2015). *Qualitative research: A guide to design and implementation*. San Francisco: John Wiley & Sons.
- Merriam Webster dictionary. (n.d.). Austerity. In *Merriam Webster dictionary*. Merriam Webster dictionary. Retrieved from <https://www.merriam-webster.com/dictionary/austerity>. Accessed 20 July, 2018.
- Miles, M. B. & Huberman, A. M. (1984). *Qualitative data analysis: A sourcebook of new methods*. Beverly Hills: Sage.
- Miles, M. B. & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. California: Sage.
- Miller-Francisco, E. (2003). Managing electronic resources in a time of shrinking budgets. *Library Collections, Acquisitions, and Technical Services*, 27(4), 507–512.
- Mills, K. J., Lawlor, J. A., Neal, J. W., Neal, Z. P. & McAlindon, K. (2020). What is research? Educators' conceptions and alignment with United States federal policies. *Evidence and Policy*, 16(3), 337–358.
- Mishra, S. B. & Alok, S. (2022). *Handbook of research methodology: A compendium for scholars and researchers*. New Delhi: Educreation Publishing.
- Mishra, S. & Palo, S. (2014). Applying theory of constraints to the Indian administrative services. *Management and Labour Studies*, 39(2), 187–207.
- Mojapelo, M., Modiba, M. & Saurombe, N. (2023). Applying Batho Pele principles in South African public archives—Do public programming initiatives count? *Information Development*, 39(2), 357–375.
- Mongeon, P., Siler, K., Archambault, A., Sugimoto, C. & Larivière, V. (2021). Collection development in the era of big deals. *College and Research Libraries*, 82(2), 219.
- Moscovitch, P. (2016). *Dropping loonie squeezes library budgets as costs for materials climb*. The Globe and Mail (Online). Retrieved from <https://www.proquest.com/docview/2383575193/citation/765BD4D69E134F52PQ/1>. Accessed 08 October 2022.
- Mpofu, B. & Ndlovu-Gatsheni, S. (2020). *The dynamics of changing higher education in the Global South*. Newcastle: Cambridge Scholars Publishing.

- Mubofu, C. & Chaula, S. (2020) Information resource sharing in academic libraries: Tanzania context. *Library philosophy and practice*, 4685-4694.
- Muccie, M. R. (2015). Getting the Word Out: Academic Libraries as Scholarly Publishers. *Libraries and the Academy*, 15(4), 769–770.
- Murphy, J. A. & Buckley, C. E. (2018). Document Delivery as a Supplement or Replacement for Serial Subscriptions. *Serials Review*, 44(3), 241–246.
- Murphy, K. (2016). Should all research papers be free? *The New York Times*, 12.
- Myers, M. D. (1997). Qualitative research in information systems. *Management Information Systems Quarterly*, 21(2), 241–242.
- Naor, M., Bernardes, E. S. & Coman, A. (2013). Theory of constraints: Is it a theory and a good one? *International Journal of Production Research*, 51(2), 542–554.
- Napitupulu, S., Napitupulu, F. D. & Kisno. (2019). *Research methodology in linguistics and education*. Yogyakarta: Deepublish.
- Nelson, L. K. (2020). Computational grounded theory: A methodological framework. *Sociological Methods & Research*, 49(1), 3–42.
- Neuman, W. L. (2014). *Social research methods: Qualitative and quantitative approaches*. (7th, international ed.). Harlow: Pearson.
- Ngulube, P., Mathipa, E. R. & Gumbo, M. T. (2015). *Theoretical and conceptual frameworks in the social and management sciences*. In Mathipa, E. R. & Gumbo, M. T. (eds). *Addressing research challenges: Making headway in developing researchers*. Noordwyk: Mosala-Masedi Publishers and Booksellers.
- Nicholas, D., Rowlands, I., Jubb, M. & Jamali, H. R. (2010). The impact of the economic downturn on libraries: With special reference to university libraries. *The Journal of Academic Librarianship*, 36(5), 376–382.
- Nicholson, C. F., Kopainsky, B., Stephens, E. C., Parsons, D., Jones, A. D., Garrett, J. & Phillips, E. L. (2020). Conceptual frameworks linking agriculture and food security. *Nature Food*, 1 (9), 541-551.
- Noreen, E., Smith, D. & Mackey, J. T. (1995). *Theory of Constraints and Its Implications for Management Accounting: A Report on the Actual Implementation of The Theory of Constraints*. North River Press, Incorporated.
- Noriaki Aoki, M. D., FJSIM, C., Sachiko Ohta, M. D. & Mariko Oishi, M. D. (2008). An introduction to the theory of constraint and how it can be applied to medical management. *Physician Executive*, 34(2), 52.

- Northern Ireland Assembly, Research and Library Services. (2010). *Methods of budgeting* [Research paper 06/10]. Retrieved from <http://www.focusintl.com/RBM150-0610.pdf>. Accessed 03 November 2019.
- Nosakhere, A. S. & Abdelwahid, M. A. (2014). *Open access resources for academic libraries in Africa: Selection and evaluation*. Retrieved from https://scholar.google.co.za/scholar?hl=en&as_sdt=0%2C5&q=Open+Access+Resources+for+Academic+Libraries+in+Africa%3A+Selection+and+Evaluation&btnG= Accessed 17 June 2020.
- Nwannebuike, D. U. S., Ike, U. J. & Onuka, D. O. I. (2016). External debt and economic growth: The Nigeria experience. *European Journal of Accounting Auditing and Finance Research*, 4(2), 33–48.
- Obadan, M. (2006). Overview of exchange rate management in Nigeria. *Bullion*, 30(3). Retrieved from <https://dc.cbn.gov.ng/bullion/vol30/iss3/1>. Accessed 02 December 2022.
- Obi, B. B. & Okwu, E. (2014). Institutional repository: A paradigm shift in library's collection management and information sharing in higher institutions. *Brazilian Research Journal of Humanities, Social and Management Sciences*, 7(2), 43–51.
- Ogunjimi, T. T., Bello, M. A. & Olaniyi, O. O. (2018). Institutional budget and impact of internally generated revenue on funding of academic library in a developing economy. *Library Philosophy and Practice*, 1–23.
- Oishi, S., Kushlev, K. & Schimmack, U. (2018). Progressive taxation, income inequality, and happiness. *American Psychologist*, 73(2), 157–168.
- Okiy, R. B. (2005). Funding Nigerian libraries in the 21st century: Will funding from alternative sources suffice? *The Bottom Line*, 18(2), 71–77.
- Opendakker, R. (2006). Advantages and disadvantages of four interview techniques in qualitative research. *Forum Qualitative Social Research*, 7(4), 1–11.
- Ovadia, S. (2014). ResearchGate and Academia.edu: Academic social networks. *Behavioral and Social Sciences Librarian*, 33(3), 165–169.
- Owen, G., Fletcher, M. & Lester, S. (2006). *Size Matters: Economies of scale in schools and colleges. Research Report*. London: Learning and Skills Development Agency. Retrieved from <https://files.eric.ed.gov/fulltext/ED502039.pdf>. Accessed 01 December 2022.

- Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N. & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health*, 42(5), 533–544.
- Pass, S. & Ronen, B. (2003). Management by the market constraint in the hi-tech industry. *International Journal of Production Research*, 41(4), 713–724.
- Patton, M. Q. (2007). Sampling, qualitative (purposive). In *The Blackwell encyclopedia of sociology*. Georgia: American Cancer Society.
- Pedersen, K. (2018). E-government transformations: Challenges and strategies. *Transforming Government: People, Process and Policy*, 12(1), 84–109.
- Pells, R. (2019). *Plan S: how important is open access publishing?* Retrieved from <https://www.timeshighereducation.com/features/plan-s-how-important-open-access-publishing>. Accessed 23 August 2019.
- Pendell, K. D. (2018). Behind the wall: An exploration of public access to research articles in Social Work journals. *Advances in Social Work*, 18(4), 1041–1052.
- Peters, J. (2018). Shrinking horizons or pushing boundaries? *Insights*, 31(0). Retrieved from <http://insights.uksg.org/articles/10.1629/uksg.397/>. 21 September 2018.
- Pettorelli, N., Barlow, J., Nuñez, M. A., Rader, R., Stephens, P. A., Pinfield, T. & Newton, E. (2021). How international journals can support ecology from the Global South. *Journal of Applied Ecology*, 58(1), 4–8.
- Pham, L. (2018). *A review of key paradigms: Positivism, interpretivism and critical inquiry*. Retrieved from <http://rgdoi.net/10.13140/RG.2.2.13995.54569>. Accessed 25 August 2020.
- Piotrowska-Piatek, A. & Kozłowski, M. (2020). The third stream as a new model of generating revenue for higher education institutions in Poland. *European Research Studies Journal*, 23(2), 260–270.
- Piwowar, H., Priem, J., Larivière, V., Alperin, J. P., Matthias, L., Norlander, B., Farley, A., West, J. & Haustein, S. (2018). The state of OA: a large-scale analysis of the prevalence and impact of Open Access articles. *PeerJ*, 6, 4375–4398.
- Pophaley, M. & Vyas, R. K. (2010). Optimizing maintenance management efforts by the application of TOC: A case study. *IUP Journal of Operations Management*, 9(3), 48.
- Prentice, A., E. (1996). *Financial planning for libraries* (2nd ed., Vol. 25). Metuchen: Scarecrow Press.
- Pretorius, P. (2014). Introducing in-between decision points to TOC's five focusing steps. *International Journal of Production Research*, 52(2), 496–506.

- Prosek, E. A. & Gibson, D. M. (2021). Promoting rigorous research by examining lived experiences: A review of four qualitative traditions. *Journal of Counseling & Development*, 99(2), 167–177.
- Pylarinou, S. (2014). Austerity and hospital library operation. *Journal of Hospital Librarianship*, 14(4), 356–365.
- Rafiq, M., Batool, S. H., Ali, A. F. & Ullah, M. (2021). University libraries response to COVID-19 pandemic: a developing country perspective. *The journal of Academic Librarianship*, 47(1), 102280-102284.
- Rahman, S. (2002). The theory of constraints' thinking process approach to developing strategies in supply chains. *International Journal of Physical Distribution and Logistics Management*, 32(10), 809–828.
- Rajan, S. S., Esmail, M. & Musthafa, M. (2022). Repositioning Academic Libraries as a Hub of technology enhanced learning space: Innovations and Challenges. *Library Philosophy and Practice*, 1–14.
- Ramirez, J., Ro, K., Lin, Y., Thomas, A., De Nysschen, M., Smart, A. & Robinson, G. (2022). Exploring alternative forms of scholarship for nurse educators' success. *Journal of Professional Nursing*, 43, 68–73.
- Ravitch, S. M. & Carl, N. M. (2016). *Qualitative research: Bridging the conceptual, theoretical and methodological*. Los Angeles: Sage.
- Raz, T., Barnes, R. & Dvir, D. (2003). A critical look at critical chain project management. *Project Management Journal*, 34(4), 24–32.
- Rehman, A. A. & Alharthi, K. (2016). An introduction to research paradigms. *International Journal of Educational Investigations*, 3(8), 51–59.
- Reich, V. (2000). What do librarians want? *Freedom of Information Conference Transcript*.
- Reid, R. A. (2007). Applying the TOC five-step focusing process in the service sector: A banking subsystem. *Managing Service Quality: An International Journal*, 17(2), 209–234.
- Reid, R. A. & Shoemaker, T. E. (2006). Using the Theory of Constraints to focus organizational improvement efforts: Part 1—defining the problem. *Journal-American Water Works Association*, 98(7), 63–75.
- Ricketts, J. A. (2007). *Reaching the goal: How managers improve a services business using Goldratt's Theory of Constraints*. Upper Saddle River: IBM Press.
- Ritterbush, J. (2012). Trials by Juries: Suggested practices for database trials. *Journal of Electronic Resources Librarianship*, 24(3), 240–243.

- Riyami, T. A. I. (2015). Main approaches to educational research. *International Journal of Innovation and Research in Education Sciences*, 2(5), 2349–5219.
- Robinson, C. J. & Ginder, A. P. (2020). *Implementing TPM: The North American Experience*. New York: Productivity Press.
- Ronen, B., Gur, R. & Pass, S. (1994). Focused management in military organizations: An avenue for future industrial engineering. *Computers and Industrial Engineering*, 27(1–4), 543–544.
- Ronen, B., Pliskin, J. S. & Pass, S. (2012). *Focused operations management for health services organizations*. San Francisco: John Wiley & Sons.
- Ross, L. & Technical Information Service. (2008). *Budgeting*. (Topic Gateway Series No. 27). Retrieved from http://www.cimaglobal.com/Documents/ImportedDocuments/cig_tg_budgeting_mar08.pdf. Accessed 12 April 2016.
- Rowley, J. (2012). Conducting research interviews. *Management Research Review*, 35(3/4), 260–271.
- Saarijärvi, M. & Bratt, E.-L. (2021). When face-to-face interviews are not possible: Tips and tricks for video, telephone, online chat, and email interviews in qualitative research. *European Journal of Cardiovascular Nursing*, 20(4), 392–396.
- Sabela, S. W. (2012). *An evaluation of the most prevalent budgeting practice in the South African business community*. [Masters Thesis]. University of Pretoria.
- Sanjika, T. (2010). *An overview of the Theory of Constraints and related literature*. Retrieved from <https://pdfs.semanticscholar.org/4349/d387e154c891f9c01b4b5088587e6d016c5f.pdf>. Accessed 13 April 2018.
- Schimmer, R., Geschuhn, K. K. & Vogler, A. (2015). *Disrupting the subscription journals' business model for the necessary large-scale transformation to open access*. Retrieved from https://pure.mpg.de/pubman/faces/ViewItemOverviewPage.jsp?itemId=item_2148961. Accessed 10 October 2022.
- Schneider, R. A. (2018). *Declaration of rights and principles to transform scholarly communication*. [Personal communication].
- Scholarly Publishing and Academic Resources Coalition. (2019). *Big deal cancellation tracking*. Retrieved from <https://sparcopen.org/our-work/big-deal-cancellation-tracking/>. Accessed 12 November 2022.

- Schram, T. H. (2006). *Conceptualizing and proposing qualitative research*. (2nd ed.). Upper Saddle River: Pearson Merrill Prentice Hall.
- Science and Technology: Will journal publishers perish? (2000). *The Economist*, 355(8170), 81–82.
- Scoggin, J. M., Segelhorst, R. J. & Reid, R. A. (2003). Applying the TOC thinking process in manufacturing: A case study. *International Journal of Production Research*, 41(4), 767–797.
- Scott, P. & Cotton, A. P. (2020). The sanitation cityscape toward a conceptual framework for integrated and citywide urban sanitation. *Frontiers in Environmental Science*, 8(70), 1–9.
- Shaturaev, J. (2022). Bad management hypotheses are demolishing management practices. *Архив Научных Исследований*, 2(1), 1–21.
- Shepherd, J., Petrillo, L. & Wilson, A. (2018). Settling in: How newcomers use a public library. *Library Management*, 39(8/9), 583–596.
- Shulenburger, D. E. (1999). Moving with dispatch to resolve the scholarly communication crisis: From here to NEAR. *The Association of Research Libraries*, 133, 2–3.
- Siha, S. (1999). A classified model for applying the theory of constraints to service organizations. *Managing Service Quality: An International Journal*, 9(4), 255–264.
- Simatupang, T. M., Wright, A. C. & Sridharan, R. (2004). Applying the theory of constraints to supply chain collaboration. *Supply Chain Management: An International Journal*, 9(1), 57–70.
- Simsit, Z. T., Gunay, N. S. & Vayvay, O. A. (2014). Theory of constraints: A literature review. *Procedia Social and Behavioral Sciences*, 150, 930–936.
- Sinclair, M. (2007). A guide to understanding theoretical and conceptual frameworks. *Evidence Based Midwifery*, 5(2), 39.
- Sinha, R., Tucker, C. & Scherlen, A. (2005). Finding the delicate balance: Serials assessment at the University of Nevada, Las Vegas. *Serials Review*, 31(2), 120–124.
- Sjoberg, C. (2017). E-journals and the big deal: A review of the literature. *School of Information Student Research Journal*, 6(2).
- Society of College, National and University Libraries. (2016). *The value of academic libraries*. Retrieved from <http://www.sconul.ac.uk/page/the-value-of-academic-libraries>. Accessed 20 March 2016.
- Somers, S. W. (1988). Boyer. *Library Acquisitions: Practice and Theory*, 12(2), 177–180.
- Song, D.-W. (2021). What is research? *WMU Journal of Maritime Affairs*, 20(4), 407–411.

- South African National Library and Information Consortium. (2017). *SANLiC 2017 Annual report* (p. 16). SANLiC.
- Spector, Y. (2011). Theory of constraints methodology where the constraint is the business model. *International Journal of Production Research*, 49(11), 3387–3394.
- Srikanth, M. L. & Robertson, S. A. (1995). *Measurements for effective decision making: A guide for manufacturing companies*. Karachi: Spectrum Publishing Company.
- Stenbacka, C. (2001). Qualitative research requires quality concepts of its own. *Management Decision*, 39(7), 551–556.
- Steven, G. (2007). Management accounting performance evaluation: Activity-based budgeting. *Financial Management*, 48–53.
- Stewart, D. (2011). *Difference between conceptual and theoretical framework*. Retrieved from http://www.ehow.com/info_8769890_difference-between-conceptual-theoretical-framework. Accessed 13 February 2019.
- Strauch, K. (2003). *Charleston Conference Proceedings 2001*. Westport: ABC-CLIO.
- Strauss, A. & Corbin, J. (1990). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. (Vol. 15). California: Sage.
- Suber, P. (2012). *Open access*. Cambridge: The MIT Press.
- Sullivan, J. R. (2012). Skype: An appropriate method of data collection for qualitative interviews? *The Hilltop Review*, 6(1), 10.
- Suver, J. & Brown, R. L. (1977). Where does Zero-Base Budgeting work. *Harvard Business Review*, 55(6), 76–84.
- Svicevic, M. (2015). Law and justice: Reviewing positive law in post-apartheid South Africa. *Africa Policy Journal*, 11, 20.
- Sweeney, L. J. (1999). Confronting crisis: The importance of measuring the use of paper journals in academic libraries. *New Library World*, 100(2), 72–79.
- Taherdoost, H. (2016). Sampling methods in research methodology; how to choose a sampling technique for research. *International Journal of Academic Research in Management*, 5(2), 18–27.
- Tamber, P. S. (2000). Is scholarly publishing becoming a monopoly? It seems to be, but scientific culture must take part of the blame. *BioMed Central News and Views*, 1(1), 5-.
- Tapfuma, M. M. & Hoskins, R. G. (2019). Open science disrupting the status quo in academic libraries — A perspective of Zimbabwe. *The Journal of Academic Librarianship*, 45(4), 406–412.

- The Hong Kong Polytechnic University. (2011). *Strategic Plan 2013/14 to 2017/18: Pao Yue-Kong Library*. Retrieved from <https://www.lib.polyu.edu.hk/pdf/library-strategic-plan-1314-to-1718.pdf>. Accessed 21 March 2016.
- Thorne, S. (2000). Data analysis in qualitative research. *Evidence Based Nursing*, 3(3), 68–70.
- Tise, E. & Truran, G. (2019). *Unbuckling the subscription model: A South African perspective*. UCT-SPARC Africa Open Access Symposium 2019, Cape Town.
- Trading Economics. (2018). *South African Rand 1972-2018 Data Chart Calendar Forecast News*. Retrieved from <https://tradingeconomics.com/south-africa/currency>. Accessed 20 April 2018.
- Trail, M. A. (2013). Evolving with the faculty to face library budget cuts. *The Serials Librarian*, 65(2), 213–220.
- Tripathi, A. & Lal, J. (2016). *Library consortia: Practical guide for library managers*. Amsterdam: Elsevier.
- UKZN research policy V: research ethics. (2007). *UKZN research policy V: research ethics*. Retrieved from <https://www.ukzn.ac.za/search-site/?q=ethical+policy>, Accessed 18 July 2018.
- Uloma, R. (2020). Impediment to acquisition of library resources in academic library in developing nations: Issues and prospects. *Jewel Journal of Librarianship*, 15(2), 129-143.
- Umble, M., Umble, E. & Murakami, S. (2006). Implementing theory of constraints in a traditional Japanese manufacturing environment: The case of Hitachi Tool Engineering. *International Journal of Production Research*, 44(10), 1863–1880.
- Ungvarsky, J. (2019). Nonprobability sampling. In *Salem Press Encyclopedia*. California: Salem Press.
- Universities South Africa. (2016). *Universities funding in South Africa: A fact sheet*. Retrieved from https://www.uct.ac.za/usr/news/downloads/2016/UniversitiesFundingSouthAfrica_FactSheet.pdf. Accessed 08 October 2022.
- University of California Office of the President. (2019). *UC terminates subscriptions with world's largest scientific publisher in push for open access to publicly funded research*. University of California. Retrieved from <https://www.universityofcalifornia.edu/press-room/uc-terminates-subscriptions-worlds-largest-scientific-publisher-push-open-access-publicly>. Accessed 13 June 2019.

- University of California, San Francisco Library Help Center. (2020). *Alternative access: How to get the PDF?* Retrieved from <http://ucsflibrary.zendesk.com/hc/en-us/articles/360020884753>. Accessed 16 June 2020.
- University of Cape Town, University of KwaZulu-Natal, & University of the Witwatersrand. (2006). *A new model for research support: Integrating skills, scholarship, and technology in a South African library consortium—Proposal for the Carnegie Corporation of New York, Cape Town*.
- University of Pretoria. (2008). *The research libraries consortium (RLC) project*. Retrieved from http://www.library.up.ac.za/research_commons/rlc.htm. Accessed 02 June 2016.
- Urs, S. R. (2012). *Staying Relevant: Why and how libraries must reposition in the digital era*. UBD Conference on GenNEXT Libraries, Brunei.
- Varpio, L., Ajjawi, R., Monrouxe, L. V., O'Brien, B. C. & Rees, C. E. (2017). Shedding the cobra effect: Problematising thematic emergence, triangulation, saturation and member checking. *Medical Education*, 51(1), 40–50.
- Virginia Polytechnic Institute and State University Libraries. (2020). *Alternative access to articles*. Retrieved from https://lib.vt.edu/content/lib_vt_edu/en/oa-big-deal/alt-access.html. 16 June 2020.
- Vorne. (2011, 2018). *Focus improvement on the manufacturing constraint | lean production*. Retrieved from <https://www.leanproduction.com/theory-of-constraints.html>. Accessed 20 January 2019.
- Wacker, J. G. (1998). A definition of theory: Research guidelines for different theory-building research methods in operations management. *Journal of Operations Management*, 16(4), 361–385.
- Wahyuni, D. (2012). The research design maze: Understanding paradigms, cases, methods and methodologies. *Journal of Applied Management Accounting Research*, 10(1), 69–80.
- Walker, D. (2003). *Funding policies in the university libraries: Report presented to the university planning and resources committee*. Durban: University of Natal, Research Office.
- Walker 11, T, L. (2022). *Librarians in an austerity environment*. [PhD Thesis]. Marshall University.
- Walliman, N. (2011). *Your research project: Designing and planning your work*. New York: Sage.
- Walshaw, M. (2015). *Planning your postgraduate research*. New York: Macmillan International Higher Education.

- Warner, A. & Sizer. (1992). *Owning your numbers: An introduction to budgeting for special libraries*. Washington, DC: Special Libraries Association.
- Watson, K. J., Blackstone, J. H. & Gardiner, S. C. (2007). The evolution of a management philosophy: The theory of constraints. *Journal of Operations Management*, 25(2), 387–402.
- Weicher, M. & Zhang, T. X. (2012). Unbundling the “big deal” with pay-per-view of e-journal articles. *Serials Librarian*, 63(1), 28–37.
- Weir, R. O. (2010). Trimming the library materials budget: Communication and preparation as key elements. *Serials Review*, 36(3), 147–151.
- Weir, R. O. & Ireland, A. (2011). The effect of transactional access/pay-per-view implementation on interlibrary loan: The case of Murray State University. *Interlending and Document Supply*, 39(1), 40–44.
- Wellington, J. & Szczerbinski, M. (2007). *Research methods for the social sciences*. London: Continuum.
- Wentzel, A. (2018). Sweden stands up for open access – cancels agreement with Elsevier. *OpenAccess.Se*. Retrieved from <http://openaccess.blogg.kb.se/2018/05/16/sweden-stands-up-for-open-access-cancels-agreement-with-elsevier/>. Accessed 17 May 2018.
- What is Austerity? - Economics Help*. (n.d.). Economics Help. Retrieved from <https://www.economicshelp.org/blog/6254/economics/what-is-austerity/>. Accessed 19 July, 2019.
- White, J. H. (2021). “It was never enough”: The meaning of nurses’ experiences caring for patients during the COVID-19 pandemic. *Issues in Mental Health Nursing*, 42(12), 1084–1094.
- Wild, S. (2016). *University Libraries hard hit by depreciating rand*. Retrieved from <http://mg.co.za/article/2016-01-21-university-libraries-hit-hard-by-depreciating-rand>. Accessed 22 July 2019.
- Willemsse, J. (2005). Library funding: Adequate financial support for African university funding. *South African Journal of Libraries and Information Science*, 71(2), 64.
- Willinsky, J. (2016). Scholarly associations and the economic viability of open access publishing. Retrieved from <https://demo.publicknowledgeproject.org/ojs3/demo/index.php/health-sciences/article/view/693>. Accessed 19 October 2022.

- Wilson, J. (2023). *Transformative agreements: Making universal access to research a reality*. IOP Publishing. Retrieved from <https://iopublishing.org/news/transformative-agreements-making-universal-access-to-research-a-reality/>. Accessed 17 March 2023.
- Wright, D. (2017). *Barely anyone blocks Sci Hub & barely anyone in university libraries believes it should be blocked—V interesting show of hands #UKSG17*. [Tweet]. Twitter. Retrieved from <https://twitter.com/DWUnabridged/status/851371293073063938>. Accessed 18 November 2022.
- Wyly, B. J. (1998). Competition in scholarly publishing? What publisher profits reveal. Retrieved from [https://scholar.google.co.za/scholar?q=Wyly,+B.+J.+\(1998\).+Competition+in+scholarly+publishing%3F+What+publisher+profits+reveal&hl=en&as_sdt=0&as_vis=1&oi=scholar](https://scholar.google.co.za/scholar?q=Wyly,+B.+J.+(1998).+Competition+in+scholarly+publishing%3F+What+publisher+profits+reveal&hl=en&as_sdt=0&as_vis=1&oi=scholar). Accessed 03 April 2019.
- Yakubu, B. (2023). Collection development policy: a panacea for collection development challenges in university libraries in Africa. *Ghana library journal*, 28 (1), 15-25.
- Yamma, M. & Molloy, B. (2021). The lucrative library fraud. *Internal Auditor*, 78(1), 20–22.
- Yin, R. K. (2018). *Case study research and applications: Design and methods*. (6th ed.). California: Sage.
- Yuan, W., Van Ballegoie, M. & Robertson, J. L. (2018). Ebooks versus print books: Format preferences in an academic library. *Collection Management*, 43(1), 28–48.
- Zach, L. (2002). A librarian's guide to speaking the business language. *Information Outlook*, 6(6), 18–24.
- Zamzam, S. M., Abdel-Aziz, M., Atef, A., Abdel-Naseer, U., Hamoda, M., Salah, M., Dewidar, H., Elsharkawy, L., Fawzy, M. & Shabana, M. (2022). Study designs and research methodology in the field of otolaryngology. *The Egyptian Journal of Otolaryngology*, 38(1), 1–5.

APPENDICES

Appendix 1: University of Cape Town ethical clearance letter



Humanities Postgraduate and Research Office
University of Cape Town
Humanities Faculty Research Ethics Committee

Room 112, Level 1, Beattie Building
Private Bag X3 Rondebosch 7701
Tel: +27 (0) 21 406 6365
E-mail: masnoenah.kamalle@uct.ac.za

01 June 2020

Ref. NO.: HUM202005-02

Mrs. Chiratidzo Chatikobo
School of Social Sciences
University of Kwazulu Natal
Pietermaritzburg Campus
Durban
4041

Dear Mrs. Chiratidzo Chatikobo,

RE: Ethical Clearance for Research Project

We are pleased to inform you that ethical clearance has been granted by an Ethics Review Committee of the Faculty of Humanities for your PhD project titled: *Investigating the optimization of South African University Library budgets in an austerity environment*.

The UCT FREC grants this permission with following condition attached:

Careful language editing of the Informed Consent forms is suggested, to create a more professional impression. The inclusion of information about how confidentiality of data and anonymity of participants will be assured, is recommended;

We wish you all the best with your study.

Yours sincerely,

A black rectangular box redacting the signature of the sender.

Associate Professor Tanja Bosch
Acting Chair, Humanities Faculty Research Ethics Committee

Appendix 2: University of KwaZulu-Natal ethical approval



15 October 2020

Mrs Chiratidzo Nyadzai Chatikobo (217080668)
School Of Social Sciences
Pietermaritzburg Campus

Dear Mrs Chatikobo,

Protocol reference number: HSS/0368/019D

Project title: Investigating the optimization of South African University Library budgets in an austerity environment

Approval Notification – Expedited Application

This letter serves to notify you that your application received on 12 April 2019 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL**

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. **PLEASE NOTE:** Research data should be securely stored in the discipline/department for a period of 5 years.

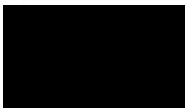
This approval is valid until 15 October 2021.

To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

All research conducted during the COVID-19 period must adhere to the national and UKZN guidelines.

HSSREC is registered with the South African National Research Ethics Council (REC-040414-040).

Yours sincerely,



Professor Dipane Hlalele (Chair)

/dd

Humanities & Social Sciences Research Ethics Committee
UKZN Research Ethics Office Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Tel: +27 31 260 8350 / 4557 / 3587
Website: <http://research.ukzn.ac.za/Research-Ethics/>

Founding Campuses: ■ Edgewood ■ Howard College ■ Medical School ■ Pietermaritzburg ■ Westville

INSPIRING GREATNESS

Appendix 3: University of Pretoria ethical approval



19 May 2020

Dear Mrs CN Chatikobo

Project Title: Investigating the optimization of South African University library budgets in an austerity environment.
Researcher: Mrs CN Chatikobo
Supervisor:
Department: External department
Reference number: 18208850 (HUM004/0320)
Degree: Doctoral

I have pleasure in informing you that the above application was approved by the Research Ethics Committee on 19 May 2020. Data collection may therefore commence.

Please note that this approval is based on the assumption that the research will be carried out along the lines laid out in the proposal. Should the actual research depart significantly from the proposed research, it will be necessary to apply for a new research approval and ethical clearance.

We wish you success with the project.

Sincerely,



Prof Innocent Pikirayi
Deputy Dean: Postgraduate Studies and Research Ethics
Faculty of Humanities
UNIVERSITY OF PRETORIA
e-mail: PGHumanities@up.ac.za

Fakulteit Geesteswetenskappe
Lefapha la Bomotheo

Research Ethics Committee Members: Prof I Pikirayi (Deputy Dean); Prof KL Harris; Mr A Bous; Dr A-M de Beer; Dr A dus Santos; Ms KT Govender; Andrew; Dr P Guluza; Dr E Johnson; Prof D Maree; Mr A Mohamed; Dr I Ncube; Dr C Rutterdill; Prof D Rensburg; Prof M Soeg; Prof E Talat; Prof V Thebe; Ms B Tsaba; Ms D Mckalapa

Appendix 4: University of the Witwatersrand ethical approval



OFFICE OF THE DEPUTY REGISTRAR

16 February 2021

Chiratidzo Chatikobo
PhD Library and Information Studies
University of Kwa-Zulu Natal

TO WHOM IT MAY CONCERN

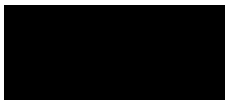
“Investigating the optimization of South African University library budgets in an austerity environment.”

This letter serves to confirm that the above project has received permission to be conducted on University premises, and/or involving staff and/or students of the University as research participants. In undertaking this research, you agree to abide by all University regulations for conducting research on campus and to respect participants' rights to withdraw from participation at any time.

If you are conducting research on certain student cohorts, year groups or courses within specific Schools and within the teaching term, permission must be sought from Heads of School or individual academics.

Ethical clearance has been obtained. Protocol number: (HSS/0368/19D)

Research Commencement: (As per the guidelines outlined by Senior Librarian – Ms Nina Lewin)



Nicoleen Potgieter
University Deputy Registrar

Appendix 5: University of Johannesburg ethical approval



22 February 2021

Chiratidzo Chatikobo (student # 217080668)
University of KwaZulu-Natal

Dear Chiratidzo Chatikobo

**PERMISSION TO CONDUCT RESEARCH AT THE UNIVERSITY OF
JOHANNESBURG**

The request for the project titled *Investigating the optimization of South African University library budgets in an austerity environment* refers. Permission is granted to conduct this study at the University of Johannesburg.

Sincerely



Dr Carol Nonkwelo
Executive Director: Research and Innovation
Email: cnonkwelo@uj.ac.za

Appendix 6: Rhodes University ethical approval



Human Ethics Sub-Committee
Rhodes University Ethical Standards Committee
PO Box 94, Makhanda, 6149 South Africa
Email: ethics-committee@ru.ac.za

www.ru.ac.za/research/research/ethics
NHREC Registration No. REC-241114-045

21st September 2020

Ms Chiratidzo Nyadzai Chatikobo
School of Social Sciences
University of Kwazulu Natal
Pietermaritzburg Campus
Rhodes University Reference number: 2020/RU11

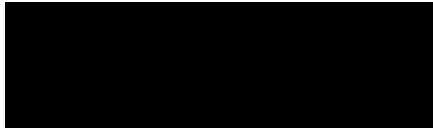
Dear Ms Chatikobo

Re: Protocol Ref: HSS/0368/019D for the PhD thesis: "Investigating the Optimization of South African University Library Budgets in an Austerity Environment".

This letter confirms that the above research proposal has been reviewed and **APPROVAL** as permission/gatekeeper letter from the Human Resources Director has been granted.

Please ensure that the Ethical Standards Committee is notified should any substantive change(s) be made, for whatever reason, during the research process.

Sincerely,



Prof Arthur Webb
Chair: Human Ethics Committee, RU-HEC
cc: *Mr. Siyanda Manqele – Ethics Coordinator*

Appendix 7: Stellenbosch University ethical approval



UNIVERSITEIT STELLENBOSCH UNIVERSITY
jou kennisvennoot your knowledge partner

INSTITUTIONAL PERMISSION:

AGREEMENT ON USE OF PERSONAL INFORMATION IN RESEARCH

Name of Researcher: Chiratidzo Chatikobo

Name of Research Project: Investigating the optimization of South African University Library budgets in an austerity environment.

Service Desk ID: IRPSD-1641

Date of Issue: 25 February 2020

The researcher has received institutional permission to proceed with this project as stipulated in the institutional permission application and within the conditions set out in this agreement.

1 WHAT THIS AGREEMENT IS ABOUT	
What is POPI?	<p>1.1 POPI is the Protection of Personal Information Act 4 of 2013.</p> <p>1.2 POPI regulates the entire information life cycle from collection, through use and storage and even the destruction of personal information.</p>
Why is this important to us?	<p>1.3 Even though POPI is important, it is not the primary motivation for this agreement. The privacy of our students and employees are important to us. We want to ensure that no research project poses any risks to their privacy.</p> <p>1.4 However, you are required to familiarise yourself with, and comply with POPI in its entirety.</p>

<p>What is considered to be personal information?</p>	<p>1.5 'Personal information' means information relating to an identifiable, living, individual or company, including, but not limited to:</p> <p>1.5.1 information relating to the race, gender, sex, pregnancy, marital status, national, ethnic or social origin, colour, sexual orientation, age, physical or mental health, well-being, disability, religion, conscience, belief, culture, language and birth of the person;</p> <p>1.5.2 information relating to the education or the medical, financial, criminal or employment history of the person;</p>
	<p>1.5.3 any identifying number, symbol, e-mail address, physical address, telephone number, location information, online identifier or other particular assignment to the person;</p> <p>1.5.4 the biometric information of the person;</p> <p>1.5.5 the personal opinions, views or preferences of the person;</p> <p>1.5.6 correspondence sent by the person that is implicitly or explicitly of a private or confidential nature or further correspondence that would reveal the contents of the original correspondence;</p> <p>1.5.7 the views or opinions of another individual about the person; and</p> <p>1.5.8 the name of the person if it appears with other personal information relating to the person or if the disclosure of the name itself would reveal information about the person.</p>

<p>Some personal information is more sensitive.</p>	<p>1.6 Some personal information is considered to be sensitive either because:</p> <p>1.6.1 POPI has classified it as sensitive;</p> <p>1.6.2 if the information is disclosed it can be used to defraud someone; or</p> <p>1.6.3 the disclosure of the information will be embarrassing for the research subject.</p> <p>1.7 The following personal information is considered particularly sensitive:</p> <p>1.7.1 Religious or philosophical beliefs;</p> <p>1.7.2 race or ethnic origin;</p> <p>1.7.3 trade union membership;</p> <p>1.7.4 political persuasion;</p> <p>1.7.5 health and health related documentation such as medical scheme documentation;</p> <p>1.7.6 sex life;</p> <p>1.7.7 biometric information;</p> <p>1.7.8 criminal behaviour;</p> <p>1.7.9 personal information of children under the age of 18;</p> <p>1.7.10 financial information such as banking details, details relating to financial</p>
	<p>products such as insurance, pension funds or other investments.</p> <p>1.8 You may make use of this type of information, but must take extra care to ensure that you comply with the rest of the rules in this document.</p>
<p>2 COMMITMENT TO ETHICAL AND LEGAL RESEARCH PRACTICES</p>	
<p>You must commit to the use of ethical and legal research practices.</p>	<p>2.1 You must obtain ethical clearance before commencing with this study.</p> <p>2.2 You commit to only employing ethical and legal research practices.</p>
<p>You must protect the privacy of your research subjects.</p>	<p>2.3 You undertake to protect the privacy of the research subjects throughout the project.</p>
<p>3 RESEARCH SUBJECT PARTICIPATION</p>	

<p>Personal information of identifiable research subjects must not be used without their consent.</p>	<p>3.1 Unless you have obtained a specific exemption for your research project, consent must be obtained in writing from the research subject, before their personal information is gathered.</p>
<p>Research subjects must be able to withdraw from the research project.</p>	<p>3.2 Research subjects must always be able to withdraw from the research project (without any negative consequences) and to insist that you destroy their personal information.</p>
<p>Consent must be specific and informed.</p>	<p>3.3 Unless you have obtained a specific exemption for your research project, the consent must be specific and informed. Before giving consent, the research subject must be informed in writing of:</p> <p>3.3.1 The purpose of the research,</p> <p>3.3.2 what personal information about them will be collected (particularly sensitive personal information),</p> <p>3.3.3 how the personal information will be collected (if not directly from them),</p> <p>3.3.4 the specific purposes for which the personal information will be used,</p> <p>3.3.5 what participation will entail (i.e. what the research subject will have to do),</p> <p>3.3.6 whether the supply of the personal information is voluntary or mandatory for purposes of the research project,</p>
	<p>3.3.7 who the personal information will be shared with,</p> <p>3.3.8 how the personal information will be published,</p> <p>3.3.9 the risks to participation (if any),</p> <p>3.3.10 their rights to access, correct or object to the use of their personal information,</p> <p>3.3.11 their right to withdraw from the research project, and</p> <p>3.3.12 how these rights can be exercised.</p>
<p>Consent must be voluntary.</p>	<p>3.4 Participation in the research project must always be voluntary. You must never pressure or coerce research subjects into participating and persons who choose not to participate must not be penalised.</p>

Using the personal information of children?	<p>3.5 A child is anybody under the age of 18.</p> <p>3.6 Unless you have obtained a specific exemption in writing for your research project, you must obtain</p> <p>3.6.1 the consent of the child’s parent or guardian, and</p> <p>3.6.2 if the child is over the age of 7, the assent of the child, before collecting the child’s information.</p>
Research subjects have a right to access.	3.7 Research subjects have the right to access their personal information, obtain confirmation of what information is in your possession and who had access to the information. It is strongly recommended that you keep detailed records of access to the information.
Research subjects have a right to object.	<p>3.8 Research subjects have the right to object to the use of their personal information.</p> <p>3.9 Once they have objected, you are not permitted to use the personal information until the dispute has been resolved.</p>
4 COLLECTING PERSONAL INFORMATION	
Only collect what is necessary.	4.1 You must not collect unnecessary or irrelevant personal information from research subjects.
Only collect accurate personal information.	4.2 You have an obligation to ensure that the personal information you collect is accurate. Particularly when you are collecting it from a source other than the
	<p>research subject.</p> <p>4.3 If you have any reason to doubt the quality of the personal information you must verify or validate the personal information before you use it.</p>
5 USING PERSONAL INFORMATION	
Only use the personal information for the purpose for which you collected it.	<p>5.1 Only use the personal information for the purpose for which you collected it.</p> <p>5.2 If your research project requires you to use the personal information for a materially different purpose than the one communicated to the research subject, you must inform the research subjects and Stellenbosch University of this and give participants the option to withdraw from the research project.</p>

<p>Be careful when you share personal information.</p>	<p>5.3 Never share personal information with third parties without making sure that they will also follow these rules.</p> <p>5.4 Always conclude a non-disclosure agreement with the third parties.</p> <p>5.5 Ensure that you transfer the personal information securely.</p>
<p>Personal information must be anonymous whenever possible.</p>	<p>5.6 If the research subject's identity is not relevant for the aims of the research project, the personal information must not be identifiable. In other words, the personal information must be anonymous (de-identified).</p>
<p>Pseudonyms must be used whenever possible.</p>	<p>5.7 If the research subject's identity is relevant for the aims of the research project or is required to co-ordinate, for example, interviews, names and other identifiers such as ID or student numbers must be collected and stored separately from the rest of the research data and research publications. In other words, only you must be able to identify the research subject.</p>
<p>Publication of research</p>	<p>5.8 The identity of your research subjects should not be revealed in any publication.</p> <p>5.9 In the event that your research project requires that the identity of your research subjects must be revealed, you must apply for an exemption from this rule.</p>
<p>6 SECURING PERSONAL INFORMATION</p>	
<p>You are responsible for the confidentiality and security of the personal information</p>	<p>6.1 Information must always be handled in the strictest confidence.</p> <p>6.2 You must ensure the integrity and security of the information in your possession or under your control by taking appropriate and reasonable technical and organisational measures to prevent:</p>

	<p>6.2.1 Loss of, damage to or unauthorised destruction of information; and</p> <p>6.2.2 unlawful access to or processing of information.</p> <p>6.3 This means that you must take reasonable measures to:</p> <p>6.3.1 Identify all reasonably foreseeable internal and external risks to personal information in your possession or under your control;</p> <p>6.3.2 establish and maintain appropriate safeguards against the risks identified;</p> <p>6.3.3 regularly verify that the safeguards are effectively implemented; and</p> <p>6.3.4 ensure that the safeguards are continually updated in response to new risks or deficiencies in previously implemented safeguards.</p>
Sensitive personal information requires extra care.	6.4 You will be expected to implement additional controls in order to secure sensitive personal information.
Are you sending any personal information overseas?	<p>6.5 If you are sending personal information overseas, you have to make sure that:</p> <p>6.5.1 The information will be protected by the laws of that country;</p> <p>6.5.2 the company or institution to who you are sending have agreed to keep the information confidential, secure and to not use it for any other purpose; or</p> <p>6.5.3 get the specific and informed consent of the research subject to send the information to a country which does not have data protection laws.</p>
Be careful when you use cloud storage.	<p>6.6 Be careful when storing personal information in a cloud. Many clouds are hosted on servers outside of South Africa in countries that do not protect personal information to the same extent as South Africa. The primary example of this is the United States.</p> <p>6.7 It is strongly recommended that you use hosting companies who house their servers in South Africa.</p> <p>6.8 If this is not possible, you must ensure that the hosting company agrees to protect the personal information to the same extent as South Africa.</p>
7 RETENTION AND DESTRUCTION OF PERSONAL INFORMATION	
You are not entitled to retain personal information when you no longer need it for the purposes	7.1 Personal information must not be retained beyond the purpose of the research project, unless you have a legal or other justification for retaining the information.

of the research project.	
If personal information is retained, you must make sure it remains confidential.	<p>7.2 If you do need to retain the personal information, you must assess whether:</p> <p>7.2.1 The records can be de-identified; and/or whether</p> <p>7.2.2 you have to keep all the personal information.</p> <p>7.3 You must ensure that the personal information which you retain remains confidential, secure and is only used for the purposes for which it was collected.</p>
8 INFORMATION BREACH PROCEDURE	
In the event of an information breach you must notify us immediately.	<p>8.1 If there are reasonable grounds to believe that the personal information in your possession or under your control has been accessed by any unauthorised person or has been disclosed, you must notify us immediately.</p> <p>8.2 We will notify the research subjects in order to enable them to take measures to contain the impact of the breach.</p>
This is the procedure you must follow.	<p>8.3 You must follow the following procedure:</p> <p>8.3.1 Contact the Division for Institutional Research and Planning at 021 808 9385 and permission@sun.ac.za;</p> <p>8.3.2 you will then be required to complete the information breach report form which is attached as Annexure A.</p> <p>8.4 You are required to inform us of a information breach within 24 hours. Ensure that you have access to the required information.</p>
9 MONITORING	
You may be audited.	<p>9.1 We reserve the right to audit your research practices to assess whether you are complying with this agreement.</p> <p>9.2 You are required to give your full co-operation during the auditing process.</p> <p>9.3 We may also request to review:</p> <p>9.3.1 Forms (or other information gathering methods) and notifications to research subjects, as referred to in clause 3;</p> <p>9.3.2 non-disclosure agreements with third parties with whom the personal information is being shared, as referred to in clause 5.4;</p>

	9.3.3 agreements with foreign companies or institutes with whom the personal information is being shared, as referred to in clause 6.5.
10 CHANGES TO RESEARCH	
You need to notify us if any aspect of your collection or use of personal information changes.	<p>10.1 You must notify us in writing if any aspect of your collection or use of personal information changes (e.g. such as your research methodology, recruitment strategy or the purpose for which you use the research).</p> <p>10.2 We may review and require amendments to the proposed changes to ensure compliance with this agreement.</p> <p>10.3 The notification must be sent to permission@sun.ac.za.</p>
11 CONSEQUENCES OF BREACH	
What are the consequences of breaching this agreement?	<p>11.1 If you do not comply with this agreement, we may take disciplinary action or report such a breach to your home institute.</p> <p>11.2 You may be found guilty of research misconduct and may be censured in accordance with Stellenbosch University or your home institute's disciplinary code.</p>
You may have to compensate us in the event of any legal action.	<p>11.3 Non-compliance with this agreement could also lead to claims against Stellenbosch University in terms of POPI and/or other laws.</p> <p>11.4 Unless you are employed by or studying at Stellenbosch University, you indemnify Stellenbosch University against any claims (including all legal fees) from research subjects or any regulatory authority which are the result of your research project. You may also be held liable for the harm to our reputation should there be an information breach as a result of your non-compliance with this agreement.</p>
12 CONTACT US	
Please contact us if you have any questions.	Should you have any questions relating to this agreement you should contact permission@sun.ac.za .

Annexure 'A'

Instruction:

Please send this Notice to permission@sun.ac.za. If you have any difficulty completing the Notice, please contact the Division for Institutional Research and Planning at 021 808 9385. You must confirm that the Notice was

NOTIFICATION OF INFORMATION BREACH

Name of Researcher: _____

Name of Research Project: _____

Service Desk ID: _____

A security breach happens when you know (or you **reasonably believe**) that there has been:

- (a) loss of Personal Information (“PI”)
- (b) damage to PI
- (c) unauthorised destruction of PI
- (d) unauthorised access to PI
- (e) unauthorised processing of PI

Date and time of security breach:	
Brief description of the security breach (what was lost and how). Please identify the equipment, software and/or physical premises and whether it is by hacking, lost device, public disclosure (email), theft or other means:	
Name of the person/s responsible for the security breach (if known):	
Is the security breach ongoing?	
Describe the steps taken to contain the security breach:	
What steps are being taken to investigate the cause of breach?	

Appendix 8 : Informed consent letter



School of Social Sciences
College of Humanities
Private Bag X01
Scottsville, 3209
Pietermaritzburg
01 October 2018

Dear Respondent

INVITATION TO PARTICIPATE IN AN INTERVIEW

I, Chiratidzo N. Chatikobo, a student at the University of KwaZulu-Natal (UKZN), kindly invite you to participate in an interview for the study entitled **“Investigating the optimization of South African University library budgets in an austerity environment”**.

I am undertaking this study through the UKZN Information Studies Department as part of the PhD requirements. This study aims to investigate how libraries are managing their austerity budgets. It is envisaged that this study, using the Theory of Constraints (TOC), will help in foregrounding other possible solutions.

Participation in this study is voluntary. You may refuse to participate or withdraw from the study at any stage and for any reason without any negative or undesirable consequences. There is no monetary gain from participating in this study. For confidentiality and anonymity of participants, data collected will be put into categories so that participants are not referred to as individuals. Kindly note that it should take about 20 minutes to complete the interview.

If you have any questions or concerns about participating in this study, please feel free to contact my supervisor or me using the details below.

Thank you for participating, I appreciate.

Yours sincerely

Chiratidzo N. Chatikobo (**Researcher**)

Mobile number: [REDACTED]

Email address: [REDACTED] or
217080668@stu.ukzn.ac.za

Supervisor: Professor Ruth Hoskins

Information Studies

School of Social Sciences

University of KwaZulu-Natal

Email address: hoskinsr@ukzn.ac.za

033 260 5093

HSSREC Research Office: Ms P Ximba

University of KwaZulu-Natal

+27 (0)31 260 3587

Email address: ximbap@ukzn.ac.za

Please complete this form

Title of study “Investigating the optimization of South African University Library budgets in an austerity environment”.

I....., hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participate in the research project as outlined in the document about the study.

I....., hereby consent/do not consent to have this interview recorded.

I acknowledge that I have been informed of the purpose of this survey. I am aware that participation in the study is voluntary and I understand that I am at liberty to withdraw from the project at any time, should I so desire.

Participant

Signature

Date:

Email:

WhatsApp number.....Skype Address.....

Researcher

Signature

Date:

Email:

Appendix 9: Request for permission to conduct research



University of KwaZulu-Natal
School of Social Sciences
College of Humanities
Private Bag X01
Scottsville, 3209
Pietermaritzburg

01 October 2018

The Registrar

Stellenbosch University

Private Bag X1

Matieland, 7602

South African

Dear Sir / Madam

RE: REQUEST FOR PERMISSION TO UNDERTAKE RESEARCH

My name is Chiratidzo N. Chatikobo, a PhD (Information Studies) student in the School of Social Sciences, College of Humanities at the University of KwaZulu-Natal, Pietermaritzburg Campus, South Africa.

As part of my doctoral studies, I am undertaking research on “investigating the optimisation of South African University Library budgets in an austerity environment”. My supervisor is Professor Ruth Hoskins. Face to face, Skype and WhatsApp interviews will be the methods of gathering data on the extent of the austerity budgets in the selected libraries.

Library resource cancellations have been the solution for budget constraints for years now. It is envisaged that this study, using the Theory of Constraints (TOC), will help in foregrounding other

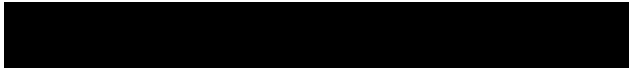
possible solutions. The findings of the study may also reduce if not stop the current shrinking of library resources.

The purpose of this letter is to request permission to interview relevant participants from your institution and to access library annual reports for 2014 to 2018. I also request access to any other documents within your institution that could assist this research as guided/directed by the participants. I intend to collect data during June to December 2020. The data collected will be treated with confidentiality and anonymity. I shall be very grateful for your assistance and I appreciate your cooperation in advance.

Yours sincerely,

Chiratidzo N. Chatikobo (217080668)

Email address:



Appendix 10: Semi-structured interview guide for the DVC:R



School of Social Sciences

College of Humanities

Private Bag X01

Scottsville, 3209

Pietermaritzburg

01 October 2018

For the DVC Research.

Topic: Investigating the optimization of South African university library budgets in an austerity environment.

1. What budgeting strategy do you use?
Probing: How helpful is your budgeting strategy in an austerity environment?
What criterion do you use to allocate the library budget?
2. Tell me about the challenges associated with the budget constraints.
Probing: On Universities, academics, students and librarians.
3. The Theory of Constraints (TOC) is based on the idea that any company has identifiable constraints.
Probing: Do you think austerity budgets are the only constraints causing shrinking of library resources?
In your view, what other constraints exist?
Describe what you regard as a major constraint and give reasons why?
4. How do you exploit the constraints?
Probing: Internally – Inside the Library and the University.
Externally – Outside the University e.g. government, publishers etc.
5. How do you adjust the internal and external systems to support the mitigation of the constraints?
6. How can universities and academics help in mitigating the constraints?
7. How do you evaluate the improvement of the constraint?
8. In your view, who has the power to change the status quo?

Note. This guide will be used in the interviews, while allowing investigation of the topics not covered in the guide but raised by the respondents.

Appendix 11: Semi-structured interview guide for Librarians



School of Social Sciences
College of Humanities
Private Bag X01
Scottsville, 3209
Pietermaritzburg
01 October 2018

For Library Directors/Deputy Directors, Manager: Information Resources, e-Resources librarians, Research librarians, Scholarly Communication Librarian and Serials librarians and their equivalent.

Topic: Investigating the optimization of South African university library budgets in an austerity environment.

1. Tell me about your Library budget allocations trends as from 2014 to date?
2. Tell me about your library collection in terms of growth and meeting user needs?
Probing: In your view are the library resources shrinking or not?
3. Tell me about the challenges associated with the budget constraints.
Probing: On University, academics, students and librarians.
4. The Theory of Constraints (TOC) is based on the idea that any company has identifiable constraints.
Probing: Do you think austerity budgets are the only constraints causing shrinking of library resources?
In your view, what other constraints exist?
Describe what you regard as a major constraint and give reasons why?
5. How do you exploit the constraints?
Probing: Internally – Inside the Library and the University.
Externally – Outside the University e.g., government, publishers etc.
6. How do you adjust the internal and external systems to support the mitigation of the constraints?
7. How do you evaluate the improvement of the constraint?
8. In your view, who has the power to change the status quo?

Note. This guide will be used in the interviews, while allowing investigation of the topics not covered in the guide but raised by the respondents.

Appendix 12: Proof of editing letter

Great Zimbabwe University

Department of Curriculum Studies

P O Box 1235

Masvingo

Zimbabwe

20 November 2023

Email: mareva@gzu.ac.zw/ marevarugare@gmail.com

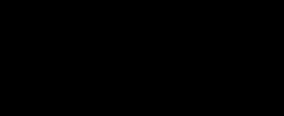
Cell: +263 772 978 970

TO WHOM IT MAY CONCERN

Re: Proof of Editing CHIRATIDZO N. CHATIKOBO'S DOCTORAL THESIS

This is to certify that I, Prof. Rugare Mareva (National Identity Number 22-101 400 K 22), have edited CHIRATIDZO N. CHATIKOBO's doctoral thesis titled: *'INVESTIGATING THE OPTIMISATION OF SOUTH AFRICAN UNIVERSITY LIBRARY BUDGETS IN AN AUSTERITY ENVIRONMENT'*, to be submitted to the University of KwaZulu-Natal. Any errors and omissions are inadvertent. I am a holder of a PhD (English) (University of Venda), M.Ed (English) (University of Zimbabwe), B.Ed (English) (University of Zimbabwe), and a Certificate in Education (English Major) (Gweru Teachers' College).

Thank you.



Prof. Rugare Mareva (PhD), Language Editor: Policy Documents, Journal Articles, Book chapters, Books, Reports, Projects, Dissertations and Doctoral Theses. Great Zimbabwe University, Department of Curriculum Studies, Masvingo, Zimbabwe